



# Wildlife

of Colorado National Monument



Photo from *Through the Eyes of the Children*  
by Diane Hirschinger Gallegos and Tope Elementary Students



# The Value of Empty Space

BACKGROUND FOR  
TEACHERS

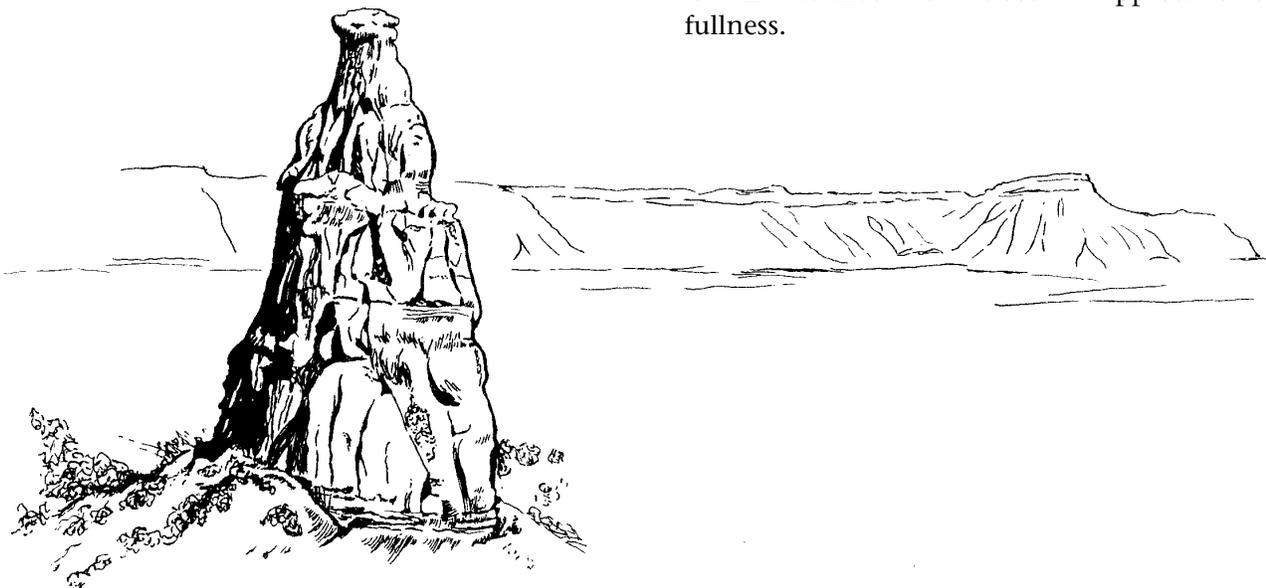
Television, videos, magazines, and books have brought marvelous imagery and stories about nature into our homes. Zoos and wild animal parks give us close-up views of creatures that we would not normally have the chance to see. As a result, people go to parks and want to capture that excitement and intimacy for themselves. More often, only “empty” space is found. With “nothing going on,” they become disillusioned, noisy, and consequently, their own worst enemy.

Empty space is not all that it appears. Numerous dramas are unfolding, yet neither at the speed nor at the level that the humans expect. A harvester ant struggles with a seed twice its body weight, slowly hauling it back to its colony. Clinging to the branch of a juniper tree, a large carpenter bee extends its orange wings to warm itself in the early morning sun. A white butterfly with black speckles on its wings, a Becker’s white, flutters above a rabbitbrush, where it lands, extends its tube-like proboscis, and begins to sip nectar from the yellow blossoms. Nearly invisible next to a

rock, a jumping spider watches and waits as a small fly walks closer and closer to it. Curled up in its underground burrow, a kangaroo rat sleeps after a busy night of foraging for seeds and plants. A bushy-tailed woodrat completes the resealing of its nest after a piece of it broke off when rocks fell off the nearby cliff. Sitting motionless atop a clutch of five eggs, a canyon wren watches a faded midget rattlesnake slide across the sandstone below her nest. A yellow-headed collared lizard basks on a rock with the legs of the grasshopper it just caught still dangling from its mouth. Perfectly camouflaged in the shade of a boulder, a mountain lion gives itself a bath, slowly licking its back and legs.

This complex web of life may not be visible to a noisy group of children as they rush up the trail. They race past clues and signs of activity that these creatures left behind. The sounds of life going on around them are silenced by their loud voices and stomping footsteps. Only with a relaxed, quiet attitude, a slow to leisurely pace, with many stops to look and listen for signals from the community of rocks, soils, plants, and space around them, will students detect the inhabitants of these lands.

Indeed, there is no “empty” space. Rather it is **WE** who must work to see and appreciate its fullness.



# The Ten Most Wanted List



## ◆ Desert bighorn sheep

*These animals top most visitors' lists of wildlife to see at Colorado National Monument. Yet the likelihood of seeing them is small. What are the reasons for this?*

## ◆ Mountain lion

## ◆ Bobcat

## ◆ Coyote

## ◆ Kit fox

## ◆ Ringtail

## ◆ Mule deer

## ◆ Peregrine falcon

## ◆ Bald eagle

## ◆ Golden eagle

First, while a bird or mammal may be near the trail, they are not as easy to see as you might expect having visited zoos or wildlife parks. Wild animals are busy with daily life: they must seek out food, water, shelter, breed, raise young, and above all, not become food for something else. Their drive to survive may take them throughout their territory, which may be feet, acres, or miles in size. While they may cross paths with you, it is by chance, not by intent. Still, with sharp eyes, a quiet step, and persistence, you may be lucky enough to spot the flick of a mule deer's ear as it chews its cud in the shade of a tall shrub. Or you may hear the call of a peregrine falcon as it flies high above the canyons chasing off a golden eagle. Movement in a bunch of Indian rice grass may clue you in to a desert cottontail nibbling on a stem.

Another reason why these "Top Ten" are hard to find is that they are shy of humans. Many wild animals freeze, hide, or run at the sight, sound, or smell of people. Desert bighorn sheep, mountain lions, and bobcats tend to avoid areas that we inhabit or visit. Even though wildlife populations may be high in a given area, your very presence can send them undercover. While you do not consider yourself to be a threat, birds and animals see you as danger because of your size, noise, movement, and difference from them.

# The Ten Most Wanted List



The time of day and weather also make a difference in wildlife watching. Many birds, for example, feed early, in the cool hours of the morning. By 10:00 AM, they are difficult to spot resting in the shade of a tree. Finding turkey vultures, on the other hand, is best in the growing heat of the day. They await rising columns of hot air (known as thermals) to carry them in their search for dead animals on which to feed. Other creatures have different preferences for temperature. Reptiles need external heat to raise their body temperatures to a level optimal for digestion. On a cool morning, or in the deep shade, you may not see any lizards. Later, as the day heats up, they seem to be everywhere, basking on rocks to warm themselves, or darting after spiders and flies. As temperatures peak in the afternoon, reptiles return to the shade of bushes, shrubs, rock crevices, and underground burrows to avoid overheating. Thus, to find wildlife, you need to know something about the animal you want to see in order to time your search with the times when it is most likely to be active.

Predators, such as golden eagles and peregrine falcons, have keen eyesight to help them locate food. They are active during the daytime, or **diurnal**. Since the hours of dawn and dusk are the best for spotting mule deer, foxes, and owls, these creatures are called **crepuscular**. Active at night are the **nocturnal** hunters, ringtails and bobcats. Bats are supremely adapted to nighttime activity, relying on their echo-location capabilities to capture beetles, mosquitoes, and other insects for food. Planning your schedule to correspond with those of the wildlife that you want to see will help you to find them.

Seasons also make a difference when looking for wildlife. Many species of birds leave the region during the colder winter months. Because their food is unavailable, they migrate southward in search of better conditions. While chances of seeing a peregrine falcon diminish in winter, opportunities for seeing bald eagles increase. After nesting in the northern part of the United States, Canada, and Alaska, bald eagles come southward to warmer climates. Some venture along the Colorado River and into parts of the Colorado National Monument. Reptiles and some rodents enter a period of hibernation, or become inactive, during the cold months, and are not seen. Yet deer, elk, and bighorn sheep watching may improve as herds from higher elevations come lower to have better access to food. Some of the best wildlife watching occurs when animal tracks and signs of activity are recorded in winter snows.

Successful wildlife watching involves looking in the right place at the right time. An appreciation of the natural history of the creature also helps the viewer to locate it. You will not find a mule deer up on a canyon wall, nor will you spot a desert bighorn sheep in a backyard nibbling grass. Plan to go to where the animal you want to see lives. Learning about its survival needs and habitat preferences in advance of a field trip will give you a better chance of discovering it.

# The Ten Most Wanted List



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## Creatures Most Likely To Be Seen

### November – February

- Common raven
- Dark-eyed junco
- House finch
- Black-capped chickadee
- Mountain chickadee
- Black-billed magpie
- Mule deer (tracks)
- Pinyon and scrub jays
- Desert cottontail

### March – October

- Common raven
- Turkey vulture
- Pinyon and scrub jays
- Swifts and swallows
- Desert cottontail
- Rock squirrel
- Least chipmunk
- Yellow-headed collared lizard
- Northern sagebrush lizard
- Gnats, bees, flies, spiders

# Finding Wildlife in the Monument: A Trail by Trail Guide



*Colorado National Monument has an abundance of wildlife within its canyons and on its mesas. The guide below lists trails together with birds, reptiles, and mammals that are most likely to be seen along them. The list is divided into three parts: the **West Side**, including areas closer to the Fruita entrance; the **East Side**, including areas closer to the Grand Junction entrance; and **Rim Rock Drive**, which traverses the Colorado National Monument. Only the most common species are given. Wildlife listings by season or habitat are not provided. Even with this list, your luck in observing these creatures cannot be guaranteed. So many factors can influence your ability to spot wild animals and birds, including weather, time of day, season, breeding status, migratory patterns, territorial movement, and population fluctuations. Your own state of mind makes the biggest difference. By walking quietly; alone, or in a small group; and by taking **plenty of time** to stop, look, and listen, your chances of a rewarding view of wildlife are greater.*

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**West Side**

**Alcove Nature Trail, Canyon Rim Trail, Window Rock Trail and Visitor Center**

Desert cottontail, bushy-tailed woodrat, least chipmunk, rock squirrel, deer mouse, kangaroo rat, coyote, gray fox, skunk, mule deer, bats (many species), pinyon jay, scrub jay, black-billed magpie, raven, canyon wren, rock wren, Bewick's wren, turkey vulture, red-tailed hawk, golden eagle, peregrine falcon, American kestrel, white-throated swift, violet-green swallow, rock dove, mourning dove, common nighthawk, Say's phoebe, ash-throated flycatcher, western kingbird, plain titmouse, broad-tailed hummingbird, black-chinned hummingbird, yellow-rumped warbler, northern flicker, house finch, dark-eyed junco, chipping sparrow, lizards (many species), snakes (many species).

**Saddlehorn Campground and Picnic Area**

Desert cottontail, bushy-tailed woodrat, least chipmunk, rock squirrel, deer mouse, kangaroo rat, skunk, coyote, gray fox, bats (many species), pinyon jay, scrub jay, black-billed magpie, raven, golden eagle, red-tailed hawk, peregrine falcon, American kestrel, turkey vulture, white-throated swift, violet-green swallow, canyon wren, rock wren, Bewick's wren, rock dove, mourning dove, ruby-crowned kinglet, plain titmouse, bushtit, pine siskin, mountain chickadee, dark-eyed junco, house finch, common nighthawk, northern flicker, American robin, lizards (many species), snakes (many species).

# Finding Wildlife in the Monument: A Trail by Trail Guide

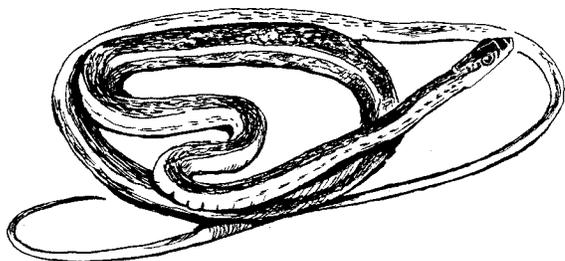


## Fruita Canyon

Desert bighorn sheep, mule deer, desert cottontail, black-tailed jackrabbit, bushy-tailed woodrat, Mexican woodrat, rock squirrel, least chipmunk, deer mouse, kangaroo rat, gray fox, kit fox, coyote, bobcat, mountain lion, bats (many species), golden eagle, peregrine falcon, American kestrel, red-tailed hawk, turkey vulture, raven, white-throated swift, violet-green swallow, rock dove, mourning dove, canyon wren, rock wren, Bewick's wren, Say's phoebe, ash-throated flycatcher, western kingbird, broad-tailed hummingbird, black-chinned hummingbird, dark-eyed junco, house finch, common nighthawk, northern flicker, American robin, lizards (many species), snakes (many species), amphibians (many species).

## Lower Monument Canyon

Mule deer, desert cottontail, black-tailed jackrabbit, coyote, gray fox, bobcat, mountain lion, rock squirrel, least chipmunk, bushy-tailed woodrat, Mexican woodrat, deer mouse, kangaroo rat, skunk, bats (many species), peregrine falcon, golden eagle, bald eagle, red-tailed hawk, American kestrel, raven, crow, turkey vulture, meadowlark, American robin, northern flicker, canyon wren, rock wren, Bewick's wren, white-throated swift, violet-green swallow, rock dove, mourning dove, scrub jay, pinyon jay, black-billed magpie, Say's phoebe, ash-throated flycatcher, western kingbird, broad-tailed hummingbird, black-chinned hummingbird, Gambel's quail, house finch, dark-eyed junco, black-throated sparrow, lizard (many species), snakes (many species), amphibians (many species).



## Otto's Trail

Desert cottontail, white-tailed jackrabbit, mule deer, mountain lion, bobcat, coyote, gray fox, rock squirrel, least chipmunk, ringtail, bushy-tailed woodrat, deer mouse, kangaroo rat, bats (many species), golden eagle, peregrine falcon, red-tailed hawk, American kestrel, turkey vulture, scrub jay, pinyon jay, black-billed magpie, raven, American robin, northern flicker, canyon wren, rock wren, Bewick's wren, white-throated swift, violet-green swallow, rock dove, mourning dove, plain titmouse, mountain chickadee, broad-tailed hummingbird, black-chinned hummingbird, house finch, dark-eyed junco, lizards (many species), snakes (many species).

## Upper Monument Canyon, Coke Ovens Trail

Mule deer, desert cottontail, white-tailed jack-rabbit, coyote, gray fox, kit fox, bobcat, mountain lion, ringtail, rock squirrel, least chipmunk, bush-tailed wood rat, Mexican woodrat, kangaroo rat, deer mouse, bats (many species), peregrine falcon, golden eagle, red-tailed hawk, American kestrel, raven, turkey vulture, American robin, northern flicker, black-throated sparrow, rufous-sided towhee, canyon wren, rock wren, Bewick's wren, house finch, dark-eyed junco, white-throated swift, violet-green swallow, plain titmouse, rock dove, mourning dove, scrub jay, pinyon jay, black-billed magpie, common nighthawk, Say's phoebe, ash-throated flycatcher, western kingbird, yellow-rumped warbler, broad-tailed hummingbird, black-chinned hummingbird, Gambel's quail, lizards (many species), snakes (many species), amphibians (many species).



# Finding Wildlife in the Monument: A Trail by Trail Guide



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**East Side**

## No Thoroughfare Canyon

Mule deer, desert cottontail, black-tailed jackrabbit, bushy-tailed woodrat, Mexican woodrat, least chipmunk, rock squirrel, deer mouse, kangaroo rat, skunk, coyote, gray fox, kit fox, bobcat, mountain lion, bats (many species), golden eagle, American kestrel, turkey vulture, red-tailed hawk, raven, Gambel's quail, canyon wren, rock wren, Bewick's wren, house finch, rosy finch, dark-eyed junco, black-throated sparrow, chipping sparrow, blue-gray gnatcatcher, ash-throated flycatcher, western kingbird, Say's phoebe, white-throated swift, violet-green swallow, rock dove, mourning dove, common nighthawk, broad-tailed hummingbird, black-chinned hummingbird, plain titmouse, mountain chickadee, black-capped chickadee, American robin, bushtit, lazuli bunting, lizards (many species), snakes (many species).

**Note:** No Thoroughfare Canyon, with its drainage and waterfalls, is home to a number of amphibians. That this canyon, which appears to be so harsh and dry, should be habitat for creatures whose survival and life cycle are so connected to water is remarkable. **Please, then, be very careful about where and how you walk while visiting this area. Remember, too, that sunscreen, lotions, and oils on your body can pollute these ephemeral waters.**

**From April to July, when frogs and toads use the creek and seasonal pools for breeding and egg laying, please do not disturb or enter the water! Give the next generation of amphibians a chance to hatch and grow up!**

## Devils Kitchen Picnic Area, Devils Kitchen Trail, Serpents Trail, Old Gordon Trail

Desert cottontail, bushy-tailed woodrat, Mexican woodrat, black-tailed jackrabbit, least chipmunk, rock squirrel, mule deer, bobcat, coyote, gray fox, kit fox, mountain lion, ring-tail, deer mouse, kangaroo rat, bats (many species), pinyon jay, scrub jay, black-billed magpie, turkey vulture, golden eagle, red-tailed hawk, American kestrel, raven, Gambel's quail, black-throated sparrow, house finch, rosy finch, canyon wren, rock wren, Bewick's wren, Say's phoebe, ash-throated flycatcher, western kingbird, plain titmouse, American robin, broad-tailed hummingbird, black-chinned hummingbird, plain titmouse, mountain bluebird, lizards (many species), snakes (many species), amphibians (many species).

## Rim Rock Drive

Desert bighorn sheep, mule deer, mountain lion, bobcat, gray fox, kit fox, coyote, ringtail, rock squirrel, least chipmunk, bushy-tailed woodrat, Mexican woodrat, skunk, deer mice, kangaroo rat, bats (many species), golden eagle, peregrine falcon, American kestrel, red-tailed hawk, turkey vulture, raven, canyon wren, rock wren, house finch, dark-eyed junco, black-throated sparrow, white-throated swift, violet-green swallow, mountain bluebird, rock dove, mourning dove, scrub jay, pinyon jay, northern flicker, western kingbird, Say's phoebe, ash-throated flycatcher, American robin, broad-tailed hummingbird, black-tailed hummingbird, lizards (many species), snakes (many species).

# Tips for Spotting Wildlife Along the Trail

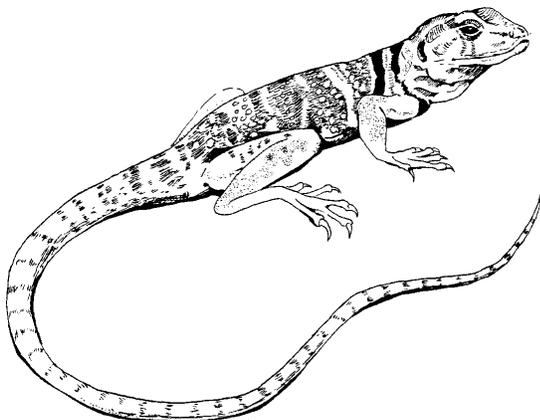


- ~ Dress to blend in with your environment.
- ~ Talk quietly — or not at all — on the trail.
- ~ Practice the skills of quiet walking, stalking, and using your peripheral view in order to “see” more in the environment around you.
- ~ Periodically stop and stand still for several minutes. Let your eyes roam, as new levels of activity reveal themselves.
- ~ Use your ears to locate sounds of wildlife along the way. Often the song of a bird, a rustling in the grass, or the clatter of hooves on gravel are your best clues that creatures are nearby.
- ~ Scout for good shelters or hiding spots near the trail. Also look closely around places where water or moisture has gathered.
- ~ Scan for tracks in dust, wet sand, and snow to indicate routes traveled by wildlife en route to shelter, water, or food. When two habitats come together, or where one type of plant life transitions to another, pay special attention. Called “ecotones”, these are rich places for wildlife to feed and live.
- ~ Look for scat.
- ~ Not all wildlife is at the surface. Check by rocks, dead trees, roots, branches, leaves, grass. For example, circular depressions in sandy areas beneath rock overhangs may be the hiding places of ant lions, while swellings on leaves or stems can hold eggs and larva of tiny wasps. If you pick up a rock, be sure to carefully replace it exactly as it was. It may be the roof or the shade prized by some small creature.
- ~ Remind students in advance of their field trip that if they do discover wildlife, they should remain still, not rush forward, and not attempt to capture them. Humans are VERY frightening for wild animals, and no one wants to scare or harm them accidentally. Besides, it is much more interesting to observe wild creatures in their own habitat, going about their daily activities, than to entrap them in a cage, terrarium, or hand. Be aware, many wild animals will bite, scratch, or kick if handled, and many more problems can result from that.
- ~ Plan your hike with the season, time of day, and temperature during which the wildlife that you want to see will be active. Early morning and evening are good times for wildlife watching. In the heat of the day, many animals, birds, and reptiles are not visible as they rest and stay cool in trees, shrubs, rock crevices, and other shelters.
- ~ If possible, preview the trail you will hike several days beforehand, and at approximately the same time of day as you will bring the class. Alone, and moving at your own pace, scout out nests, dens, places to see wildlife that you can then refer to with your group. This is particularly useful if the class does not see any wildlife. At least, you can create a tale about the lizard that was right here, just the other day.
- ~ Binoculars and a camera will enhance your views, and help to record your discoveries.
- ~ The leader must keep the group together and safe at all times. Students should not straggle along the trail, or run ahead of the leader. The pace should be that of the slowest member, thereby assuring that all students make the hike successfully. Either the teacher or a chaperone should be at the head of the line to do pathfinding. Another adult should be designated to be the last person along the trail to assure no one is left behind.
- ~ *Above all, remember that wildlife watching is not a fast-paced activity.* It should be undertaken with leisurely purpose, so as to experience as much as possible. Be aware that you are the visitor, and this is the home of wildlife. Treat them, and the land, with respect.

# Wildlife Biography: Lizards

BACKGROUND FOR  
TEACHERS

*Lizards are members of the Reptile Class, which also includes turtles, crocodiles, snakes — and dinosaurs! Of the 3750 known species of lizards found around the world, the majority live in warm places, such as rainforests and deserts. Some, however, live high in the mountains, and a few inhabit islands. In our region, approximately twenty different types of lizards are known. They may be seen climbing on rocks or trees, skittering across the soil, or basking in the sun.*



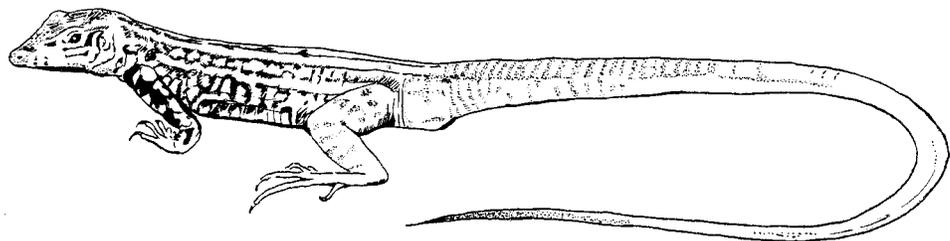
Regardless of their location, lizards have many features in common:

- ~ Their bodies are shaped like long, thin cylinders.
- ~ Their tails may be longer than their bodies, and are used for holding on to things, and for balance. Fat reserves are stored in the tail, which helps lizards to survive periods without food. Some species have weak zones in the vertebrae of their tails. This is a defense mechanism: when a predator attacks, the tail detaches quickly and keeps on wiggling independent of the body. The predator is distracted while the lizard escapes. Even though tails will regrow, the new ones are connected by cartilage only, and look different from the original one.
- ~ Most lizards have four legs, but several species have no legs. Legless lizards move much like snakes, and slither across the ground. In our area, the lizards all have four legs, with five toes, and claws for gripping. In sandy areas, the passage of lizards is marked by four footprints, topped by holes from the claws. Between the feet is a line left by the tail.
- ~ Scales, made of the same material as our fingernails, cover their bodies, and act as protection from the elements as well as from predators. The color of scales can vary tremendously, from the bright yellow and green of the yellow-headed collared lizard, to the mottled brown and grays of the well camouflaged sagebrush lizard. The arrangement, size, and shape of scales on lizards distinguishes them both from snakes and from each other.

# Wildlife Biography: Lizards



- ~ As lizards grow, they form a new covering of scales underneath the old. The old scales drop off in small pieces. This contrasts with snakes, which often shed their skin in a single, long piece. It is not possible to tell how old a lizard is by how many times it has shed its skin. A lizard's growth is influenced by temperature, and food availability and quantity. In times of plenty, a lizard grows more quickly than in times of scarcity.
- ~ The eyes of lizards are located on sides of their heads. This enables them to see up, down, and to the side at the same time, a very useful adaptation for spying potential food, approaching predators—or even school groups.
- ~ Lizards have ear holes on the sides of their heads. They can hear quite well, in addition to picking up vibrations through the ground or rocks where they are perched.
- ~ The teeth of lizards are sharp and shaped like cones, for use in catching, grasping, carrying, and killing their prey. Many lizards can — and will — bite if you try to pick them up.
- ~ Lizards, like other reptiles, do not regulate their body temperatures internally. They are “cold-blooded”. In order to warm up, they must absorb heat from their surroundings. This is why you will see lizards “basking” in the sun on rocks. When they get too hot, they retreat into the shade of tree roots and rock crevices to cool off. By moving around this way, they are able to maintain a nearly constant temperature.
- ~ Some lizard species defend a territory in which they feed, bask, and take shelter. When another lizard, or even a human, enters its space, the lizard will push up and down on its front legs. While this looks like the human equivalent of push-ups, for the lizard it is an effort to show dominance and appear formidable by moving aggressively. Some species flash their colorful sides, while others puff out their throats.
- ~ Lizards differ from amphibians by their combination of scales, ear holes, claws, and ability to survive away from water.



# Wildlife Biography: Lizards



## Lizards of Colorado National Monument

### Yellow-Headed Collared Lizard

**Body:** 4 to 5 inches long, with a tail that is up to ten inches long. This species is perhaps the most unusual looking creature in the Colorado National Monument, and certainly the brightest in color. It is also impressive in size. The head, chin, and toes are yellow, with a variety of brownish to blackish markings. The neck area has two wide black stripes that look like “collars”, and contrast with the underlying yellow tone. The back and tail of the lizard can be speckled green to brown to gray-green. The skin may look loose and wrinkled on the body. Insects, spiders, and other lizards are its food, which it captures by running fast, jumping, even standing up and balancing on its hind feet alone.

### Leopard Lizard

**Body:** 3 1/2 to 12 inches long, with a large head, and a tail at least as long as its body. The underlying color is gray to brownish. Numerous small spots and crossbars contrast with the rest of the body. Grasshoppers, crickets, beetles, spiders, small rodents, even other lizards are its food. Even though it is a fast runner, most often it lies in wait for its prey in the shade of a bunchgrass, shrub, or low plant. Pregnant females have an orange stomach.

### Eastern Fence Lizard

**Body:** 1 3/4 to 3 1/2 inches long, with a tail of the same length as the body. Beige to gray-brown in color, its back is marked with pale crossbars and chevron-like patches of dark brown, black and white. Its scales are quite coarse compared with other lizards. Common in the park, adult lizards have patches of sky blue color on the sides of their abdomens, and two separate patches on the sides of the throat. Found in a variety of habitats from under rocks, to rock crevices, to bunch grass, to small shrubs, it eats spiders, insects, millipedes, and, yes, be glad, ticks!

# Wildlife Biography: Lizards



## Northern Sagebrush Lizard

**Body:** 1 3/4 to 2 3/4 inches long, with a tail of the same length as the body. This lizard looks like an eastern fence lizard, but is clearly smaller, and has fewer scales on the neck and thigh areas. The scales appear to be more smooth than those of the fence lizard. The underlying color is gray-brown, with light and dark stripes on the back and sides. It feeds on small insects, spiders, even scorpions, that it catches on the ground.

## Western Whiptail

**Body:** 2 1/2 to 4 1/2 inches long, with a very long, thin tail that may be twice the body length. Whiptails are found in open or slickrock areas, with low shrubs, and occasionally near water. Scales are yellow to beige to brownish, with a speckly pattern on the back, fading to more of a checkerboard on the tail. The neck has distinctive folds of skin, and a large ear hole is visible. The hind legs are bigger than the front, and the toes are large and clawed. These lizards run in a jerky way with their tails “whipping” back and forth. Unlike other lizards, whiptails rove in search of prey, and do not defend a territory.

## Side-blotched Lizard

**Body:** 1 3/4 to 2 1/2 inches long, with tail of the same length of body. This brownish lizard has a characteristic blue-black patch on its side, just up behind the front leg. The rest of the patches or “blotches” are variable, from dark brown to gray to yellow and buff. Scales are smooth, and the neck has a fold of skin on it. This lizard is very common in sandy, rocky washes, near grass and shrubs. It spends most of its time on the ground, and eats insects, spiders, scorpions, and sowbugs!

## Plateau Striped Whiptail

**Body:** 2 1/2 to 3 3/4 inches long, with a very long, thin tail that may be twice the body length. Young of this species have a bright blue colored tail, which fades to pale blue in adults. Its dark brown to black back has six or seven stripes that run the length of its body. An interesting fact is that no males are known from this species of whiptail.

# Wildlife Biography: Mountain Lion



*Mountain lions, also known as pumas and cougars, live in mountainous areas, foothills, mesas, and canyons of the western United States. While Colorado National Monument is a likely place for them to be found, they are rarely spotted by visitors. One reason for this is that mountain lions are very secretive and solitary by nature. As predators, they capture their food using the element of stealth and surprise. If they do not want to be seen, you probably will not see them. Even though they grow to between six and eight feet in length, and can weigh between 100 (female) and 130 (male) pounds, hairs between the pads of their large feet act to cushion their passage, and help them to move silently. Colored brownish-red to tawny-beige on their backs, mountain lions are also well camouflaged on the desert soils and rocks. Their solid coloring gives them their Latin name, **Felis concolor**, or “cat of the same color”. Only movement of their dark-tipped tails, which may reach thirty inches in length, might give them away.*

Another reason you do not see mountain lions is that their territories extend from five to over thirty square miles. They have been reported to travel twenty-five miles in one night. Deer are their preferred food, although elk and small rodents will also be eaten. Once prey has been located, the mountain lion will hide and wait for the right moment to spring out for the kill. One deer will feed the lion for about a week. After gorging on the meat, the lion may hide the carcass under leaves and brush to save for later. Between feedings, the lion rests and stays well hidden. The combination of solitary, stealthy hunting behavior; long periods of rest; and a large territory makes it uncommon to cross paths with mountain lions.

In recent years, as more people have moved into the foothills, mountains, and rural parts of the of the west, stories of human-lion interactions have begun to circulate. Occasionally pets have disappeared mysteriously, lion tracks have been found close to homes, and lone persons on trails have been attacked. Some attacks on humans have been reported, often by young or yearling lions that have recently been sent from the company of their parent to live out on their own. These incidents are not the result of extra aggressive mountain lions. Rather they are the consequence of more human pressure and ventures into lands that were once the sole turf of these secretive cats. Who has more right to be there? And at what cost? These are hard questions, for which there may be no simple answer. No doubt such concerns will linger for years to come.

# Wildlife Biography: Mountain Lion



**If you come upon a mountain lion, some words of caution are in order.**

Contrary to previous advice that you may have heard, wildlife biologists from the Colorado Division of Wildlife now recommend the following procedure:

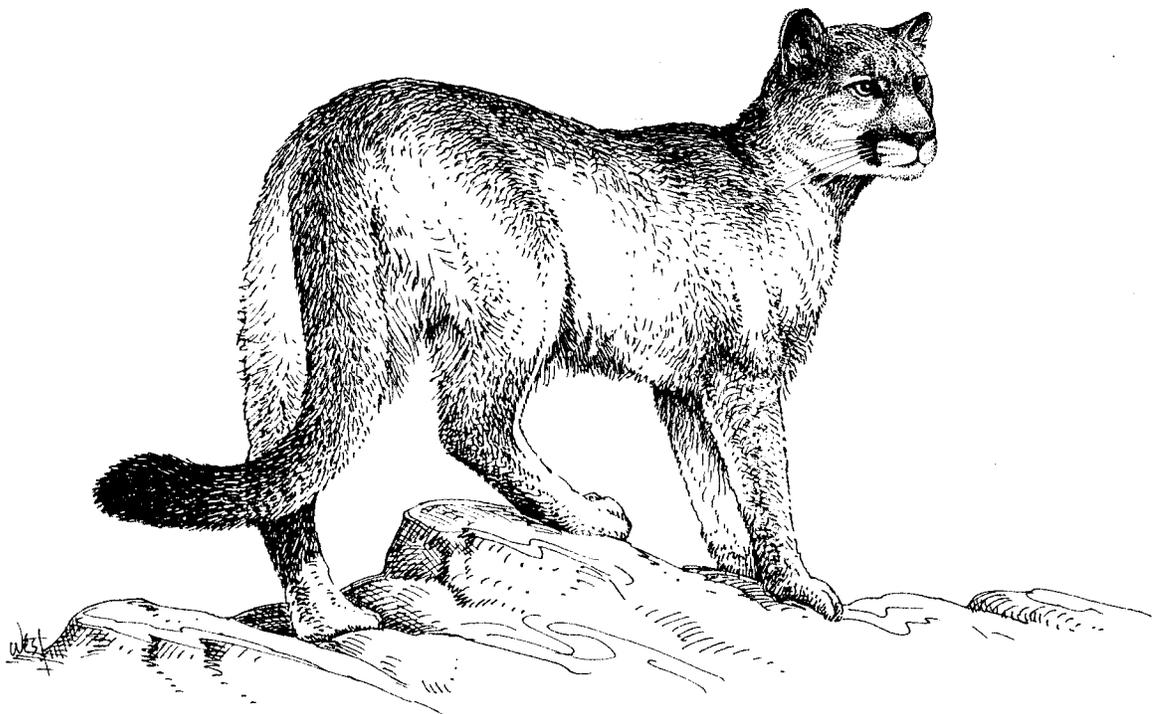
- ~ In areas where you think a lion might be, make a lot of noise, talk, or sing as you go. Your loudness may scare away the lion.
- ~ If you come upon a lion, **STAY CALM!** Talk to it firmly and with composure. Move slowly.
- ~ **Stop where you are, or BACK away slowly. ALWAYS FACE THE LION. DO NOT RUN!**
- ~ Raise your arms above your head to appear as large as possible. If you are carrying a backpack, lift it up above your head to seem even bigger. Your size may intimidate the lion.

~ If the lion behaves aggressively towards you, throw stones, branches, whatever you can get your hands on **without bending down or turning your back.**

~ If it does attack, **FIGHT BACK!** Lions can be driven away by your resistance.<sup>1</sup>

Other cautions apply as well. Always let someone know where you are going, and when you will be returning. Use your head, and be careful. Mountain lions do not have to be a source of fear, but as we humans extend the boundaries of our lives to increasingly overlap with the territories of lions, more encounters can be expected.

<sup>1</sup> Armstrong, D. *Lions, Ferrets, and Bears: A Guide to Mammals of Colorado*. Colorado Division of Wildlife pamphlet. p. 43.



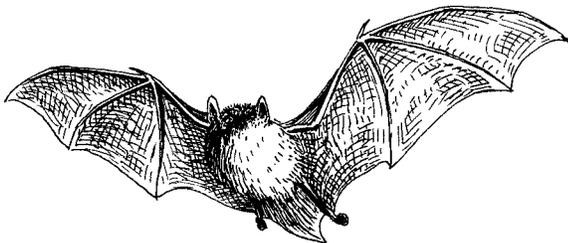
# Wildlife Biography: Bats



*Of the 1000 or more bats worldwide, seventeen kinds reside within Colorado. Seven species are known to inhabit the rock alcoves, crevices, and a variety of other shelters at Colorado National Monument. They are: little brown myotis, long-legged myotis, small-footed myotis, western pipistrelle, big brown bat, Townsend's big-eared bat, and pallid bat. These flying mammals have fascinating physical features that help them to flourish here and throughout the world.*

One of the most unique characteristics of bats is their ability to “see” well with little or no light. Many scientists have studied how bats, which are active at night, can find such small and moving objects as insects without running into anything. Although no one fully understands how they are such masters of the darkness, what is known is:

- ~ Bats have good eyesight, and can see well during the day or the night.
- ~ Bat can echo-locate. They have the ability to emit high frequency sounds, which bounce off an object and return to the bat with information about the object's location. This can be done on the wing as well as while perched.
- ~ Bats also have good hearing. Their large ears can gather sounds as tiny as an insect's footstep, and amplify them, which helps the bat to locate its prey.



Other physical features of interest are bats' wings. They are made of skin that stretches across their forearm to their elongated second through fifth fingers, and then goes to their back legs and tail. Outspread on the downbeat and retracted on the upbeat, these wings enable bats to swoop, sweep, dart, and flap through the air with remarkable precision and speed.

Also of interest is a bat's unusual ability to survive cold temperatures. Bats are most active during the warmer months of the year. In winter and when temperatures drop, they enter a type of torpor, or period of inactivity, lower respiration, heartbeat, and body temperature. In rock crevices, holes in trees, even recesses in people's homes, they survive on fat reserves that they develop during the warmer months. In the spring, they give birth to live young, which cling to the parents until they are old enough to take flight themselves.

In spite of these marvelous adaptations, and many benefits to humans and the environment, bats are still a source of fear, misinformation, and mythology. Some myths worth dispelling for students are:

- ~ **Bats are not blind.** Even though the ears are the more prominent feature on many bats, they do have eyes, and can see quite well.
- ~ **Bats do not fly into hair, or near you, for the purpose of harming you.** Bats are not really interested in humans. Rather they are interested in surviving, which may entail hunting for insects in the vicinity of people. Should they come near, it is most likely because lights around houses, porches, or buildings attract insects, their main source of food. In addition, bats' highly developed ability to echo-locate allows them to know that humans are much too big to eat. Thus, most bats want to stay away from you as much as you may want to stay away from them!

# Wildlife Biography: Bats

BACKGROUND FOR  
TEACHERS



*Small-footed myotis*

- ~ **Bats will not drink your blood.** Only one species of bat, the vampire bat, does drink blood, and that is from cows and other hoofed mammals. No vampire bats are known in the United States. Rather, they are found in Latin America. Local bats, such as the little brown myotis, have been estimated to eat as much as one-third of their body weight in thirty minutes.<sup>1</sup> Just imagine what a colony of bats does to the insect population in one night! We should appreciate one of the valuable functions that bats perform in nature, keeping the number of insects in balance.
- ~ **All bats do not carry rabies.** Even though all mammals are capable of being infected with rabies, they are not necessarily carriers of it. The same is true with bats. Less than one-half of one percent of all bats contract rabies, and those that do frequently die without causing any kind of harm. Many years ago, incorrect information about bats and rabies was widely publicized, creating this misconception. Many studies have since confirmed that bats pose no higher risk than other mammals for this disease.<sup>2</sup> Public health records show the odds of humans dying due to disease from bats to be much less than one in a million.<sup>3</sup> However, it must be noted that people should always be careful about touching any unknown animal, whether it be domestic or wild.

Fossils of bats have been found that date back over 50 million years ago. Thus, the enduring success of these unusual looking winged mammals speaks strongly for their importance in the environment. Tropical bats, which often feed on fruit, are considered critical to the pollination and seed dispersal of rainforest plants. Some crops, such as bananas, dates, figs, avocados, and mangoes depend almost entirely on bats for their survival. Locally, bats consume thousands of mosquitoes, moths, beetles, flies, gnats, and other insects, which helps to keep insect populations in check. Bats have established a unique niche for themselves, which helps them to survive in a diverse range of environments, from the rainforests of the tropics to the canyons and mesas of the Grand Valley.

Now, it is our turn to help bats. We must protect them from population declines due to habitat destruction, pesticide spraying, and unnecessary death due to misinformation. A specific act that school children can take is to build and hang bat houses. Kits for these simple to construct wooden structures are widely available, and numerous books about bats contain information on them as well. Local nurseries, garden centers, bird-feeding, toy, and nature supply stores may also carry information or plans for helping care for these flying marvels.

<sup>1</sup> Armstrong, D. *Lions, Ferrets, and Bears: A Guide to the Mammals of Colorado*. Colorado Division of Wildlife pamphlet. 1993. p. 9.

<sup>2</sup> Tuttle, M. *America's Neighborhood Bats*. University of Texas Press. Austin, Texas. 1988. p. 18-19.

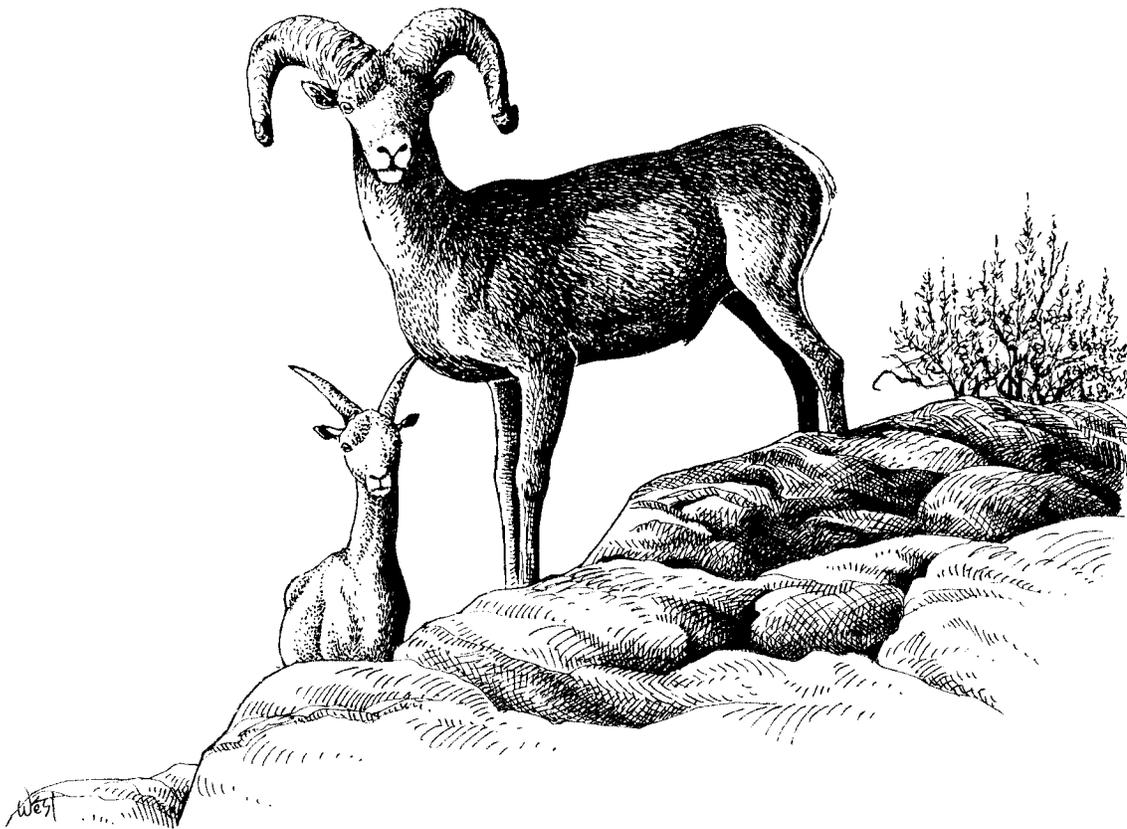
<sup>3</sup> Ibid. p. 24.

# Wildlife Biography: Bighorn Sheep

BACKGROUND FOR  
TEACHERS

Colorado is home to two species of bighorn sheep, the Rocky Mountain bighorn, and the desert bighorn. The state mammal is the Rocky Mountain bighorn, or *Ovis canadensis*. However, the desert bighorn resides at Colorado National Monument. Several small populations of these fascinating animals were introduced here from Nevada and Arizona between 1979 and 1981. These transplants have adapted to life in the canyons and mesas, and appear to be surviving in the local conditions. Frequenting rugged slopes and with only a sparse growth of trees, desert bighorns travel along the cliffs of the Wingate Formation, and the

talus slopes below. Some groups are also found on the slopes of the Kayenta Formation above the Wingate cliffs. In the winter, they are more often seen on south-facing canyon walls, while in the summer they linger on cooler north-facing walls. Springs, potholes, and sources of water may also be good places to see them in the early morning. Even if you were to approach the bighorns, because of their keen eyesight, they are likely to see you coming and quickly disappear. Nervous around humans, even other grazing animals, they prefer to live in isolation in remote areas and wilderness.



# Wildlife Biography: Bighorn Sheep



Part of the Bovidae Family, bighorn sheep are related to cows, sheep, goats, antelope, and bison. However, in looks and size, they more resemble deer. Bighorn sheep have brown to gray colored fur, pale abdomens, and cream-colored rumps. Standing 2 1/2 to 3 1/2 feet high, 5 to 6 feet long, and weighing 75 - 150 pounds (female), 125 - 275 pounds (male), they have a sturdy build. While deer have antlers that are shed and regrown each year, bighorn sheep have permanent horns that grow annual rings. On males, the horns form large 360 degree coils, which can weigh as much as ten percent of overall body weight. Female horns are much smaller, and arch back from the forehead in a quarter moon shape. Because male sheep can butt horns as part of the seasonal fall rut, their heads have specially developed cushions of spongy material to absorb the shock. Their crania, or skull bones, are also extra thick. Another unique feature of bighorn sheep is their hooves. The outer edge is rigid and stiff, whereas the inside is more soft and rubbery. This combination enhances both their traction and their balance, enabling them to make a living on the seemingly sheer canyon walls and talus slopes where little else competes with them for food.

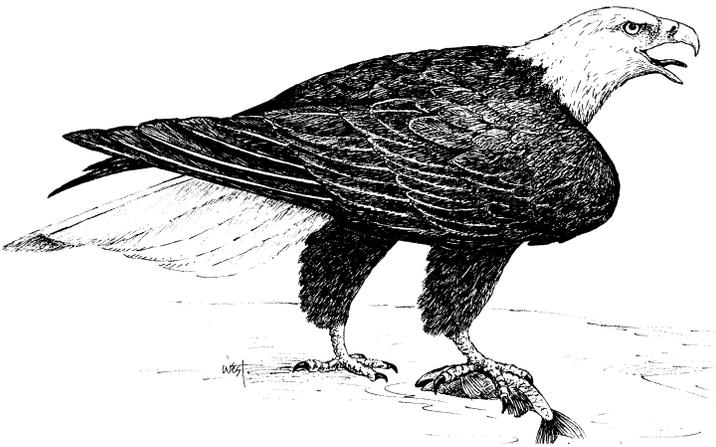
During the summer months, bighorn sheep often separate into male and female groupings, as they seek out sedges, grasses, and small plants for food. By fall the groups reunite, and the males may determine dominance through head butting. While that activity is one for which they are most famous, it does not occur that often. Where duels for harem control are common among elk and deer, this is not so in bighorns. Usually the ram with the biggest horns is dominant, and challenges to its position are few. Although the dominant male may mate, other males are also successful. Lambs are born six months later, when plants are at their greenest.

Look for these graceful, but shy, animals in Fruita Canyon.

# Wildlife Biography: Eagles

BACKGROUND FOR  
TEACHERS

*Colorado National Monument has two resident eagles: the bald eagle in the winter, and the golden eagle year-round. Both of these large birds of prey may be seen over the mesas and canyons. The golden eagle nests in the area.*



## Bald Eagles

Bald eagles are the second largest bird of prey in North America. Their wings extend out six to eight feet, and their 36 to 43 inch body can weigh up to twelve pounds. Only the California condor is larger. Its scientific name is "*Haliaeetus leucocephalus*", or "sea eagle with the white head". Its dramatic profile and contrasting black and white colors have made it one of our nation's symbols since 1872. Identifying features of this striking bird are:

~ **Large wings, and wing span.** Seen from below, eagle wings look like planks sticking out from the body. When soaring, the profile is flat, with the wings sticking straight out from the body. This differs from the turkey vulture, with whom it can be confused. Turkey vultures carry their wings tilted up in a V-shape. To gain elevation, the eagle flaps its wings heavily and slowly.

~ **Dark brown to black colored body and wings.** Mature eagles are a solid dark color on their entire body, except for the tail and head, which are white. Immatures may have patches of white on underwings, even a mottling of white on the body. Bald eagles do not reach adult plumage until four years of age, when the white head and tail become distinguishing features. As immatures, bald eagles are easily confused with adult golden eagles.

~ **Head is large in proportion to the body.** In addition, the beak, eyes, and feet are yellow in mature eagles. Immatures have a brownish beak, pale yellow eyes, and yellow feet. Legs are unfeathered in mature bald eagles, contrasting to mature golden eagles which have feathers to their toes.

~ **Commonly found along rivers, lakes, and coastal areas.** Because the bald eagle is primarily a fish eater, it is usually seen near water. Locally, look for bald eagles perched on cottonwood trees or dead snags along the Colorado, Gunnison, and Dolores Rivers.

Feeding habits of the bald eagle may take it far from water, and hence over the monument. On these forays, it will eat squirrels, prairie dogs, rabbits, muskrats, and waterfowl. Occasionally it may be found alongside highways and roads scavenging road kill. While bald eagles are found across much of the United States, they visit the Grand Valley region most often in winter, and head north for nesting in the spring and summer. Bald eagles are protected under federal and state laws (as they are on the Endangered Species List). They were given this protection when their numbers declined due to hunting and poaching; disturbance at nest sites; loss of nesting trees and habitat; and pollution of their food by pesticides and lead shot that caused thinning of egg shells and lack of reproductive success. With federal protection, bald eagle populations have stabilized, and even increased in some parts of the country.

# Wildlife Biography: Eagles



BACKGROUND FOR  
TEACHERS



## Golden Eagles

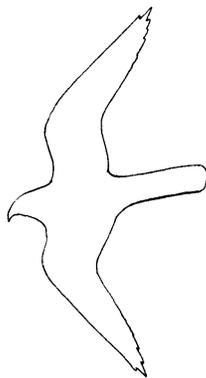
Golden eagles differ from bald eagles in three ways. First, they are not fish eagles, and frequent drier places that may be far from water. Mesas, plains, cliffs, desert, grassland, even mountainous areas are their preferred habitat. They are year-round residents of this region. A second difference is in looks. Not only is the golden smaller in size, with a wingspan of 6 to 7 1/2 feet, and a body weight of 8 to 12 pounds, but its colors are not the same. The mature golden eagle has dark brown feathers over its entire body and wings, with a small patch of white periodically visible at the base of the tail. Only in good light and up close may the golden feathers at the nape of the neck be seen. Confusion between immature golden eagles and adult bald eagles occurs because of tail and wing feathers. Immature goldens have a bright band of white followed by a band of black at end of the tail. This small amount of white reminds watchers of the entirely white tail of the mature bald eagle. Causing further confusion is that both immature golden and

bald eagles may have patches of white at the base of their feathers that create a dappling effect.

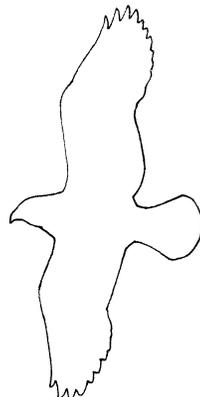
Rabbits are the preferred food of golden eagles, with prairie dogs, ground squirrels, marmots, and snakes also being taken. Skunks and birds of prey are also consumed. Little evidence has been found to support the contention that livestock is at risk from golden eagles. Nesting takes place throughout western Colorado from March to June. Cliff ledges and alcoves with open areas below for hunting are preferred. The same nest, or nesting area, may be used again and again.

For school groups doing wildlife observations or bird studies, care should be taken in identification of large birds of prey over Colorado National Monument. In addition to the challenges of identifying bald and golden eagles, it may be difficult to identify red-tailed hawks and turkey vultures from a distance. Therefore, before you shout that you have spotted a bald eagle, pay attention to the following things: what season it is; the bird's proximity to water; the size of its wings and wingspan; the profile of its wings (flat versus tilted upwards); the feathering on its legs; and, lastly, the location of white on its head, tail, and underside of wings.

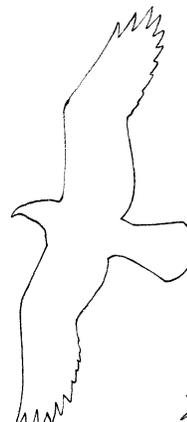
vaptor recognition guide



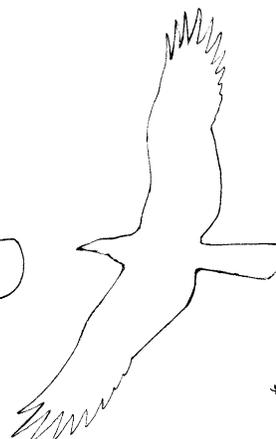
falcon (kestrel,  
peregrine)



buteo  
(red-tailed hawk)



eagle



vulture



eagle soars  
flat-winged

turkey vulture soars  
with up-tilted wings

# Wildlife Biography: Peregrine Falcon

BACKGROUND FOR  
TEACHERS

*Peregrine falcons are among Colorado's biggest celebrity wildlife. Not only have they been on federal and state Endangered Species Lists, but thanks to the dedicated work of the Peregrine Fund and agencies like the Colorado Division of Wildlife, peregrine falcons are making a comeback! With captive breeding programs, careful manipulation, and reintroduction efforts, the number of these magnificent fliers is recovering from a 1972 low. Now, wild peregrine falcons return to Colorado National Monument annually to nest and raise their young. If you are lucky, you may be able to see or hear one of these birds of prey. Begin your search at the Visitor Center, where National Park Service personnel can direct you to the best places for observation.*



Peregrine falcons are one of the few birds that may be found worldwide. Thus far, Antarctica and polar regions seem to be the only areas without them. In spite of this broad distribution, peregrines are not found in large numbers in any one place. Rather they are known as long distance fliers, capable of migrations from the end of South America to the northern tip of North America. Such ranges are not surprising given that their prey, small birds and waterfowl, also migrates between their northern breeding grounds in the summer and their southern feeding and winter ranges. Only in mild climates does the peregrine occasionally linger year-round.

Recognizing a peregrine falcon is easy close-up, but much more challenging at a distance. Up close, the body is about the size of a crow, 15 - 20 inches tall. Wingspan is 43 - 46 inches. Distinguishing features are:

- ~ **Black to slate-colored head and neck.** This coloring is reminiscent of a black "helmet" that may extend to cover crown, cheek, and back of neck.
- ~ **Black "mustache" or malar stripe.** A line of black extends from the eye down onto the neck. The contrast of the bright white of the bird's chin and neck with the black stripe creates the impression of a drooping handle-bar mustache. Some studies suggest that this stripe protects the bird by confusing potential predators with which dark spot is really the eye.
- ~ **Yellow on cere (membrane that covers over the nostril area).** The bill itself is slate to gray in color. It is short but sharply hooked.
- ~ **Back is blue-gray,** while chest is whitish with brown to blackish horizontal crossbars.
- ~ **Tail is striped horizontally across.** On the top, the tail is light gray with dark bars; on the underside, tail is paler with contrasting dark stripes.
- ~ **Feet are yellow.** The long, powerful toes, and sharp talons are used to capture and kill prey in flight.

# Wildlife Biography: Peregrine Falcon



If students see a peregrine at all, it may well be flying off at a distance. Flight characteristics to look for are the long, pointed wings whose shape differs from the rounded tips of eagles and hawks. Wingbeats are rapid, strong, and fast, more similar to pigeons than other large birds of prey. The tail seems long in proportion to the body. The light underside of the bird contrasts with dark back and head. Unlike the prairie falcon, the peregrine does not have dark patches in the wing axils, or wing “armpits”. One of the easier methods for spotting a peregrine is to listen for its call, which is best described as a series of harsh, rasping screams. These are often heard near the nest area, when the young are begging for food, or as the adults are giving a chase.

Peregrines are superbly adapted to life on the wing. Records show them going up 1000 to 3000 feet in the air when hunting, and then stooping (plunging downwards head-first) at speeds up to 100 - 200 miles per hour to capture prey. In experiments, peregrines have been found to spot potential prey over 1/2 mile away! Both of these features are necessary, for these birds identify, kill, and carry off their prey in the air. Birds such as doves, pigeons, starlings, blackbirds, swallows, jays, magpies, sparrows, and waterfowl are favored. Bats, insects, and some rodents may also be eaten. In turn, their only predators—aside from humans and pesticides—are great horned owls and golden eagles.

Colorado National Monument is ideal habitat for peregrine falcons, which prefer cliffs surrounded by open country for nesting. They also prefer proximity to water, such as rivers, drainages, even the ocean, because of the plentiful birdlife found there. All these conditions are met within the Colorado National Monument, and luckily for the bird-watching public, the peregrines have been nesting and visible for several years. With respect and no disturbance, Colorado National Monument peregrine falcons will be successful in replenishing their population for many generations to come.

# Wildlife Biography: Swifts and Swallows



Even though swifts and swallows are part of different bird families (swifts are in the Apodiidae Family, and swallows in the Hirundidae Family), they are often spoken of as one group. Indeed, there are many similarities:

- ~ Both birds eat flying insects such as bees, flies, beetles, moths, butterflies, gnats, and mosquitoes. They catch their food while in flight, using their wide mouths like nets to scoop bugs out of the air.
- ~ Both birds are outstanding fliers, capable of great speed for their size. In addition, they stay in the air for long periods of time, and carry on many of their daily activities while on the wing. These include: feeding (catch flying insects); drinking (sipping water from the surface of rivers and lakes while in flight); even courting and copulating.
- ~ Both birds have bodies that are aerodynamic, and ideally suited for flight. Their bodies are streamlined and cylinder-like. Their wings are proportionally long and pointed. Their legs are short with tiny feet. The swift even has a flattened skull to promote the passage of air up and over the head and body, much the way modern cars are built with front ends that arc or slant up from the bumper to minimize wind resistance.
- ~ Both birds, and their young, may enter periods of torpor, a state where body temperature, respiration, and heartbeats are all lowered, leading to a period of inactivity, in bad weather or cold temperatures.
- ~ Both birds are found world-wide, and both undertake long migrations in the fall.
- ~ Both birds occupy the same areas at Colorado National Monument. Distinguishing them makes a fun challenge for classes doing bird studies and wildlife observation.

## White-Throated Swift

Seventy-three species of swifts are found world-wide, with four known in the United States, and one at Colorado National Monument. The white-throated swift is a six to seven inch long bird, whose wingspan is approximately twelve inches. Its scientific name, *Aeronautes saxatalis*, derives from the Latin word “aero”, meaning “air”; and “nautes”, meaning “sailor”. This is an excellent description for this bird, which, in profile, looks like an archery bow, with wings arced back for optimal aerial speed and minimal resistance.

Identifying features of the white-throated swift besides this arched profile include its style of flight. The swift flaps its wings very rapidly then swoops and soars in a glide. This alternating, “twinkling” pattern of wingbeats and sailing is easy for bird-watchers to recognize even from far below. Swifts are also known as one of the fastest flying birds in North America.

A second identifying feature of swifts is their color. They are black on their crowns, backs, sides, wings, and slightly forked tails. Yet their undersides, including the chin, belly, breast, and throat, are white, giving these birds their name. The white is widest below the beak and narrows in a V-like shape to the base of the tail. On the swift’s sides, near the tail, are two distinct patches of white that are separated from the white of the belly by the black. These flash distinctively in the light as the bird moves.

# Wildlife Biography: Swifts and Swallows

BACKGROUND FOR  
TEACHERS

## Violet-Green Swallow

Of the seventy-nine species of swallow around the world, eleven are found in North America, and eight in the West. Four species are known to visit Colorado National Monument, the violet-green swallow being seen most often. It is five to five and one-half inches long, slender and a fast and agile flier. Like the swift, its main source of food is insects, such as flies, bees, mosquitoes, gnats, leafhoppers, ants, grasshoppers, and moths. However, while the swift soars high above the canyon walls and mesa tops, the swallow may be observed at a range of elevations. It may go back and forth across open areas, ponds, rivers, trees, and shrubs, almost touching the water as it flies, diving and climbing as it chases its prey. This style of flying is one way to identify the violet-green swallow, and gives it its scientific name, *Tachycineta thalassina*, which is Greek meaning "swift-moving."

Color is another way to identify the violet-green swallow. Iridescent, glossy purple-green on the back, wings, head, and tail contrasts with bright white on the chin, neck, breast, and belly. White also comes up onto the face, with the effect of an apostrophe encircling the eye. Thus, the swallow's body seems to be put together from two different parts, a dark upper and a light bottom. Like the white-throated swift, with whom it often associates, the swallow has two crescent-shaped patches of white that curve up on either side of its rump, and seem almost to meet over the tail. In the swallow, these patches are solid white from the belly up onto the back, whereas the swift has a contrasting black line of feathers between the white of the belly and the white of the patch. These color patterns are visible even as the birds are flying overhead.

Wing-shape also distinguishes the violet-green swallow. The wings extend from the slender and cylindrical body with a very recognizable elbow-like bend in them. This is quite unlike the smooth bowed shape of the wings of the swifts.

The different songs of the swallow and swift can be a final aid in separating the two species.

If a twitter, sounding like *chit-chit-chit, tweeeet, tweeeet*, is heard, the violet-green swallow is more likely. If the song descends in scale and volume, from a loud *gee* to a softer one, as if the singer ran out of breath, *GEEEE-Gee-gee-ge-ge*, then the white-throated swift is the singer. Even without clearly seeing the birds, their voices, and often the elevation at which you hear them (the swift up high in the sky, the swallow down lower), can assist the bird-watcher in recognizing these two marvelous fliers.



white-throated swift (above)/violet-green swallow (below)

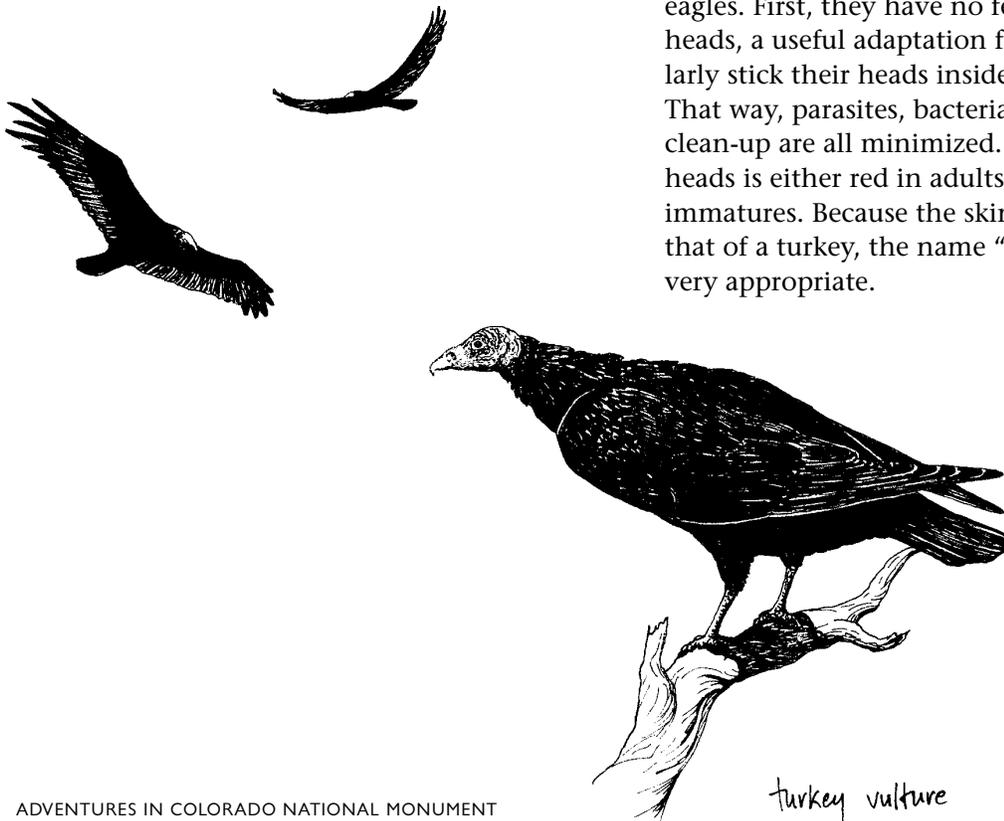
# Wildlife Biography: Turkey Vultures



*Bird-watching at Colorado National Monument is always enhanced with a view of a turkey vulture soaring across a mesa top, or swooping in and out of shadows along a canyon wall. These large, graceful birds are related to California and Andean condors, and not to eagles or hawks, with whom they are often confused. In spite of their similar size (26-32 inch body, 6 foot wingspan) to birds of prey, a closer look at vultures reveals many differences.*

Foremost, turkey vultures are scavengers, subsisting on carrion, or dead animals. They do not chase, capture, and kill their food as hawks, falcons, and eagles must. Instead, with excellent eyesight and a keen sense of smell, they scan the countryside for dead, even putrefying, carcasses. A vulture that sights a potential meal signals its discovery by descending rapidly to the ground. Soon after, other vultures sail in to join it. With beaks designed for tearing and crushing, they feast on the flesh, organs, and bones of whatever rodent, reptile, bird, cow, or domestic animal that has been found. Roadkills are a common food source. The reputation of the vulture is not always what it deserves to be. Where hawks and eagles are viewed as predators high on the food chain, turkey vultures are often seen as the garbage collectors and undertakers of the bird world. And yet, fossil remains of vultures are known to go back 65 million years, suggesting that the success of these unusual birds demonstrates the importance of their unique role in nature.

As carrion eaters, turkey vultures have several features that distinguish them from hawks and eagles. First, they have no feathers on their heads, a useful adaptation for birds that regularly stick their heads inside rotting corpses. That way, parasites, bacteria, insects as well as clean-up are all minimized. The skin on their heads is either red in adults, or sooty-black in immatures. Because the skin color resembles that of a turkey, the name “turkey vulture” is very appropriate.



turkey vulture

# Wildlife Biography: Turkey Vultures



A second feature that is unique to the Vulture Family is a more highly developed sense of smell than in many other bird species. Turkey vultures are known to be sensitive to specific scents, such as that of methane gas, which is released during the decomposition process. Along the Alaska Pipeline, oil workers pay attention to turkey vultures, because a release of methane gas around a well head or on the pipeline will draw these birds in.

A third feature of turkey vultures is the way they fly. Because fewer dead animals exist in nature than live ones, the vultures' next meal may be several days off. Thus, conservation of energy is very important for these birds. Much of their routine is timed to benefit by the growing heat of the day. Air warmed by the sun rises into the atmosphere in what scientists call "thermals." Turkey vultures catch these rising air currents, which carry them high into the sky without the vultures having to expend much energy of their own. Higher up, winds carry them along, so that they merely spread their wings, steer with their tails, rock back and forth for better views, and soar across miles of countryside with little physical effort. Thus, while some birds are active early in the day, vultures are easiest to locate as the day warms up, about mid-morning. A bird that is circling upwards in the sky, or that floats along the canyon rim; one that rarely flaps its wings; one that holds them upwards in the shape of the letter "V"; one that seems to rock back and forth to steer, is most likely a turkey vulture. Eagles and hawks will also soar, but they flap their wings more often, and do not rock back and forth.

A fourth feature of turkey vultures is their color and shape. They are sooty-black to dark brown on their tails, backs, heads, and underbodies. Their wings are two-toned: the flight feathers are gray, while the wrist and axillary feathers match the rest of the bird. No other bird in our area has this wing pattern. In profile, the head seems recessed in behind the wing. Eagle and hawk heads tend to extend beyond the wings.

The time of the year is important for spotting turkey vultures at Colorado National Monument. Because of cold winter temperatures here in the Grand Valley, these birds migrate southwards from October to April. A sign of spring is the return of these graceful, soaring scavengers.

# Developing Wildlife Viewing Skills

The following activities have been developed as warm-up exercises for viewing wildlife on field trips. They may be done in either the classroom or the schoolyard setting. The lessons center on techniques to improve observation and listening skills, key elements in successfully locating wildlife. Practicing these activities may result in students achieving surprisingly good views of wildlife on their visit to Colorado National Monument.

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## What Do I See?

When visiting a natural area or wilderness, many people overlook wildlife that may be nearby. The reason for this is the narrowness of their focus. They may be thinking about something else besides what is around them, humming, or talking with a companion. Many people simply watch the path itself as they travel as quickly as they can to a specific destination. By widening their view, many hikers are rewarded with new discoveries. They may, however, have to slow down!

In his book, *Field Guide to Nature Observation and Tracking*, naturalist and author Tom Brown, describes an exercise to reduce this “tunnel vision.” He writes:

“...Spread your arms wide to the sides and behind you. Then, wiggling you fingers bring your hands gradually forward until you detect the first flicker of movement out of the corners of your eyes. That is your field of view laterally. (With most people, it is nearly 180 degrees!)

“Next, wiggle your fingers while holding one hand high over your head and the other at your side. This is your vertical field of vision, an almost 150- to 160-degree arc from ground to sky...”

Before trying this exercise in the classroom, hide ten or more objects belonging to students along the walls, shelves, window ledges of the room. Preferably they should be along two opposing walls. When the students come in, ask them to stand at their desks, and try Tom Brown’s exercise to enhance peripheral vision. Afterwards, keep the class standing and facing one of the walls with nothing hidden. Tell students that they must remain facing this wall, and may NOT turn their heads. Hidden on the edge of their vision, on the two opposite walls, are ten items that do not belong where they are hidden. Together the group can find them. No one person should be able to find them all. Working together, they can discover all the items. The teacher confirms and writes down on the chalkboard what is found by using peripheral vision.

After this exercise, students will be more aware of the potential range of their view, and tend to use it more readily. Suddenly, things that were not noticed before, small movements of grass, the fluttering of leaves, even the twitch of a cottontail’s ear as it hides under a nearby bush, are now detected. The potential of the class for discovering wildlife along the trail is greatly improved by using Tom Brown’s exercise to reduce “tunnel vision”.

# Developing Wildlife Viewing Skills

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## Camouflage Dressing Hide and Seek

This experiment teaches the value of blending in with the environment when people want to see wildlife. To get close to animals without being seen, duck hunters and wildlife photographers hide in blinds, or shelters made of materials that blend in with their surroundings. Bow hunters dress in camouflage clothing so that they go undetected by their quarry. Students seeking views of wildlife can benefit by similar environmental dressing. To appreciate the effectiveness of camouflage, try this version of the long-time favorite, “hide and seek”.

To begin, find a wooded area, a field of tall grass, or an open space with bushes that is near to the school. Take students there, and discuss where the boundaries are. Next, explain that you are going to play a game of hide and seek to see who is the hardest to find. While you close your eyes and count out loud to 30, the students are to find hiding places. When you open your eyes, whomever you spot and name must come and stand with you. The only rule is that the group must stay within the given (and very clear) boundaries. A helpful consequence to assure boundaries are respected is that if the boundaries are violated, the group automatically and immediately returns to the classroom.

When everyone is ready, turn your back and count slowly and loudly to thirty (or more, at your discretion). Students should run and hide. As the giggles die down, warn the hiders that you are going to turn around. Slowly turn and survey the area. See how many students you can find. Frequently, those in brightly colored clothes, or colors contrasting with the area around them, are the ones easiest to spot. Call those students in. Let them join you in the hunt for the rest of the group. The last person to be found is “it” for the next round. After playing this game several times, students will be noticeably more difficult to locate.

At the end of the game, analyze what happened. (You can designate a recorder who lists the first and last five students to be found. An interesting math and graphing problem could be to compare clothing color with ease of discovery.) Why was the person wearing neon pink so easy to locate? Why couldn't anyone find the person dressed in beige or brown? Whom do you think the animals at Colorado National Monument would have spotted the fastest? Why would that person be so easy to find? What could he/she do to prevent this in the future? Conclude with the suggestion that for the field trip students try to dress to blend in with their environment, and therefore help everyone to be able to find more wildlife.

# Developing Wildlife Viewing Skills



## **Nature's Hiding Places**

On the chalkboard, make a list of places where the students think that mammals, birds, reptiles, amphibians, and insects would find shelter. Options to include are: piles of dead brush; high in a tree; close to the trunk of a tree; in the crevice of a rock; underneath a rock; in a bunch of tall grass, etc. Match wildlife with each setting. Remind students that these are the kinds of places to look for wildlife on their field trip to the Colorado National Monument. After discussing the need for shelter, list the other needs that wildlife has, such as food, water, community, and space. List other places in which students would expect to find wildlife, including water holes, pinyon trees, berry patches, rock ledges with good views, etc.

# Developing Wildlife Viewing Skills



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## Quiet Voices

(NOTE: You should enlist the support of your fellow teachers before you conduct this experiment on their classes. You may also want to pick a teacher who does not mind a little disruption.)

Before these experiments, choose one or two people to be the “counters”. They will not participate in the activity. Instead their job is to count the number of people who respond in the other classrooms.

### Part 1

Begin by taking your students outside to a place near the window of another classroom. Tell them to look in the window, and begin jumping up and down, waving their arms, and making a lot of noise. The “counter” watches the students in the classroom, and tallies exactly how many people look away from the teacher to pay attention to these silly antics at the window. Discuss the students’ observations of the consequences of their noise-making. What would happen if the group came by a second time? Would more of the class respond, or less?

### Part 2

As the group approaches a second classroom, tell students to walk slowly and quietly past this window. Again the counter focuses on the number of heads that turn to observe what is happening outside. What was the response of the second class. How was it different from the first group? Compare and contrast the two methods of travel for the group. How are wildlife affected by noisy versus quiet groups? What can be learned for ways to travel on the field trip? Which kind of voice is going to help the group to see more wildlife?

# Developing Wildlife Viewing Skills



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## The Ears Have It

This exercise can be done in the classroom or outside. Ask students to form a circle with their backs to one another, and their eyes focused outward, and straight ahead. In this arrangement, get students quiet. Then ask them to count how many sounds they hear in ten seconds. Afterwards, have students report how many sounds each one heard, and what they were. (*A word of advice:* Competition may set in, making it impossible to truly assess what was heard or how many things. If the leader begins by saying that he or she heard three things, this will give the students a reality check on how much they really heard.)

With students still in the circle, ask them to close their eyes and listen a second time for ten seconds. How many sounds did the group hear this time? Did they hear more with their eyes open, or with their eyes closed? Each time that this exercise is repeated, the students should note more sounds, and become more aware of their own level of noise-making.

Ask the class to consider what happens at Colorado National Monument when rabbits, squirrels, and birds hear new and loud noises in their environment? What can students do about their own noise levels as they head out on the trail? What can the group do to be able to discover more wildlife?

# Developing Wildlife Viewing Skills

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## Quiet Walking

Prepare for this activity by paying attention to the types of clothing and shoes that your students are wearing. Choose a person wearing noisy shoes or clothes, or with a heavy gait, to go out of the room on a short errand for you, such as filling up a cup of water at the drinking fountain. (Clogs, work boots, heavy soled shoes, squeaky sneakers, loose pants that rub against one another, wind breakers, or stiff clothing that rustles are good choices for this activity.) When the helper has gone, tell the class to be very quiet and listen for his or her return. Ask them to raise their hands when they hear him or her coming down the hall. When the person arrives, explain the trick you pulled, and have students tell the person what they heard. Repeat this activity several times, and notice how sly the students become on their return from the “errand.” The purpose of this activity is to heighten students’ awareness of the level of noise that they make without being conscious of it.

For an additional experiment, ask the class to lie on their stomachs with their ears to the ground when the “helper” goes out on the “errand.” Can they sense someone’s approach from the vibrations in the floor around them? Snakes, which are deaf, rely on their bodies to sense tiny movements in the earth to that tell them when someone, or something, is approaching. As a result, they are more alert and sensitive to sounds within and around them. Discuss what the students noticed when they were lying on the ground. What have they learned about noise and vibrations that can be applied to their field trip?

# Developing Wildlife Viewing Skills



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## I Spy

This is another useful activity to develop observation skills in advance of a field trip. Most students and teachers think they are familiar with their school “habitat” based on how much time they spend there. Yet they are quite surprised to see who else is living right along side them, yet overlooked. Send the class out to discover as many examples of “wildlife” as they can around the school building in fifteen minutes. This can include animals, birds, reptiles, amphibians, insects, spiders, crustaceans, and mollusks. Students must document their findings by recording the exact location of wildlife on a sheet of paper. Teams can be sent out to different areas, or everyone can concentrate in one room. Examples of findings are: ravens on the playing field; black widow spider in a web behind the teacher’s bookcase; dead cricket under a computer terminal; domestic cat walking by the 6th grade window; centipede in the carpet by the principal’s office. All ages enjoy the discovery process. Documentation and observation of behaviors can be made more complex for older age groups.

# Animal Signs

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## Age Level

4th through 8th grades.



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## Purpose of the Activity

The purpose of this activity and its worksheets is three-fold.

- 1) To aid the student in identifying signs of wildlife, such as tracks and scat.
- 2) To introduce students to a structure for formally recording and comparing observations, like a wildlife biologist might use to make wildlife observations in the field.
- 3) To give teachers specific material for a small field notebook to aid in focusing, guiding, and documenting student discoveries on a field trip at Colorado National Monument.

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## Amount of Time Required

This activity is very flexible. Depending on the teacher's needs, it can last from thirty minutes to several hours.

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## Materials Needed

### Each student needs:

- 1 copy of track worksheet.
- 1 copy of scat worksheet.
- 1 - 5 copies of wildlife observation sheet. (Number will vary with age and amount of time that will be spent on this activity.)

### The teacher will need:

- Stapler to put worksheets together into a book form.
- Field guides to wildlife identification and tracking to supplement information provided.

### Optional:

- Colored paper covers to make the worksheets into a more personalized notebook.
- Worksheets on plant identification from "Botanical Journal" or "Plant Scavenger Hunt" to add to the notebook for more complex and complete habitat investigations.
- Binoculars, cameras, and magnifiers.

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## Best Location

Due to the flexibility of these worksheets, many different locations may be used. For one-half day for a field trip, use these “field guides” on trails near the Visitor Center, such as the Alcove Nature Trail, Canyon Rim, or Otto’s Trail. Devils Kitchen and Old Gordon Trails are also good options on the East Side of the monument. For day-long outings, Black Ridge, Liberty Cap, and Monument Canyon Trails all have plentiful signs of wildlife.

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## Background Information

Visitors to national parks often assume that by coming to such a natural setting they will see wildlife. Many are disappointed that “nothing” was there. In fact, many kinds of wild animals, birds, reptiles, amphibians, insects and spiders make the canyons and mesas their homes, but they may not be visible right away. The visitor willing to take time, be aware of the surroundings, and move with a quiet step and voice, can be rewarded with close-up or extended views of a diversity of local inhabitants. In order to be successful in wildlife watching, students must learn to distinguish their behavior on the school grounds from that on a field trip. For activities to practice such behaviors prior to an outing, the teacher may want to try some of the exercises listed in “Developing Wildlife Viewing Skills.”

Even though wildlife may not be on the trail, you may still encounter signs of many dramas that have unfolded. By traveling slowly, and taking time to investigate the details of the rocks, canyon walls, pinyon trees, and even in the depths of a bunch of grass, signs and stories of what has come before are awaiting discovery.

Perhaps a mule deer rubbed its growing antlers against the bark of a tree. With a closer inspection, you may spot a tiny scrap of the fur that came free...

Moments before you arrived, a desert cottontail rabbit hopped across the dusty path leaving a trail of perfectly etched front and back footprints. Where was it going? If you pause, look for movements trailside, and listen for rustlings in the bushes, you may be rewarded with a view of the rabbit nibbling on a rice grass stem...

Dangling from a tree branch is a bright blue feather that catches your eye. Below it is a pile of empty pinyon cones. Together they mark the molt and the meal of a pinyon jay...

What looks like white paint splashed on the canyon wall is actually the feces of a raven that perches at that place every day to warm itself in the early morning light...

# Animal Signs



A second glance at a small heap on a rock reveals a pile of kit fox dung. In it is the story of a race for a burrow, and the fur and bony remains of a kangaroo rat that was not quite fast enough to escape the fox...

Amongst the dirt and pebble debris atop a harvester ant nest rests a bright colored rock. A closer look shows the rock to be a chip from an arrow point of a long ago people.

Thus, as wildlife goes about its daily (or nightly) activity, it leaves behind many such signs and stories for the attentive watcher.

While close-up views of wildlife like those seen on television may elude many park visitors, given a relaxed pace, and attention to detail, many stories about area inhabitants may be revealed. Feathers, nests, bedding areas, diggings, chewings, burrows, and webs are clues as to what is nearby. The following pages include pictures and descriptions of animal tracks and scat (droppings) that might be seen in the monument. The sheets may be copied for use singly, or they may be organized into a small field notebook for students to take with them on the field trip. Each page offers identifications of specific tracks and scat, as well as space for students to record their own discoveries.

## How to Do the Activity

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### Before the trip

Copy off the “Track and Scat Identification Sheets” as well as the “Wildlife Observation Sheet”. Depending on the length of the field trip, the age of the students, and how many other activities that you want to use, compile the sheets into a small “Field Guide to Colorado National Monument’s Wildlife”. The teacher may want to involve students in the compilation, decoration, and individualizing of the notebooks. If nature magazines are available to cut up, pictures of animals may be glued on to make the “Field Guides” very unique.

### Classroom Discussion

In class, discuss the types of wildlife that students expect to find at Colorado National Monument. It is worth emphasizing the rodent, rabbit, lizard, bird, insect, and spider populations, as their sheer numbers make them more likely to be seen. For still more linkage to curriculum standards, you may want to expand the review to include food chains, and the diversity of them to be found in the area.

### Develop Stories About Wildlife

Next, ask the class what all creatures need in order to survive. Food, water, shelter, space, community, procreation, and safety should all be covered. Then, investigate one animal in particular. How does it go about its daily life in order to meet those basic needs? As a group, develop a story about that creature and how it survives. For example: “As the sun rose, the desert cottontail could feel the warmth inside its burrow grow. It peeked out the hole, and looked around to be sure it was safe. Moments later, it hopped over to a bunch of grass and began eating. Scampering to the next patch of grass, it left footprints in the soft earth, and a trail of tiny, round, brown droppings. When the shadow of a golden eagle passed over the area, the small rabbit froze in fear. The eagle sailed on, and did not see it camouflaged against the bush. The little cottontail was safe—for now.” If possible, write the story down on the chalkboard or a piece of paper for future reference.

Ask the students what signs of life the cottontail might leave behind. Make a list of them on the chalkboard. Refer to the story, and see how it gives information about the signs the cottontail left behind: a burrow (shelter), tracks, droppings, and chewed off grass blades. Even if you never see the cottontail, the signs of its activities tell the story of its life.

Lastly, divide the class into teams, and repeat this activity, with each team developing a short story about some wild creature and the signs it leaves behind. If time runs short, this can become a homework assignment.

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## Step-by-Step Instructions for the Field Trip

At the start of the hike, pass out the “Field Guides” made previously in class. Review with students some of the “Tips for Spotting Wildlife”, and establish rules for the class to follow for both safety of the wildlife and for themselves. Reminders that students should NOT pick up lizards (many bite), dig up burrows (things in them bite), or reach up onto ledges with their hands where they cannot see (snakes bite too), are important.

If students fill out the “Wildlife Observation Sheets” as they go, the group is likely to become too spread out along the trail. A better option is to choose several places that the teacher has scouted previously in which to concentrate the search. Working singly or in teams, students look for signs of wildlife throughout a large area. If they find droppings of a deer or rabbit, encourage them to look nearby for signs of the animals’ chewing on leaves or grass. If fox or coyote scat is discovered, have them look closely to see if they can determine what the animal ate (berries, beetles, mice, etc.)

When a track or scat is found that cannot be identified with the sheets, ask students to draw AND write a description of it. This is the note-taking method used by wildlife biologists when they are in the field.

A similar approach can be used about wildlife observations. Once a creature is spotted, ask students to watch its actions and try to remember as many details about it as possible. Later, the “Wildlife Observation Sheet” can be filled out with information gathered.

With more than one of these sheets included in the notebook, several observations can be made. If an uncommon animal, one exhibiting curious behavior, or one traveling in an unusual place is seen, the wildlife observations of the students can be very useful and important to National Park Service staff. Your class may want to call the rangers with the report, or forward copies of the observation sheets to them.

# Animal Signs



## Extensions

This activity may be expanded in the classroom in the following ways.

- ~ Technical writing. Students research a specific bird, animal, reptile, amphibian, spider, or insect living at Colorado National Monument. These may be ones seen on the field trip — or not, at the teacher’s discretion. Research is undertaken using a variety of sources, from field guides, to natural history narratives, to newspaper articles, to scientific journals available at Mesa State College or the public library, to the Internet. In some cases, interviews of wildlife officials may be most informative. When research is complete, a short paper is written using the structures and styles of a scientific journal.
- ~ Classroom discussion. Students discuss how the skills of wildlife observation and identification of tracks and scat would be used by earlier cultures. For example, how would “reading the land” help a settler in the Grand Junction or Fruita areas to choose a home site? How would such skills assist a Ute hunter to provide for his family? How do such skills benefit modern people? Can such skills be used to determine about population changes, impacts of pollution, weather, or even fire?
- ~ Create a food web. Students work as teams to incorporate the information that they learned in the field with projections they make in the classroom. They design a food chain using the signs, tracks, and other observations that they made at the Colorado National Monument. For example, if a student observed a yellow-headed collared lizard on a rock, what kind of food would it need to survive? What do those creatures need to survive in turn? And those creatures? The cycle spirals down until the most basic elements needed by plants are reached, including sun, water, and soil. The food chain may also be extended upwards. What would eat the lizard? What would eat that predator, and so on, until either human beings or nothing else eats that creature is reached. This web can be represented graphically or in words on a piece of paper.

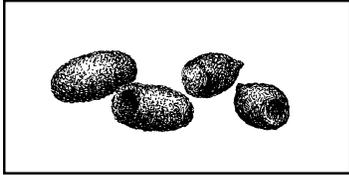
~ Even though you do not see wildlife on the trail, you may still encounter signs of many dramas that have unfolded. If you slow down, and take the time to investigate the details of the rocks, canyon walls, pinyon trees, and even in the depths of a bunch of grass, you will discover signs and stories of what has come before. Perhaps a mule deer rubbed its growing antlers against the bark of a tree. With a closer inspection, you find a tiny scrap of the fur that came free. A cottontail rabbit hopped across the dusty path, creating a trail of perfectly etched front and back feet. Where was it going? Dangling from a tree branch is a bright blue feather. Below it is a pile of empty pinyon cones. Together they mark the molt and the meal of a pinyon jay. What looks like white paint splashed on the canyon wall is actually the feces of a raven that perches at that spot every day to warm itself in the early morning light. A second glance at a small heap of sticks atop a rock reveals a pile of kit fox dung. In it is the story of a race for a burrow, and the fur and bony remains of a kangaroo rat that was not quite fast enough to escape the fox. Amongst the dirt and pebble debris atop a harvester ant colony rests a bright colored rock. A closer look shows the rock to be a chip from an arrow point of a long ago people.

The following pages are pictures and descriptions of animal signs you might see in the Colorado National Monument. They may be copied or organized with the “Wildlife Observation Sheet” into a small field guide for students to take with them on the field trip. The sheets will provide students with identifications of tracks and scat, and space to record any discoveries of their own.

# Animal Signs



## Scats



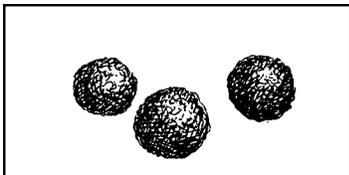
**Mule Deer**

Looks like small brown rocks or pebbles. May be clustered or scattered over a distance. Shape is blunt oval, about the size of a thumbnail, in some seasons. Other times scat resembles a stack of small pancakes one atop the other.



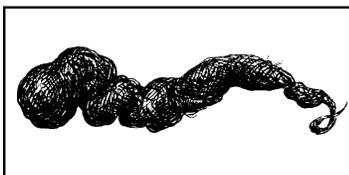
**Desert Bighorn Sheep**

Resembles deer droppings, only larger. In shape, they may look like acorns, round at one end, and pointed at the other. May be clustered or scattered over a distance. Found on ledges and talus slopes, occasionally near pools of water.



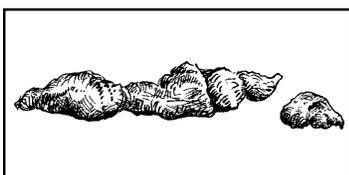
**Desert Cottontail**

About the size of a hole punched in a sheet of notebook paper, these small, ball-shaped droppings are brown-green when fresh. When dry, they are white, and look like pebbles. Very common by clumps of grass and under trees.



**Coyote**

Although it looks like dog feces in size and length, inspection will show coyote scat contains animal hairs, bones, seeds, insect parts, even trash. In contrast, dog scat has no hair, is uniform in texture, and is the same color as dry dog food.



**Gray Fox and Kit Fox**

Scat is smaller than coyote's, about the size of a human finger. Rodent or rabbit hair, bones, seeds, insect carcasses are commonly found in it. Segments are drawn out to long points with twisted hairs connecting them. Seen on trail or rocks.



**Bird Droppings**

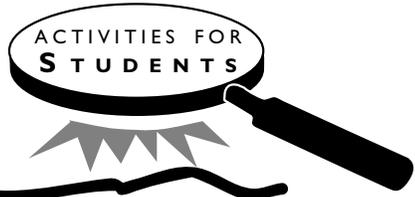
Bird droppings are a liquid mixture of white urine and dark feces. In places where birds perch, feed, or nest on rocks or cliffs, large patches of droppings develop. This "whitewash" can be an indicator of where to find eagles, ravens, or hawks.

**Draw a scat you found.**

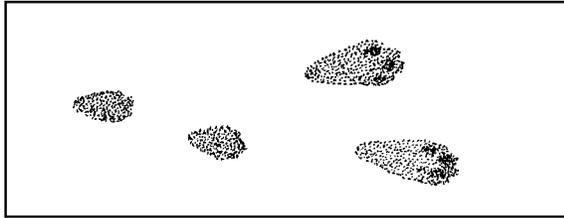
**Can you identify who made it?**

**How would you describe it?**

# Animal Signs

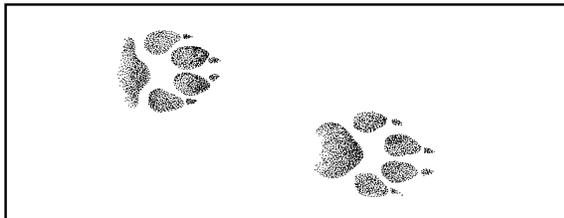


## Tracks



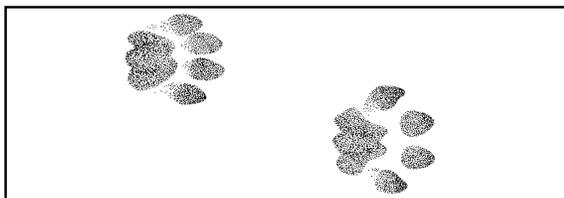
**Desert Cottontail**

Four footprints visible at once. Front feet make small circles. Hind tracks show feet and part of lower leg, making long, oval tracks. Larger hind feet usually land in front of smaller front feet. Occasionally claws visible. No pads seen. Found in scrub areas. Tracks do not go far from burrow.



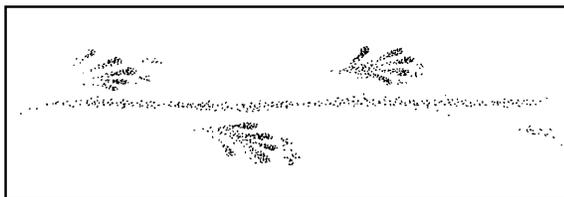
**Coyote**

Prints look like a dog's, with 2-4 claws visible. Four toe pads form a close semi-circle around a larger triangular main pad. Front foot is larger than hind foot. Tracks may be in a straight line; front and back feet alternate when walking. Front and back feet come down together when trotting.



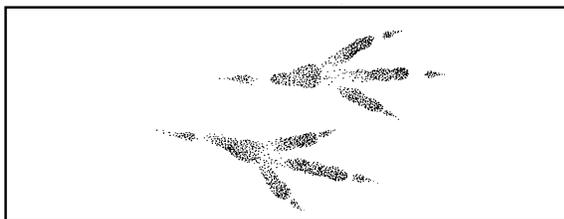
**Mountain Lion**

While pads may look similar to coyote, claws do not show up. Front foot larger than hind. Toes widespread, especially if running. Track is usually wider than long, as compared to a coyote track, which is longer than wide.



**Lizard**

Lizards make tracks that are quite distinct. They are often found in the dust along trails or near rocks where lizards make their homes. Between four small, long-toed footprints that point outward is a long thin line created by the tail dragging along behind.



**Common Raven**

Track is three-toed, talons often visible. Size varies from 1 to 1 1/2 inches in length. Toes spread out but are all forward pointing, like holding up three middle fingers as you count. Impressions of the foot joints and the ankle bone may also be found. Tracks wander around, then vanish.

**Draw a track that you see.**

**Can you identify it?**

**Describe what it looks like.**

# Lizard Patrol

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## Age Level

4th through 8th grades — and up.



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## Purpose of the Activity

The purpose of this activity is to create a structure for observing and reflecting about wildlife. For many students, their contact with animals is a cat, dog, or goldfish at home. Without experience in a natural setting, they do not know how to go about looking for, or looking at, wildlife. While this activity cannot guarantee that the class will find any wildlife, it will certainly spark an awareness of what could be out there. Secondly, skills related to reading, writing, note-taking, analyzing, and synthesizing are all utilized.

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## Amount of Time Needed

30 minutes in the classroom for Part One. 30 to 60 minutes in the field for Part Two. 30 to 60 minutes for Part Three.

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## Best Location

Part One and Part Three should take place in the classroom. For Part Two, the wildlife watching, any trail in Colorado National Monument may be used. The group will have more success on trails that are not heavily traveled by other park visitors. If lizards are sought specifically, then Monument Canyon Trail (lower or upper); Devils Kitchen Trail; Otto's Trail; Alcove Nature Trail; and Canyon Rim Trail will give the most sightings. Older groups may want to use the east side of Devils Kitchen area, where three developed trails come together: Devils Kitchen, Old Gordon, and No Thoroughfare Canyon.

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## Materials Needed

### For Part One:

- Books and poetry by nature writers.

### For Part Two – The Field Trip:

- Blank paper, clip boards, and pencils are all that is needed for this activity. Binoculars are a real asset for spotting animals at a distance, but are optional.

### For Part Three:

- Blank paper, colored pencils, markers, pencils.

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## Background Information

Not so long ago, watching wildlife was a matter of necessity. Animals represented food on the table, warm clothes in the winter, and danger in the form of predators. The lives of humans were intertwined with those of the birds and animals nearby. Today, wildlife watching is a matter of recreation. Separated from the need to hunt, our connection to the land has changed. We visit parks and open space for enjoyment and relaxation; then we leave them behind.

As we have grown separate from the land, our knowledge, comfort, and vision of it have diminished. Wild places now represent the unknown, and feel foreign to many people. Such distance makes it difficult to care about what happens to the land, and its inhabitants. Rather than seeing our common ground with wildlife, we end up feeling scared or threatened by how unfamiliar it is. We squash spiders, fear snake bites, and worry about attacks by “wild” animals. Thus, our modern lifestyle has come to hinder our ability to “see” and experience the natural world around us.

The terms “seeing” and “observing” often have a passive connotation, that an individual is sitting back and not “doing” anything. The dictionary defines “seeing” in a different light. To “see” is to: “a) perceive with the eye; b) to have an experience of; c) to come to know—discover.” “Observing” involves “sensing with careful, analytic attention.” Under these definitions, “seeing” and “observing” become vital, active skills of value in a variety of situations including the classroom and the field trip. These interpretations of “seeing” and “observing” are at the core of this activity. Yet, instead of the classroom being the center of learning, the tables are turned, and nature becomes the instructor with whom discoveries are made.

The ability to “see” does not always happen quickly. More, it is a skill that is developed over time. Beginner’s luck at discovering things certainly exists. However, the ability to read the landscape, to tell what happens there and who lives there, requires an attitude of openness, and awareness that may take a lifetime to achieve. “Lizard Patrol” is a beginning step on that path.

This three-part activity is intended to help make a connection between children and wildlife. In the first segment, students read about nature, wilderness, the opening of a flower, the beauty of a bird’s flight, through the words of a variety of nature writers. With the perspectives of wordsmiths as inspiration, the students undertake the second segment of the activity: exploring a part of Colorado National Monument looking for lizards and wildlife. Moving slowly in small groups, they look for evidence of animals’ passage. Settled in one place for fifteen minutes, they observe and record what happens around them. In this safe structure and quiet time, students have an opportunity to learn from nature and its many inhabitants. On returning to the classroom for Part Three, students write poems, short stories, or essays of their own, inspired by their experiences.

This activity is titled, “Lizard Patrol” because Colorado National Monument is fortunate to have terrain that is much appreciated by lizards. Certainly a diversity of other bird, mammal, and insect life also thrives in the canyons and mesa tops, but lizards stand out for their abundance. Because of the quantity and diversity of lizards, and because their times of activity coordinate well with the hours of a field trip, lizards are among the easiest wildlife to be found in the park. Even though they are the focus of this activity, sightings cannot be guaranteed. Clouds, cool temperatures, rain, or the opposite, too much heat, can reduce their visibility. For more information about lizards specifically, see p. 131 in the background information for teachers.

Before going out on the field trip, introduce the class to the nature writings and poetry of a wide range of authors. Suggested writings include those of Henry Beston, Sigurd Olson, John Muir, Wendell Berry, Rachel Carson, Robert Bly, Annie Dillard, Aldo Leopold, Henry David Thoreau, Basho, Terry Tempest Williams, Gary Nabham, Barry Lopez, David Quammen and a multitude of others. No doubt the instructor will have some favorite authors and passages to share as well.

Each of the writers listed above spent time in nature as an observer. In their explorations, they discovered a joy and a humility at their place in the universe. Their reverence for the complexity, magic, and beauty of life is expressed in their language. Take advantage of the inspiration that these writers offer to the class. As students read about the intimacy and caring that these people felt about their subjects, and the land, the stage is set for the field trip, and making records of the experiences of the class in nature.

**A curriculum note:** Using such works, together with your class doing their own nature observing and writing, meets a number of different educational content standards for students in the areas of reading, writing, and science.

Before the field trip, gather a variety of writings about nature from different authors. Try to find enough so that each student may have their own book. The local library, fellow teachers, and parents are excellent resources for supplying you with material. There is a remarkable wealth of diverse nature writing available. An essay from *A Sand County Almanac*, by Aldo Leopold, is highly recommended for students in 6th grade and higher.

Invite some parents or friends to join you on this field trip as adult leaders. Their involvement will enable the group to be divided into smaller units for better success in finding wildlife. Groups of four or five students with an adult will also have an easier time writing and reflecting. The quiet, alone time can be more easily managed, and comfort maintained. However, if other adult leaders are not available, this activity can still be done as a large group.

# Lizard Patrol



It is very useful for the teacher to preview the trail(s) that the class will use in order to find spots where wildlife has been active. Look for signs, tracks, and trails creatures may have left. Scat, fur, burrows, chewed leaves, scrapes, diggings, flattened grass are all indications of animal use of an area. Seek out mixed habitats, such as places where drainages and sagebrush flats meet, cliffs and talus slopes abut, rock formations change, or slickrock and pinyon-juniper groves come together. These interfaces of environments, called **ecotones**, are rich environments for wildlife of all kinds to find food and shelter. They are also places where students may have more success at finding wildlife, or signs of wildlife.

You may also want to contact Colorado National Monument staff at the Visitor Center front desk to find out about any unique or interesting wildlife sightings that have been recently reported. Peregrine falcons, for example, have been known to nest within the monument during the spring and summer. They, or desert bighorn sheep, could make for some very exciting wildlife watching for the class.

Another option that you may want to consider using is the Devils Kitchen Area. Not only are yellow-headed collared lizards and many other lizard species found there, but three developed trails come together in an ideal configuration for this activity. Small groups can each take their own trail, be it Devils Kitchen, Old Gordon, No Thoroughfare Canyon. If it is not busy, even Serpents Trail can be used. This arrangement allows students to be relatively close to one another, yet still far enough apart that no one has to be in sight of another. This area is also easy for reconvening to share observations. Parking is available at either the Devils Kitchen/Serpents Trail Trailhead (cars) or at the Devils Kitchen Picnic Area (cars and buses).

## How to Do the Activity

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### Part One: Before the Field Trip

This part of the activity may take place one day to a week before the field trip. The closer the two parts are to one another, the more influence and connection there will be between them.

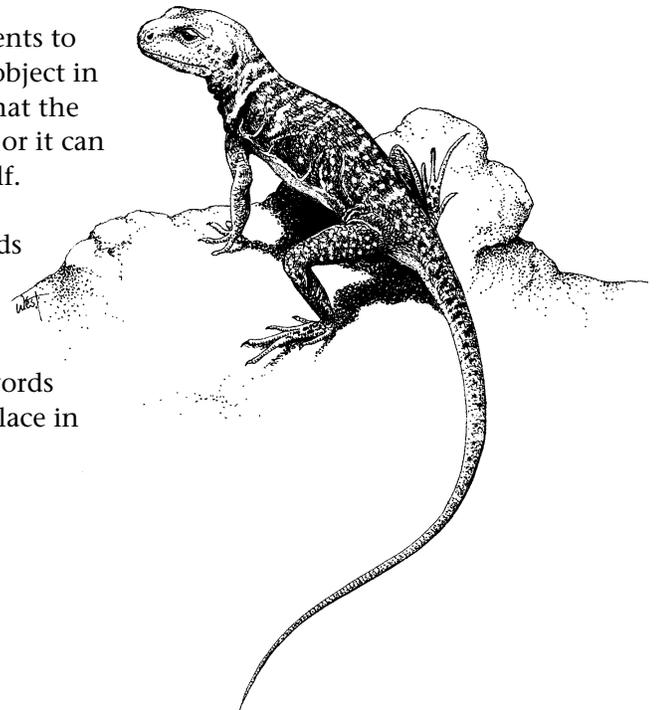
#### Choose A Nature Writing To Read

Invite students to look through a collection of nature writing that you have gathered. Each person should look through a book of their own choosing to locate a poem, passage, or image that they especially like. The teacher may want to begin by reading aloud several pieces that she or he enjoys by different authors. A humorous poem or anecdote works well as a starting off point.

Give students fifteen minutes to settle upon the writing that most appeals to them. Ask if anyone would like to share their finding. Encourage students to notice the different subjects, words, structures, and styles that the writers chose. If no one wants to share their piece, the teacher may ask each person to copy down their passage for future reference, or to mark it and turn it in so that it can be read aloud by the teacher. An important feature to highlight from each passage is how the author took time to observe and reflect upon their subject. Just as a painter must be well acquainted with the object being painted, so must the writer. Careful looking brings one closer to one's subject.

#### Observe An Object - Record Your Impressions

After the readings are complete, ask students to take a few moments to see and observe an object in the classroom. This can be a single object that the teacher brings in especially for this project, or it can be something familiar within the room itself. Students then suggest words or phrases to describe what they "see". The teacher records the words on the chalkboard, and students write them down in a notebook. Each student then composes one or more sentences about the object, and incorporates words listed on the board. The writing may take place in the classroom, or be done as homework.



For example, students look at a skull on the teacher's desk. They describe it using the words: "old", "dead", "sharp teeth", "full of holes", "looks like a tiny dinosaur." These words are recorded on the chalkboard and in their notebooks. Students then formulate a sentence(s) about the skull that describes their observations of it, and incorporates any of the words that the class used.

Thus, Part One of "Lizard Patrol" helps students both to learn how other writers view the world around them, and to practice their observation and writing skills. Part Two expands the observation effort as the class looks for wildlife at Colorado National Monument.

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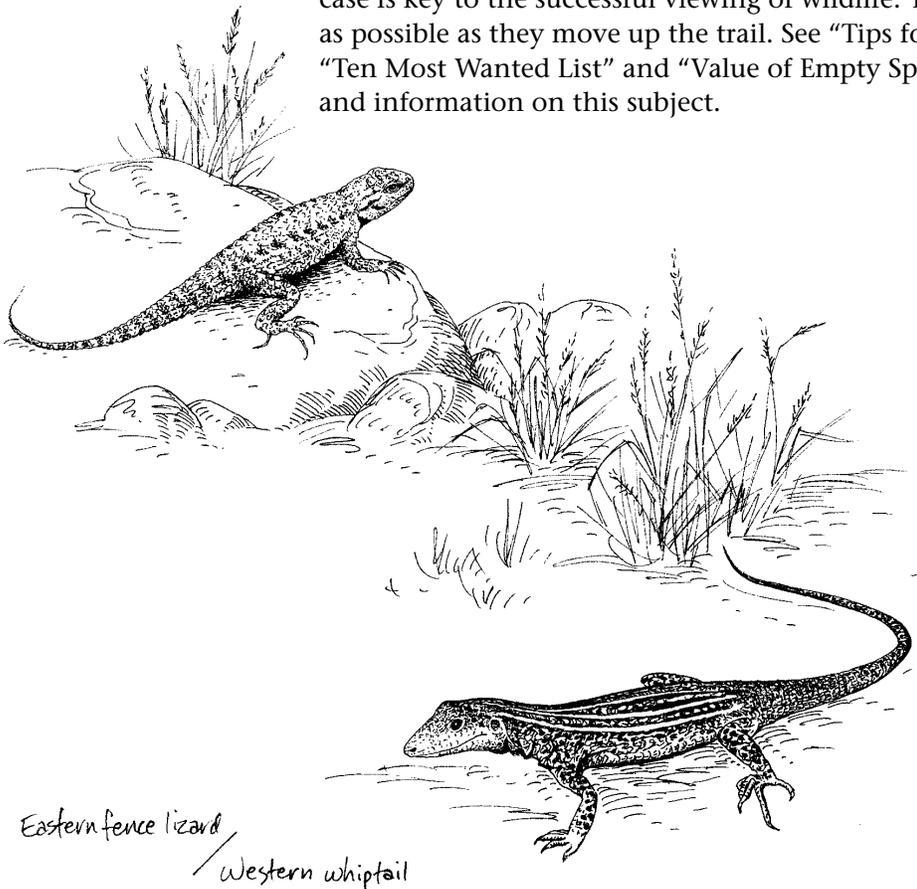
## Part Two: At Colorado National Monument

### Dividing Up The Group

Before heading out along a trail, divide the class up into small groups of 8 or fewer students. Each group should have an assigned chaperone. One adult per four to five children is ideal.

Because a large group makes enough noise to scare away wildlife, smaller groups are more viable. In addition, the more that groups spread out on the trail, the more frightening to wildlife they are.

While it is not natural for groups to stick together on a field trip, doing so in this case is key to the successful viewing of wildlife. The groups should also keep as quiet as possible as they move up the trail. See "Tips for Wildlife Viewing", "Stalking", "Ten Most Wanted List" and "Value of Empty Space" in this chapter for more ideas and information on this subject.



## The Importance of Quiet on the Trail

The leader must be very clear about the need for quiet. If people are noisy along the trail, little wildlife will be seen. Hand signals are a useful means of communication. Agree upon some signals that everyone will use and recognize when they see an animal, lizard, or bird. If a group is normally noisy, try betting them they cannot be silent for a certain amount of time. Students enjoy proving the teacher wrong, and everyone will benefit by the quiet.

If the group is divided up, each small group should head down a different path in silence for a long enough distance that they are out of hearing range of the others. If the group stays as a whole, walk a distance down the trail before pausing to look and listen for what is ahead. All groups should go slowly enough that they can spot signs of wildlife, such as scat, diggings, nests, burrows, feathers, tracks, webs, etc. Assigning individual students to count and remember the different signs of wildlife that the group finds will heighten students' awareness of the patterns of activity and life around them.

## Practicing Observation Skills

Practice observation skills on a bird. Gather the group in close when a bird appears on a nearby tree. Quietly watch what it is doing. Instruct the students to make mental notes about its color, shape, unique features, actions, location, etc. After the bird has flown on, ask the group what they saw. Try to elicit an observation from each person. Discuss when differences occur. What does the group think are the most important things to look for?

Summarize what was seen and explain that shortly the group will be making more observations about wildlife that they see. Many times, animal activities and behavior are of great interest to wildlife biologists. From their observations, they gain insight into the condition of the creature, as well as the health of the surrounding land.

After walking further along the trail, pick a place where students can spread out safely either on the path, or in an area nearby. Survey the chosen area for any potential hazards, such as cactus, glass, cliffs, or loose rocks. Avoid areas with black, lumpy cryptobiotic soil crust. It is easily destroyed if people walk or sit on it.

Once a site has been chosen, explain to the group that they will be staying in that spot for fifteen minutes, and are to find as many types of wildlife as they can during that time. Once they get settled, they must stay put, and cannot move around. No one is to speak. They are to use their eyes and ears to look and listen around them. If an insect, spider, lizard, snake, bird, or animal comes by them, watch what it does. How does it look? Try to notice tiny details like the toes, or antennae, or wing patterns. Encourage them to think of themselves as sponges, soaking up and storing as much information about the creature as they possibly can. And if nothing comes by, then watch the patterns of light and shadow; feel the wind, heat, or cold; study a rock, its shape and colors; look at the bark of a tree; observe the clouds moving by; investigate and really “see” some object or place nearby.

## **Observing All Around You**

The object of this exercise is to see and observe what is around you, no matter how big or small. Even the tiniest pebble or ant has a story to tell, or is part of a larger drama that is still unfolding. Only if we take the time to look, and have an attitude of openness to observing what is there, do we get to know about the world around us.

## **Recording What You Saw**

After fifteen minutes, ask the students to get out their pencils and paper and make a record of what they saw. They can draw or write, or both. They do not have to make complete sentences, simply write down words or phrases that describe what they observed. Give the group ten (or more) minutes to complete their recording. Be available to help anyone with problems or questions. Spelling and being correct are not as important as making an extensive a record as they can in their “field notes”. More time can be spent doing this in the classroom if need be.

When the students finish the documentation of their observations, Part Two of the exercise is complete. Depending on the length of the field trip, and on how well the group handled this exercise, it can be repeated again (often more successfully) later in the day. Often the time after lunch or a snack, or after a break following a long hike, works well for a second try at this intense viewing.

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## Part Three: In the Classroom

This final segment takes place in the classroom. Students use their “field notes” to create a short description (younger ages), or poem, haiku, short story, or narrative (older ages). Younger students should do the writing during class time, when the teacher is available to assist with questions or difficulties that come up. With older students, the teacher may choose to have students do the rough draft in the class, and the final at home, or vice versa.

First, students review their “field notes”, and complete any that need to be finalized. Corrections of spelling or handwriting are not needed. The notes in their original form are valuable of themselves.

### Organizing the Field Notes

Next, students organize the notes in an order that could be the “skeleton” into which the writing connects. For example, a student watched a bird, and made these notes:

“Bird perch on tree...move its head all around...fly up and catch an insect in its mouth...too large for the bird to eat...legs hang out of mouth...flew away...yellow stomach...black eye.”

In finalizing the notes, the student adds, “Blue sky day. Sun hot. Pinyon tree.” The notes of themselves are jumbled, but together they create a feeling for the bird, the day, the episode. The final draft read as follows:

“Hot sun fell on the pinyon pine.  
A yellow-bellied bird found it fine.  
It flew up to catch a meal.  
I wonder how eating an insect feels.”

### Describing What You Saw

Lastly, students use their notes to compose a piece of writing that describes what they saw. The format can be of their own choosing, or modeled after the writing of one of the authors in Part One. The emphasis can be scientific: describe what you saw. Or the writing may be more creative: describe a feeling, mood, or image from what you saw.

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## Conclusion

This three-part activity encourages the skills of “seeing” and “observing” wildlife, while also encouraging writing and language arts skills.

The writing of the class can be incorporated into a group book, arranged into a collage on a bulletin board, or formatted on a computer disk as part of a final draft. Artwork can be added into these writings as well.

# Stalking

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## Age Level

4th through 8th grades. However, with modifications of distance, younger and older groups will also enjoy and learn from this exercise.



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## Purpose of the Activity

“Stalking” is an activity that simulates a predator-prey relationship in order to illustrate the degree of inter-connectedness between the predator and the prey. Through it, students come to appreciate the adaptations for survival of both predator and prey. Observation and listening skills are also enhanced through “stalking”.

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## Amount of Time Required

15 to 30 minutes.

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## Materials Needed

None.

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## Best Location

An open space is needed so that predators (students) can see their prey (adult chaperone or teacher). A distance of 20 - 30 feet is recommended for the stalking area, but other spaces may also work. Trailheads or wide areas on slickrock will work. Remember to choose your location so that fragile cryptobiotic soil crusts will not be trampled. Alternatively, this activity may be done on a playing field at school.

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## Background Information

“Stalking” is an excellent warm-up to get a group working together and in high spirits. It is also effective as a “filler”, where students have been concentrating on a subject, and now need to let off steam. Lastly, it is a useful concluding activity, since many themes can be integrated into it. Be aware that it can become boisterous, with the students enjoying the role reversal of themselves as predators, and the adult leader as their prey.

“Stalking” focuses on the predator-prey relationship of the mountain lion and the mule deer. While mountain lions are known to eat other animals, including rabbits, rodents, beavers, porcupines, and skunks, their dominant food source is deer. Contrary to what some people think, lions often cull the old, weak, sick, or injured members from a herd of deer. Wildlife researchers feel that this creates a positive connection between these two animals, as one gets food, while the overall health and strength of the deer population is maintained.

# Stalking



A lion does not usually move quickly to a kill. It watches the herd, looking for a target, and then follows stealthily along getting closer and closer. This stalking may last for minutes to hours, as the lion avoids unnecessary noise and motion that might scare its quarry away. Going slowly also helps the lion to conserve its energy for a final burst of activity during the capture. Creeping nearer to its target, it waits for the right moment to spring up onto the back of the deer. Using its strong front paws and claws, it grabs the deer around the throat and quickly breaks the neck. Death is swift.

Afterwards, the lion may drag its prey to a safer location for feeding. When sated, it buries the carcass under leaves, dirt, or branches to save it for a later feeding. Then it may find a sheltered spot nearby to clean itself, rest, and digest.

For those students who are animal lovers, vegetarians, or animal rights advocates, the teacher may want to emphasize the difference between the “kill for the thrill” of a domestic cat, which, in many cases, has no need of the bird for food; and the “kill for survival” of the mountain lion. Discussions of what would happen if large predators were eliminated from nature are most appropriate in the context of this activity. On one hand, we say we love animals and wildlife. On the other, we are uncomfortable with what they may do to survive, and by how close to us they may be. Watching African lions and cheetahs hunt and kill on television is tolerable, but we do not want animals hunting in our own backyard! Where do these attitudes lead us? What can happen to the deer population — or any other — with no checks on its numbers? What effect would the deer have on the land if their numbers grew dramatically? Who and what else might be affected? Many valuable lessons and discussions are touched on by this simple, fun game.

## How to Do the Activity

### Recruit an Assistant

Before you begin, discuss the “Stalking” activity with the chaperones for your group. Recruit one person to monitor the student “predators”, and not let them get going too quickly. If a chaperone has a good sense of humor, and doesn’t mind taking the limelight for a while, then you can appoint that person as the “DEER” (prey), and you can be the monitor. This is something that the teacher will have to gauge for himself or herself. Is it better for you to monitor, or better for the students to have the thrill of hunting you?

### Step-by-Step Instructions

**1** Introduce the activity by asking students to list as many predator-prey relationships as they can. Encourage them to think of global as well as local connections. Classic examples include:

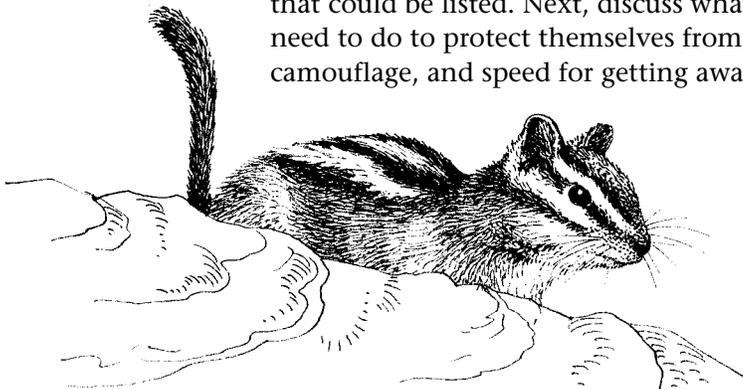
- ~ lions and impalas;
- ~ snakes and mice;
- ~ grizzly bears and salmon;
- ~ golden eagles and rabbits;
- ~ domestic cats and birds.

The latter is a predator-prey relationship of complex and emotional proportions. See Extensions for more about cats and birds that involves deductive reasoning as well as math skills.

**2** Carefully choose the location for this game, and be sure to establish some boundaries. Students like to spread out, and in no time someone can wander off.

### Discuss Predator-Prey Relationships

**3** Explain how the game is played by asking how predators catch their food. What are the most important skills for a predator to have to catch their prey? Surprise, stealth, patience, persistence, skill, speed, strength are among the qualities that could be listed. Next, discuss what prey, such as rodents, birds, and insects, need to do to protect themselves from being eaten. Good eyesight and hearing, camouflage, and speed for getting away are all useful.



**4** Review what was learned in warm-up exercises such as “Quiet Voices” or “The Ears Have It”. (Both of these are described in the “Developing Wildlife Viewing Skills” activity earlier in this chapter.)

## How “Stalking” Works

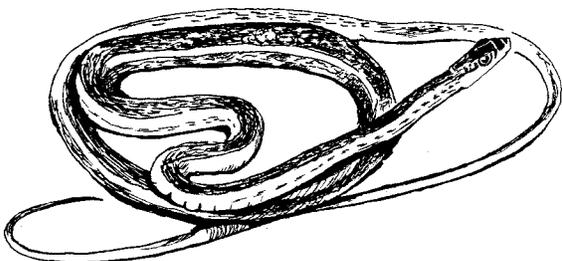
**5** With this background, explain how “Stalking” works. The students will be the “predators” — mountain lions — which are hunting for food. They must sneak up on their “prey” — a mule deer — in order to catch it for food. (The mule deer, incidentally, happens to be the teacher.) At this point the rules of the game must be given, or the students will be so eager to test their predatory skills that they will not listen, and a melee will result. It may anyway, but that, too, is a lesson.

## The Rules

- ~ The object of this activity is to sneak up on the “prey” and catch it, without being caught yourself.
- ~ Whoever gets to the “prey” first, without being heard or seen, is the winner. (This is harder than it looks, because the mule deer has excellent hearing, and is always alert for danger, even when feeding. The mule deer also has good vision, and is sensitive to the slightest unexpected movement in the habitat around it.)
- ~ “Predators” should be as quiet as possible, and watch where and how they step.
- ~ If the “prey” hears a “predator”, it will quickly turn around and point in the direction of the sound. Whoever is closest to that place is caught, and is immediately out of the game. No arguments allowed.
- ~ The monitor will tell the predators when to start, and will have the final say in resolving any disputes about someone being heard or seen. The monitor will move along with the group to keep track of things.

**6** Appoint the students as “predators” (mountain lions) from here on. They will love this idea, and may take some calming before proceeding. They must all get behind an imaginary line, and the game cannot begin until everyone is there. Designate the monitor in charge of the game. Lastly, introduce the “prey” (mule deer) who can be either the teacher or a chaperone.

**7** The “prey” should walk about 25 to 30 feet away from the group. When it turns its back and pretends to eat grass is the signal for the “predators” to begin sneaking up on it. If, however, the deer hears the slightest sound, it will turn around and point to where the sound was coming from. The “predator”/student standing nearest to that point is caught, and is automatically out of the game. When the deer turns around, everyone else must freeze in place. After the “predator” who was caught moves out of the area, the game resumes: the “prey” goes back to eating grass with its back turned, and the “predators” begin sneaking up again. It is repeated over and over until all “predators” are out, or until the “prey” is tagged by one of the mountain lions.



8 The monitor's role is to start the game, and once it is proceeding, to keep watch on the "predators" so that they stay within the boundaries. If disputes arise about who really made a noise, the monitor has the final say. Lastly, the monitor must remind the "predators" that have been caught to remain quiet so that the rest of the game can be completed.

9 No outcome to this game can be predicted. Sometimes, many students get caught in the first few steps. After that, the remaining bunch gets sneakier. Ironically, those who are most shy in the group have the advantage, as they are slower to move, and therefore less noisy! More than once, the most timid person has turned out to be the finest predator, as she/he uses the most caution and patience. Naturally, there will be a few who burst forth to try to catch their "prey" with speed. They may or may not be successful. You can discuss these different strategies after the game.

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## Conclusion

Everyone, young and old, adult and child, will have great fun with the "stalking" activity, and want to continue doing it over and over. Students really do learn valuable lessons about predators, prey, and the interconnectedness of wild animals at the same time as they have fun.

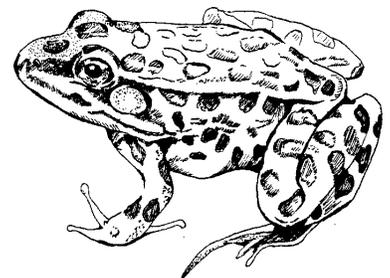
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## Extensions

This game works well for all ages, from kindergarten on up. With younger students, use less distance between predator and prey, and let them have fun playing this unique version of red light-green light. With older groups, more complex lessons from school curricula or from the other extensions can be integrated with the "stalking". The discussion about predators and prey could be a lesson in the classroom before or after the field trip. No matter what the age, sneaking up on something in the grass, or across rock is challenging and fun.

## Wildlife videos

Wildlife videos, including presentations from NOVA, the National Audubon Society, and others can complement this activity well.



## Researching predator-prey relationships

Students work in teams or as individuals to research and write a report on a predator-prey relationship that interests them. Information to cover are methods that predators use to capture prey, and strategies that prey have to avoid being captured. Adaptations of predators to local food and environmental conditions could also be included. For example, coyotes, foxes, raccoons, skunks, and deer all have come to live on the fringes of human communities, because they have come to eat our leavings (garbage), our crops (alfalfa, corn, orchard fruit), even our gardens.

## Literature and media review of predator-prey relationships

Teams of students develop a list of predator-prey relationships that can be found in literature, comic books, movies, videos, Nintendo, television, and other cultural materials. Research can be done by going through the card catalog at the school library; visiting a video store; going through the television channel guide. Examples of classic relationships can be found in the works of Beatrice Potter and Rudyard Kipling, the Disney movie, "The Fox and the Hound", and even the cartoon "Garfield". Students report these back to the class several days later.

## Domestic cats and birds: A mathematical and environmental puzzle

Domestic cats and wild birds are a predator-prey relationship that is familiar to many people. In this activity, students use the mathematical skills of computation, estimation, and data analysis to assess the impact of domestic cats on the wild bird population.

**1** Begin by finding out who has a domestic cat at home. List that number of cats on the chalkboard. Ask the number of students in the class, and place that number below the number of cats on the board. Make these two numbers into a fraction. This becomes the "rate of cats".

**2** Next, find out from the cat owners the number of cats that like to catch birds. Get an estimate of how many birds are caught in a day. Record these numbers on the board. Ask students to compute the number of birds caught in a year if the cats catch them at a steady rate of \_\_\_ / day. This becomes the "capture rate".

**3** If 110,000 people live in Mesa County, how many of them own cats? Use the "rate of cats" (from #1) to project the number of cats in the county. If the cats in Mesa County capture birds at the same rate as those in the classroom, how many wild birds are killed by cats each year in the county? If that figure seems high, you may want to adjust it by figuring that 15% of the cats in the county do not go outside, and 10% more are too old or too slow to catch birds. What, then, is 75% of the original estimation? If the remainder of those cats each capture one bird per day, how many birds per year is that? If there are 10 million cats nationwide, and they, too, catch a bird a day, how many wild birds per year are lost?

While this figure may seem inflated, remember that no one really has an accurate count of the cat population. Conservative estimates are 50 - 60 million cats, and that figure is from 1991!<sup>1</sup> Neither is there an accurate estimate of the number of feral cats, those that live outdoors but may have minimal human contact, or those born in the wild. Imagine the impact that these predators have on small rodents, birds, reptiles and amphibians!

Figures like these have been a wake-up call to many bird lovers and bird researchers. What is the best way to handle the conflict between our long-time love affair with cats, and our rapidly growing hobby of attracting birds to our backyards? Rich Stallcup, an avid bird-watcher and preeminent bird researcher in California, has written numerous articles in recent years on this subject. He calls the impact of domestic cats on the bird population a “reversible *catastrophe*”.<sup>2</sup> Among his suggestions of what to do to help save wild birds from cats are:

- ~ Proclaim your yard a refuge for birds. Plant it for wildlife, and defend it against interloping cats.
- ~ Reduce your cat’s ability to catch birds by keeping it in the house as much as possible. If your cat goes outside, attach bells (more than one is necessary) to its collar to help birds hear the cat as it approaches.
- ~ Discourage your cat from hunting wildlife by squirting it with water when it even thinks about stalking birds. It will still love you.<sup>3</sup>

<sup>1</sup> Stallcup, Richard “A Reversible Catastrophe: Cats Take a Heavy Toll”. The Observer. Quarterly Newsletter of the Point Reyes Bird Observatory . Stinson Beach, California. Spring- Summer, 1991. p. 8 - 11.

<sup>2</sup> Ibid p. 10.

<sup>3</sup> Ibid p. 11.

# Who Lives Here?

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## Age Level

4th through 8th grades.



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## Purpose of the Activity

To improve observation skills, and to increase appreciation for the many signs of wildlife that can be found in nature.

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## Amount of Time Required

45 minutes to 2 hours. This activity is especially effective if used as one element on an all-day hike.

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## Materials Needed

- Sticks — 5 for each child. (Bamboo skewers work well, and are available in most grocery stores,.)
- Bright yarn or survey tape — 5 inch strips are needed to tie onto each stick so they look like small flags.
- Markers — for making designs on the sticks to aid in recognizing them.
- Rubber bands or string — to hold flags together.
- Optional: Big piece of paper and markers for recording findings.

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## Best Location for Activity

Lower Monument Canyon, Upper Liberty Cap, or Black Ridge Trails are good places for this activity. Since the leader needs to see all that is going on, an open area with clear boundaries that are easily recognized is important. The site should have a variety of trees, shrubs, grass, and rocks to make it interesting for the students. Along a drainage or where two habitats meet, can be ideal places for this activity. Choose sites carefully, and do not send children into areas with cryptobiotic soil crust.

# Who Lives Here?



## **Background Information**

Children can find amazing things when they slow down and really look. “Who Lives Here?” gives students a controlled freedom that can result in marvelous discoveries. Later, when they share with the group what they encountered, students feel a sense of satisfaction and pride. The leader’s interest and enthusiasm about the finds encourages students to seek still more. Often these small finds set the stage for great observations and wildlife sightings later on.

Since the focus of this activity is discovery, an expertise in wildlife and plant identification is not required. While it is helpful to recognize that a cone-shaped hill of soil and pebbles is an ant hill, knowledge of ant biology is not necessary at this level. It is more important to spot tracks, scat, feathers, nests, and burrows than it is to know to whom they belong. Many field guides to wildlife identification are readily available, and can be brought along if desired. The “Wildlife Biographies” in Background Information for Teachers, and “Animal Signs and Stories” handouts in the Activities section may also be helpful to review.

## How to Do the Activity

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### Step-by-Step Instructions

#### Preparations

**1** Be sure to preview the trail and area where you will be conducting the activity. Exploring on your own beforehand will give you ideas and information on what is living in the area. Take time to plan out the sites for the students to explore. You will need one area for every two children. It may be helpful for you to make a written record or map of the locations that you choose.

**2** Take time in the classroom to:

- ~ Discuss the type of environment you will visit, and the kinds of wildlife that you might see there. List them on the board. Remember the smaller creatures, such as rodents, birds, spiders and insects. The point of this activity is to encourage students to discover the **multiplicity** of things that are around them, not just the most exciting wildlife.
- ~ Brainstorm different signs that wildlife might leave behind. Tracks, fur, scat, nests, webs, feathers, dens, burrows, scratchings, bones, chewings on leaves, cocoons, galls, and flattened areas in the grass are all signs that wildlife is using, or has used, an area. These can be as exciting to find as the animal itself, for each one is part of the life and story of that creature.

**3** *Several days before the trip*, make the following preparations. Explain to the class that on their upcoming field trip they will be doing an activity called “Who Lives Here?”. Working in teams of two, they will hunt for signs of wildlife along the trail. To mark their discoveries, the teams need “flags” to put in the ground.

#### Make Flags in the Classroom

**4** *Directions for “flags”*: Pass out ten sticks or bamboo skewers, and ten strips of yarn or survey tape, to each team. Also pass out colored markers to each team. Team members should tie the yarn strips securely onto the skewers. (Double knots are recommended.) Teams should choose a design to color on their flags to identify them as their own. These marks, whether patterns, symbols or numbers, must be put consistently on each flag to aid in recognizing them on the ground. When these tasks are completed, secure each team’s flags together with a rubber band and save them for the field trip.

## **The Day of the Activity**

Before the activity begins, *enlist the active participation of the chaperones/accompanying adults*. Make sure that they understand that you will need their help monitoring the team exploration segment, and assisting with group management. You may even want to assign several teams for each adult to oversee specifically.

## **Give Clear Directions**

*Give clear directions*, and set still clearer expectations. The freedom of this activity necessitates control for those who are easily excited and eager. Protecting the students from the resource and the resource from the students requires firm physical and behavioral boundaries.

## **Importance of Physical Boundaries**

Physical boundaries should be understood by all. No one will go past the rock on the trail, into the drainage, or back down the trail past the big cottonwood tree are some typical boundary markers to choose. The teacher also needs to make an understanding with the group that no one will go climbing on rocks, trees, or into unsafe situations.

## **Do Not Touch or Disturb Wildlife**

Some words of warning about touching, catching, or collecting wildlife are essential. As a part of the National Park Service, Colorado National Monument does not allow collecting of rocks, plants, artifacts, bones, lizards, insects, bird feathers, or any other “treasures” found within its boundaries. Everything is protected under federal law so that they may remain part of the complex of ecosystems in the National Parks, into the future. By leaving things as they are, visitors have a remarkable opportunity to ensure that our children and their descendants can also visit and appreciate the marvels that we discover today. Thus, if students find something special along a trail, be it a rock, flower, lizard, or insect, look at it, enjoy it, and mark it with a flag. Show it to others in the group, but leave it where it is.

Another element of protecting the resource and the student is the rule: Do not disturb wildlife. This includes things big and small, mammals, birds, amphibians, reptiles, fish, even tiny insects, and spiders. This means that splashing in a creek where frogs have laid their eggs is not acceptable. Climbing on a rock where peregrine falcons or other birds are nesting, or throwing rocks to make a rabbit or snake move, are forbidden. For your safety, do not pet, feed, or handle any wildlife. Some animals can carry disease, while others can inflict painful bites. If you do spot wildlife in the monument, stop, stand still, and watch it. By keeping your noise and movements to a minimum, you may be able to observe a lizard catching a fly, a deer chewing its cud, a raven bringing nesting material to its mate. Thousands of stories and dramas unfold around the monument every day. See how many your team can discover.

## Protect Cryptobiotic Soil Crust

Protect cryptobiotic soil crust. Do not walk on these fragile black-to-brown-to-gray crusts growing on the soil and under trees.

Cryptobiotic soil crust is a fascinating assemblage of plants, algae, fungi, and lichens that is marvelously adapted to survive under harsh conditions with little water. It pioneers the creation of soils, growing, aerating, penetrating, and improving dry desert sands for the benefit of other plants. To continue its vital role, this tiny, fragile habitat needs protection. Not only must we be careful where we step, but we must remember that we are only visitors to these soils. Our passage through this environment should benefit it, not destroy it. For more information on this fascinating and vulnerable soil crust, look in the chapter on Plants for the activity, "The Magic of a Drop of Water."

Consequences of inappropriate or unsafe behavior are often most effective when determined by the students themselves. If this approach is not appropriate for a group, then the teacher may want to state that teams that do not follow the activity will sit out the remainder of the exploration. All groups having adults visible and involved to answer questions or help with problems makes a big difference.

The activity begins with directions to the teams. For some groups, acting out exactly what will happen on a small scale will be useful.

When the group arrives at the area chosen by the teacher to explore, each team (and their flags) will be taken to a predetermined site.

On "their territory", the team has 15 - 20 minutes to explore, and find as many signs of wildlife use as possible. Every time the team members find an animal home, track, scat, or other sign, they should place a flag in the ground by it.

Nothing should be moved or disturbed in this process. A marker is merely placed nearby to indicate the discovery. If wildlife is seen, a flag can be placed to designate its location. After the territory has been fully explored, and all flags placed, the team may return to the leader leaving their flags behind. Part One is now complete

**Note:** Placing the flags should NOT to be done quickly. Each team must do a careful inspection of their lands so that nothing is overlooked. Some sites may have fewer than ten signs of animal usage. That is all right.

In Part Two, teams switch sites. For example, Team 1 goes to Team 4's site; Team 2 to Team 5's location, etc.. The exchange of site is based on the timing of teams' returns to the teacher. Those done first go out to another site first.

# Who Lives Here?



On the second territory, the team hunts for the flags that were placed by the previous team. When a flag is found, team members must look closely in the area to identify what the first team discovered there. Then, the second team PICKS UP the flags from the previous team. If a flag cannot be located, students who get done quickly can help to recover it.

Thus, every team explores two areas. On the first territory, they hunt for signs of wildlife, and place flags by them. On the second, they collect the flags designating wildlife signs found by another team. By visiting both sites, students have the opportunity to know two pieces of land, and to see how wildlife usage may be similar — or different — on each one.

A vital third part of “Who Lives Here?” is a review of what was discovered by the teams. It may be done in the classroom after the field trip, or it may be done in the field as part of the activity. The latter has the advantage of the information being fresh in the minds of the students, resulting in their making better connections and seeing more patterns.

After all the flags have been located, gather the teams back together to share what they saw and learned. The teacher may want to use a large sheet of paper and a marker to make a map of all the territories, and list the sightings of each team on it. Next, ask the teams to evaluate their findings, especially noticing patterns of wildlife usage. Team C may have 15 signs of animal usage within their area, where Team D found only three. Why would that be? Is it because there is a cottontail burrow, therefore numerous tracks and scat on Team C’s land? Is it because there is less accessible (therefore less usable) terrain on Team D’s territory? Deer tracks were on ten of the twelve sites. Why would that be? What does the plant life look like on the ten sites with deer tracks? What does it look like on the other two? Where does the drainage run? How does its presence affect patterns of wildlife usage? These and many more questions may be addressed in the analysis portion of “Who Lives Here.” This component of the activity is very reminiscent of what wildlife biologists and land use planners do when they make studies of a piece of land.

# Who Lives Here?



## Tips for making the exercise go smoothly:

- ~ Teams should be well spaced so that territories do not overlap.
- ~ Flags should be placed at any sign of wildlife or wildlife use. The uses do not have to be fresh. For example, a spider web, an ant hill, unknown mammal scat, an old woodrat nest in rock, recent diggings under a rock, an old bone, a tiny bird hiding in a sage brush, and a lizard with a long tail on a rock might all be found on one piece of land.
- ~ The teacher should encourage the class to make their “best guess” when trying to identify sign or object. The point of this exercise is to encourage and foster observation, a skill that is critical to the success of any wildlife biologist or animal behaviorist. No doubt there will be a range of knowledge within the class. Where discussions or differences come up, settle them with a reference to a field guide, or by validating that many possibilities exist because we did not see exactly who made the track or scat. Guesses and “guesstimates” about what made the track or dropped the feather are all valid.
- ~ Emphasize that flags should be placed so that they are visible, and easily retrieved.
- ~ If a team gets done too quickly, send them back to look for more signs in their area. Have them report back to you with any additional sightings they make. No more flags need to be put out.
- ~ If the teacher uses the large piece of paper for mapping, he or she may want to draw a diagram of the area while the students are out on their territories, or complete it from field notes before the outing.
- ~ Before leaving the area, make sure that all flags have been found and properly stored in packs. No trash or signs of the group’s visit should be visible.

# Who Lives Here?

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## Conclusion

“Who Lives Here?” is an exploration of an area that is used by wildlife now and in the past. Students are given freedom to explore their piece of land for signs of what has used the trees, shrubs, plants, grasses, rocks, and soil. By marking their discoveries with a “flag”, they allow others to visit their site and see things through another person’s eyes. Discussions and mapping of what was found offer opportunities for comparison of information. Patterns of wildlife use, challenges of topography, and conditions that make a piece of land usable for a variety of creatures are all brought forth through this activity. While the discoveries must take place in the field, numerous opportunities for classroom follow-up, and integration of science, math, and language arts curriculum are available.

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## Extensions

**1** Map-making. Students use a blank piece of paper to draw in topographic features of their territory on it. Trees, rocks, drainages may all be recorded with simple shapes or words. Then, using different colored pencils or markers, students draw in the wildlife signs that they found, and their locations. This activity can be done by memory after the activity, or on site with older students. Maps can be compiled into a collage that represents the area as a whole. Another option is to organize the maps in relation to each other, much like assembling a large puzzle. Together the group looks for patterns of use and pathways that might link the different areas.

**2** Research reports on the animal signs and tracks may be done in the classroom. Each team picks a track, scat, feather, nest, or other wildlife sign that they want to learn more about. Using the school library, area libraries, bookstores, and even the Internet, they can search for information about their chosen subject. An open pinyon cone could lead one team to research pinyon trees, and another to learn about rodents of the area, or pinyon jays. The reports could be written, produced as plays, given orally, or shared in a variety of methods that the students choose.

# Wildlife Observation Sheet



1. Name of creature seen (if known): \_\_\_\_\_

2. Number of creatures seen: \_\_\_\_\_

3. How well did you see the creature? (Check one of the answers.)

- Excellent view (could see creature close up and in detail)
- Good view (could recognize creature and what it was doing)
- Saw briefly (creature was moving and in sight for a short time)
- Heard only (sound of creature was heard: i.e. coyote, great horned owl, woodpecker, etc.)

4. Location: (Please be as specific as possible. For example: Seen on Rim Rock Drive, just below canyon rim, at Cold Shivers Overlook.)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

5. Date and time of sighting: \_\_\_\_\_

6. Weather conditions at time of sighting: \_\_\_\_\_

7. What was the creature doing when seen?

(For example: sitting, flying, sleeping, basking in sun, etc.)

\_\_\_\_\_  
\_\_\_\_\_

8. Have you ever seen the creature before?     yes     no

9. Check the signs of the animal's activity or territory that you saw.

- |  |                                       |                                      |
|--|---------------------------------------|--------------------------------------|
| <input type="checkbox"/> Nest/burrow   | <input type="checkbox"/> Tracks       | <input type="checkbox"/> Scat        |
| <input type="checkbox"/> Bedding areas | <input type="checkbox"/> Diggings     | <input type="checkbox"/> Rubbings    |
| <input type="checkbox"/> Fur/feathers  | <input type="checkbox"/> Food remains | <input type="checkbox"/> Other _____ |

10. Comments or description of creature:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Your Name \_\_\_\_\_

Town/State \_\_\_\_\_

School/Class \_\_\_\_\_ Date of this report \_\_\_\_\_

# Animal Signs



CONTENT STANDARDS	4th Grade	5th Grade	6th Grade	7th Grade	8th Grade
<p><b>Language</b></p> <p><b>Arts</b></p> 	<p><b>Standard 1</b></p> <p>Reference Obj.</p> <p>4.26</p> <p>4.04</p> <p>Thinking Obj.</p> <p>4.06</p> <p>4.07</p> <p>4.17</p> <p><b>Standard 3</b></p> <p>4.01</p> <p>4.04</p> <p>4.05</p> <p>4.06</p> <p>4.09</p> <p><b>Standard 4</b></p> <p>Listening Obj.</p> <p>4.01</p> <p>4.02</p> <p>4.05</p> <p>4.06</p> <p>4.08</p> <p>Thinking Obj.</p> <p>4.03</p> <p>4.14</p> <p>4.15</p> <p>4.16</p> <p>4.17</p> <p>4.20</p> <p>4.07</p> <p>4.08</p>	<p><b>Standard 3</b></p> <p>Reading Obj.</p> <p>5.05</p> <p>5.06</p> <p>5.11</p> <p><b>Standard 4</b></p> <p>Listening Obj.</p> <p>5.02</p> <p>5.05</p> <p>5.06</p> <p>Reference Obj.</p> <p>5.18</p> <p>Thinking Obj.</p> <p>3-5.01</p> <p>3-5.04</p> <p>3-5.15</p> <p>3-5.17</p> <p><b>Standard 5</b></p> <p>Reading Obj.</p> <p>5.01</p> <p>5.23</p>	<p><b>Standard 1</b></p> <p>6.20</p> <p>6.22</p> <p>6.25</p> <p><b>Standard 2</b></p> <p>6.18</p> <p><b>Standard 3</b></p> <p>6.01</p> <p>6.06</p> <p><b>Standard 4</b></p> <p>6.34</p> <p>6.35</p>	<p><b>Standard 1</b></p> <p>7.15</p> <p>7.19</p> <p>7.22</p> <p>7.43</p> <p><b>Standard 4</b></p> <p>7.01</p> <p>7.24</p>	<p><b>Standard 4</b></p> <p>8.01</p> <p>8.14</p> <p>8.17</p> <p>8.20</p>
<p><b>Math</b></p> 	<p><b>Standard 1</b></p> <p>4.1.3</p> <p><b>Standard 3</b></p> <p>4.3.1</p>	<p><b>Standard 2</b></p> <p>2.1</p> <p><b>Standard 3</b></p> <p>3.4</p> <p>3.5</p> <p>3.6</p> <p>3.7</p> <p><b>Standard 4</b></p> <p>5.4.1</p> <p><b>Standard 5</b></p> <p>5.2</p> <p>5.6</p>	<p><b>Standard 4</b></p> <p>4.1</p> <p><b>Standard 5</b></p> <p>5.2</p> <p>5.6</p>	<p><b>Standard 5</b></p> <p>5.2</p> <p>5.6</p>	<p><b>Standard 2</b></p> <p>2.1</p> <p><b>Standard 3</b></p> <p>3.1</p> <p>3.4</p> <p>3.5</p> <p>3.6</p> <p>3.7</p> <p><b>Standard 5</b></p> <p>5.2</p> <p>5.6</p>

# Animal Signs



CONTENT STANDARDS	4th Grade	5th Grade	6th Grade	7th Grade	8th Grade
<p><b>Science</b></p> 	<p><b>Standard 1</b> 1.01 1.02 1.03 1.04</p> <p><b>Standard 2</b> <b>2.1</b> 2.11 2.12</p> <p><b>Standard 3</b> <b>3.1</b> 3.12 3.14 <b>3.2</b> 3.22 <b>3.3</b> 3.33 <b>3.4</b> 3.43</p> <p><b>Standard 5</b> 5.01 5.05</p> <p><b>Standard 6</b> 6.03</p> <p><b>Standard 7</b> 7.04 7.05</p>	<p><b>Standard 1</b> 1.03 1.05 1.06 1.07 1.08</p> <p><b>Standard 2</b> <b>2.1</b> 2.11</p> <p><b>Standard 3</b> <b>3.1</b> 3.11 3.12 3.13 3.15 <b>3.2</b> 3.22 <b>3.4</b> 3.43</p> <p><b>Standard 5</b> 5.04</p> <p><b>Standard 6</b> 6.01 6.02</p> <p><b>Standard 7</b> 7.02 7.05 7.06</p>	<p><b>Standard 1</b> 6.1.03 6.1.04 6.1.05 6.1.06 6.1.07 6.1.08 6.1.12</p> <p><b>Standard 2</b> <b>2.1</b> 6.2.01</p> <p><b>Standard 3</b> 3.1</p> <p><b>Standard 5</b> 6.5.03</p> <p><b>Standard 7</b> 6.7.02 6.7.05 6.7.06</p>	<p><b>Standard 1</b> 7.1.03 7.1.04 7.1.05 7.1.06 7.1.07 7.1.08 7.1.12</p> <p><b>Standard 2</b> <b>2.1</b> 7.2.01</p> <p><b>Standard 3</b> <b>3.1</b> 7.3.01</p> <p><b>Standard 5</b> 7.5.03</p> <p><b>Standard 7</b> 7.7.05 7.7.06</p>	<p><b>Standard 1</b> 8.1.03 8.1.05 8.1.06 8.1.07 8.1.08</p> <p><b>Standard 2</b> <b>2.1</b> 8.2.01</p> <p><b>Standard 3</b> <b>3.1</b> 8.3.01 8.3.02 8.3.03</p> <p><b>Standard 5</b> 8.5.03</p> <p><b>Standard 7</b> 8.7.05 8.7.06</p>
<p><b>Social Studies</b></p> 	<p><b>Geography Standard 2</b> 4.44 4.49</p>	<p><b>Geography Standard 4</b> 5.18 5.38</p>	<p><b>Geography Standard 4</b> <b>4.1</b> 6.35 6.36 <b>4.2</b> 6.38</p>	<p><b>Geography Standard 2</b> <b>2.1</b> 7.35</p>	<p><b>Geography Standard 2</b> <b>2.1</b> 8.18</p> <p><b>Standard 4</b> <b>4.1</b> 8.40</p>

# Lizard Patrol



CONTENT STANDARDS	4th Grade	5th Grade	6th Grade	7th Grade	8th Grade
<b>Language Arts</b> 	<b>Standard 1</b>	<b>Standard 1</b>	<b>Standard 1</b>	<b>Standard 1</b>	<b>Standard 1</b>
	<u>Writing Obj.</u>	<u>Writing Obj.</u>	6.20	7.15	8.11
	4.07	5.05	6.22	7.19	8.14
	4.08	5.07	6.25	7.21	8.16
	4.12	<u>Speaking Obj.</u>	6.28	7.22	8.17
	<u>Speaking Obj.</u>	5.06	6.29	7.26	8.32
	4.03	5.10	6.37	7.30	8.33
	4.09	<u>Reference Obj.</u>	<b>Standard 2</b>	7.43	<b>Standard 2</b>
	4.10	5.04	6.15	<b>Standard 2</b>	8.12
	<u>Reference Obj.</u>	5.06	6.18	7.16	8.13
	4.04	5.09	6.19	7.17	8.18
	4.07	5.10	6.24	7.18	8.21
	4.26	<u>Thinking Obj.</u>	<b>Standard 3</b>	7.23	<b>Standard 3</b>
	<u>Thinking Obj.</u>	3-5.18	6.01	7.33	8.01
	4.02	<b>Standard 3</b>	6.06	<b>Standard 3</b>	8.02
	4.06	5.05	6.07	7.01	8.03
	4.07	5.06	6.09	7.04	8.04
	4.17	5.09	6.12	7.05	8.06
	<b>Standard 2</b>	5.12	6.14	7.06	8.10
	4.10	<b>Standard 4</b>	<b>Standard 4</b>	7.08	<b>Standard 4</b>
	4.11	<u>Reading Obj.</u>	6.09	<b>Standard 4</b>	8.14
	<b>Standard 3</b>	5.11	6.10	7.11	8.20
	4.05	5.20	6.20	7.12	8.23
	4.08	<u>Listening Obj.</u>	6.21	7.24	
	4.09	5.02	6.22	7.26	
	4.10	5.03	6.25	7.27	
	4.17	5.05	6.27	7.28	
	4.18	5.08	6.28		
4.19	5.09	6.35			
<b>Standard 4</b>	5.10	6.47			
<u>Reading Obj.</u>	<u>Speaking Obj.</u>	<b>Standard 6</b>			
4.09	5.11	6.11			
4.11	<u>Thinking Obj.</u>	6.12			
4.12	3-5.01	6.29			
<u>Listening Obj.</u>	3-5.04				
4.01	3-5.17				
4.02	<b>Standard 5</b>				
4.03	5.17				
4.05	<b>Standard 6</b>				
4.08	5.02				
<b>Standard 5</b>	5.14				
<u>Thinking Obj.</u>	5.16				
4.06	5.21				
4.04	5.19				
4.18					
<b>Standard 6</b>					
4.14					
4.17					
4.18					

# Lizard Patrol



CONTENT STANDARDS	4th Grade	5th Grade	6th Grade	7th Grade	8th Grade
<b>Math</b>					
<b>Science</b> 	<u>Standard 2</u> 2.1 2.11 <u>2.3</u> 2.31 <u>Standard 3</u> 3.1 3.12 3.14 <u>Standard 7</u> 7.04 7.05	<u>Standard 2</u> 2.1 2.11 <u>Standard 3</u> 3.1 3.12 3.14 3.4 3.43 <u>Standard 7</u> 7.05 7.06	<u>Standard 1</u> 6.1.03 6.1.05 6.1.06 6.1.07 6.1.08 6.1.12 <u>Standard 2</u> 2.1 6.2.01 <u>Standard 3</u> 3.1 <u>Standard 7</u> 6.7.02 6.7.05 6.7.06	<u>Standard 1</u> 7.1.03 7.1.05 7.1.06 7.1.07 7.1.08 7.1.12 <u>Standard 2</u> 2.1 7.2.01 <u>Standard 3</u> 3.1 7.3.01 7.3.02 7.3.03 3.2 7.3.04 <u>Standard 7</u> 7.7.02 7.7.05 7.7.07	<u>Standard 1</u> 8.1.03 8.1.05 8.1.06 8.1.07 8.1.08 8.1.12 <u>Standard 2</u> 2.1 8.2.01 <u>Standard 3</u> 3.1 8.3.02 8.3.03 <u>Standard 7</u> 8.7.02 8.7.05 8.7.06
<b>Social Studies</b> 	<u>Geography Standard 2</u> 4.46 4.47 <u>Standard 4</u> 4.64 4.67	<u>Geography Standard 1</u> 5.18 <u>Standard 4</u> 5.18 5.38	<u>Geography Standard 4</u> 2.1 6.21 4.1 6.35 4.2 6.38	<u>Geography Standard 2</u> 2.1 7.35 7.36 <u>Standard 4</u> 4.1 7.59 7.60 4.2 7.62 7.63	<u>Geography Standard 2</u> 2.1 8.18 8.19 <u>Standard 4</u> 4.1 8.40 8.41

# Stalking



CONTENT STANDARDS	4th Grade	5th Grade	6th Grade	7th Grade	8th Grade
<b>Language Arts</b> 	<b>Standard 4</b> <b>Listening Obj.</b> 4.01 4.05 4.06 4.08 <b>Thinking Obj.</b> 4.15	<b>Standard 4</b> <b>Listening Obj.</b> 5.02 5.05 5.08 <b>Thinking Obj.</b> 3.5.15	<b>Standard 4</b> 6.06 6.09 6.25	<b>Standard 4</b> 7.24	<b>Standard 4</b> 8.23
<b>Math</b>					
<b>Science</b> 	<b>Standard 3</b> 3.1 3.12 3.14 <b>3.2</b> 3.22 <b>Standard 6</b> 6.02	<b>Standard 3</b> 3.1 3.12 3.13 <b>3.2</b> 3.22 3.24 3.4 3.43	<b>Standard 7</b> 6.7.02 6.7.03	<b>Standard 3</b> 3.1 7.3.01 7.3.02 <b>3.2</b> 7.3.06 <b>Standard 7</b> 7.7.02 7.7.03	<b>Standard 3</b> 3.1 8.3.03 <b>Standard 7</b> 7.7.02 7.7.03
<b>Social Studies</b> 	<b>Geography Standard 2</b> 4.46 4.47 <b>Standard 4</b> 4.67	<b>Geography Standard 4</b> 5.18 5.38	<b>Geography Standard 4</b> 6.35 6.36	<b>Geography Standard 4</b> 7.59 7.60 7.62 7.63	<b>Geography Standard 4</b> 8.40 8.41

# Who Lives Here?



CONTENT STANDARDS	4th Grade	5th Grade	6th Grade	7th Grade	8th Grade
<p><b>Language</b></p> <p><b>Arts</b></p>	<p><b>Standard 1</b></p> <p><u>Speaking Obj.</u></p> <p>4.06</p> <p>4.10</p> <p>4.09</p> <p><u>Reference Obj.</u></p> <p>4.26</p> <p><u>Thinking Obj.</u></p> <p>4.02</p> <p>4.06</p> <p>4.07</p> <p><b>Standard 4</b></p> <p><u>Listening Obj.</u></p> <p>4.01</p> <p>4.05</p> <p>4.08</p> <p><u>Thinking Obj.</u></p> <p>4.03</p> <p>4.14</p> <p>4.16</p> <p>4.07</p> <p>4.08</p> <p><b>Standard 5</b></p> <p><u>Thinking Obj.</u></p> <p>4.06</p>	<p><b>Standard 1</b></p> <p>5.03</p> <p>5.01</p> <p>5.06</p> <p>5.10</p> <p>3-5.18</p> <p>5.22</p> <p><b>Standard 2</b></p> <p>5.08</p> <p><b>Standard 4</b></p> <p><u>Listening Obj.</u></p> <p>5.02</p> <p>5.03</p> <p>5.05</p> <p>5.08</p> <p><u>Speaking Obj.</u></p> <p>5.11</p> <p><u>Reference Obj.</u></p> <p>5.18</p> <p><u>Thinking Obj.</u></p> <p>3-5.01</p> <p>3-5.04</p> <p>3-5.17</p> <p><b>Standard 5</b></p> <p><u>Thinking Obj.</u></p> <p>5.23</p> <p>5.03</p> <p>5.06</p>	<p><b>Standard 1</b></p> <p>6.25</p> <p>6.29</p> <p><b>Standard 4</b></p> <p>6.25</p> <p>6.27</p> <p>6.28</p> <p>6.33</p> <p>6.34</p> <p>6.35</p>	<p><b>Standard 1</b></p> <p>7.31</p> <p><b>Standard 4</b></p> <p>7.24</p>	<p><b>Standard 4</b></p> <p>8.17</p> <p>8.23</p> <p><b>Standard 5</b></p> <p>8.33</p>
<p><b>Math</b></p>	<p><b>Standard 1</b></p> <p>4.1.3</p> <p>4.1.5</p> <p><b>Standard 3</b></p> <p>4.3.1</p> <p>4.3.2</p> <p>4.3.3</p> <p><b>Standard 5</b></p> <p>4.5.3b</p>	<p><b>Standard 2</b></p> <p>5.2.1</p> <p>5.2.3</p> <p><b>Standard 3</b></p> <p>5.3.1</p> <p>5.3.2</p> <p>5.3.3</p> <p>5.3.4</p> <p>5.3.7</p> <p><b>Standard 5</b></p> <p>5.5.2</p> <p>5.5.3</p> <p>5.5.6</p>	<p><b>Standard 2</b></p> <p>2.1</p> <p>2.2</p> <p><b>Standard 3</b></p> <p>3.1</p> <p>3.3</p> <p>3.4</p> <p>3.5</p> <p>3.6</p> <p>3.7</p> <p>3.7</p> <p><b>Standard 5</b></p> <p>5.2</p> <p>5.3</p> <p>5.6</p>	<p><b>Standard 2</b></p> <p>2.1</p> <p><b>Standard 3</b></p> <p>3.1</p> <p>3.4</p> <p>3.5</p> <p>3.6</p> <p>3.7</p> <p><b>Standard 5</b></p> <p>5.2</p> <p>5.3</p> <p>5.6</p>	<p><b>Standard 2</b></p> <p>2.1</p> <p><b>Standard 3</b></p> <p>3.1</p> <p>3.4</p> <p>3.5</p> <p>3.6</p> <p>3.7</p> <p><b>Standard 5</b></p> <p>5.2</p> <p>5.3</p> <p>5.6</p>

# Who Lives Here?



CONTENT STANDARDS	4th Grade	5th Grade	6th Grade	7th Grade	8th Grade
<p><b>Science</b></p> 	<p><b>Standard 1</b></p> <p>1.01 1.02 1.03 1.04</p> <p><b>Standard 2</b></p> <p><b>2.1</b> 2.11</p> <p><b>Standard 3</b></p> <p><b>3.1</b> 3.12 3.14</p> <p><b>Standard 5</b></p> <p>5.05</p> <p><b>Standard 6</b></p> <p>6.01 6.02 6.03</p> <p><b>Standard 7</b></p> <p>7.01 7.02 7.03 7.04 7.05</p>	<p><b>Standard 1</b></p> <p>1.03 1.05 1.06 1.07 1.08</p> <p><b>Standard 2</b></p> <p><b>2.1</b> 2.11</p> <p><b>Standard 3</b></p> <p><b>3.1</b> 3.11 3.12 3.14 3.15</p> <p><b>3.2</b> 3.22 3.24</p> <p><b>3.4</b> 3.43</p> <p><b>Standard 5</b></p> <p>5.04</p> <p><b>Standard 6</b></p> <p>6.01</p> <p><b>Standard 7</b></p> <p>7.02 7.03 7.05 7.06</p>	<p><b>Standard 1</b></p> <p>6.1.03 6.1.05 6.1.06 6.1.07 6.1.08 6.1.10</p> <p><b>Standard 2</b></p> <p><b>2.1</b> 6.2.01</p> <p><b>2.2</b> 6.2.03</p> <p><b>Standard 5</b></p> <p>6.5.03</p> <p><b>Standard 7</b></p> <p>6.7.05 6.7.06</p>	<p><b>Standard 1</b></p> <p>7.1.03 7.1.05 7.1.06 7.1.07 7.1.08 7.1.12</p> <p><b>Standard 2</b></p> <p><b>2.1</b> 7.2.01</p> <p><b>2.2</b> 7.2.04</p> <p><b>Standard 3</b></p> <p><b>3.1</b> 7.3.01 7.3.03</p> <p><b>Standard 5</b></p> <p>7.5.03</p> <p><b>Standard 7</b></p> <p>7.7.02 7.7.05 7.7.06</p>	<p><b>Standard 1</b></p> <p>8.1.03 8.1.05 8.1.06 8.1.07 8.1.08 8.1.12</p> <p><b>Standard 2</b></p> <p><b>2.1</b> 8.2.01</p> <p><b>2.2</b> 8.2.03</p> <p><b>2.3</b> 8.2.07</p> <p><b>Standard 3</b></p> <p><b>3.1</b> 8.3.01 8.3.02 8.3.03</p> <p><b>Standard 5</b></p> <p>8.5.03</p> <p><b>Standard 7</b></p> <p>8.7.02 8.7.05 8.7.06</p>
<p><b>Social Studies</b></p> 	<p><b>Geography</b></p> <p><b>Standard 2</b></p> <p>4.44 4.46 4.49 4.50 4.52</p> <p><b>Standard 4</b></p> <p>4.63 4.67</p>	<p><b>Geography</b></p> <p><b>Standard 4</b></p> <p>5.18 5.38</p>	<p><b>Geography</b></p> <p><b>Standard 4</b></p> <p><b>4.1</b> 6.35 6.36</p> <p><b>4.2</b> 6.38</p>	<p><b>Geography</b></p> <p><b>Standard 1</b></p> <p><b>1.2</b> 7.26 7.27</p> <p><b>Standard 2</b></p> <p><b>2.1</b> 7.35 7.36</p> <p><b>Standard 4</b></p> <p><b>4.1</b> 7.59 7.60</p> <p><b>4.2</b> 7.62 7.63</p>	<p><b>Geography</b></p> <p><b>Standard 1</b></p> <p><b>1.2</b> 8.14</p> <p><b>Standard 2</b></p> <p><b>2.1</b> 8.18</p>



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## Birds

- Andrews, Robert and Righter, Robert. *Colorado Birds: A Reference To Their Distribution and Habitat*. Denver Museum of Natural History. Denver, Colorado: 1992.
- Dunne, Peter, et al. *Hawks In Flight*. Houghton Mifflin Company. Boston, Massachusetts: 1998.
- Ehrlich, Paul R., et al. *The Birder's Handbook: A Field Guide to the Natural History of North American Birds*. Simon & Schuster, Inc. New York, New York: 1988.
- National Geographic Society. *Field Guide to the Birds of North America*. Second Edition. National Geographic Society. Washington, D.C.: 1987.
- Peterson, Roger Tory. *Peterson Field Guides: Western Birds*. Houghton Mifflin Company. Boston, Massachusetts: 1990.
- Stokes, Donald W. and Lillian Q. *Stokes Nature Guides: A Guide to Bird Behavior*. Volumes 1, 2, and 3. Little, Brown, and Company. Boston, Massachusetts: 1979, 1983, 1989.
- Stokes, Donald W. and Lillian Q. *Stokes Field Guide to Birds (Western Region)*. Little, Brown and Company. Boston, Massachusetts: 1996.

## Mammals

- Armstrong, David M. *Lions, Ferrets, and Bears: A Guide to the Mammals of Colorado*. University of Colorado Museum and the Colorado Division of Wildlife. Denver, Colorado: 1993.
- Baylor, Bird and Parnall, Peter. *Desert Voices*. Aladdin Books. New York, New York: 1981.
- Bentley, Timothy. *Habitat Conservation Planning: Endangered Species and Urban Growth*. University of Texas Press. Austin, Texas: 1994.

- Brady, Irene. *The Redrock Canyon Explorer*. Nature Works. Talent, Oregon: 1998.
- Brown, Tom, Jr.. *Tom Brown's Field Guide to Nature Observation and Tracking*. Berkely Books. New York, New York: 1983.
- Burt, William H. and Grossenheider, Richard. *Peterson Field Guide Series: A Field Guide to the Mammals of America North of Mexico*. Third Edition. Houghton Mifflin Company. Boston, Massachusetts: 1976.
- Colorado Division of Wildlife. *Furbearing Mammals of Colorado*. Colorado Division of Wildlife. Denver, Colorado. Publication date unknown.
- Fadala, Sam. *Basic Projects in Wildlife Watching*. Stackpole Books. Harrisburg, Pennsylvania: 1989.
- Gallegos, Diane H. *Through the Eyes of the Children*. Gallegos and Associates. Grand Junction, Colorado: 1998.
- Grater, Russell. *Discovering Sierra Mammals*. Yosemite Natural History Association and Sequoia Natural History Association in cooperation with the National Park Service, Department of Interior. 1978.
- Halfpenny, James C. *Scats and Tracks of the Rocky Mountains*. Falcon Publishing, Inc. Helena, Montana: 1998.
- Halfpenny, James C. *Scats and Tracks of the Desert Southwest*. Falcon Publishing, Inc. Helena, Montana: 2000.
- Headstrom, Richard. *Suburban Wildlife: An Introduction to the Common Animals of Your Back Yard and Local Park*. Prentice-Hall, Inc. Englewood Cliffs, New Jersey: 1984.
- Jameson, E. W., Jr. and Peeters, Hans. *California Mammals*. University of California Press. Berkeley, California: 1988.

# Bibliography

## Wildlife



- Johnson, David W. *Wildlife of the Canyons: Colorado National Monument and the Colorado Plateau Region*. Colorado National Monument Association. Fruita, Colorado: 1990.
- Lawler, Timothy. *Handbook to the Orders and Families of Living Mammals*. Mad River Press. Eureka, California: 1979.
- Martin, Alexander C., et al. *American Wildlife and Plants: A Guide to Wildlife Food Habits*. Dover Publications. New York, New York: 1951.
- Miller, Arthur P. *Park Ranger Guide to Wildlife*. Stackpole Books. Harrisburg, Pennsylvania: 1990.
- Milord, Susan. *The Kids' Nature Book: 365 Indoor/Outdoor Activities and Experiences*. Williamson Publishing Company. Charlotte, Vermont: 1996.
- Moorhead, Carol Ann. *Colorado's Backyard Wildlife: A Natural History, Ecology, and Action Guide to the Front Range Urban Wildlife*. Roberts Rhinehart Publishers. Niwot, Colorado: 1992.
- Murie, Olaus. *Peterson Field Guide Series: A Field Guide to Animal Tracks*. Second Edition. Houghton Mifflin Company. Boston, Massachusetts: 1974.
- Olin, George. *Mammals of the Southwest Deserts*. Southwest Parks and Monuments Association. Tucson, Arizona: 1982.
- Olin, George. *Mammals of the Southwest Mountains and Mesas*. Southwest Parks and Monuments Association. Globe, Arizona: 1961.
- Owen, Dennis. *Survival in the Wild: Camouflage and Mimicry*. University of Chicago Press. Chicago, Illinois: 1980.
- Pandell, Karen and Stall, Chris. *Animal Tracks of the Pacific Northwest*. The Mountaineers. Seattle, Washington: 1981.
- Ranger Rick's Nature Scope: Amazing Mammals, Part 1*. National Wildlife Federation. Washington, D. C.: 1986.
- Ransom, Jay Ellis, Assembler. *Harper and Row's Complete Field Guide to North American Wildlife*. (Western Edition.) Harper and Row Company. New York, New York: 1981.
- Roth, Charles. *The Wildlife Observer's Guidebook*. Prentice-Hall, Inc. Englewood Cliffs, New Jersey: 1982.
- Russo, Ron and Olhausen, Pam. *Mammal Finder*. Nature Study Guild. Berkeley, California: 1987.
- Shedd, Warner. *The Kids' Wildlife Book*. Williamson Publishing. Charlotte, Virginia: 1994.
- Stokes, Donald and Lillian. *Stokes Nature Guides: A Guide to Animal Tracking and Behavior*. Little Brown and Company. Boston, Massachusetts: 1986.
- Williams, David. *A Naturalist's Guide to Canyon Country*. Falcon Publishing, Inc. Helena, Montana: 2000.
- Young, Mary Taylor. *On the Trail of Colorado Critters*. Denver Museum of Natural History. Denver, Colorado: 2000.
- Zeveloff, Samuel. *Mammals of the Intermountain West*. University of Utah Press. Salt Lake City, Utah: 1988.