

2024 Lancaster County Middle School Envirothon

Wildlife Study Materials

Wildlife	
Northern Goshawk	Barred Owl and Call
Wood Thrush and Call	White-breasted Nuthatch
Scarlet Tanager	Ruffed Grouse and Call
Eastern Towhee and Call	Bobcat / Skull and Track
Fisher	Coyote / Skull and Track
Pine Marten	Gray Fox
Short-tailed Weasel	Allegheny Wood Rat

References:

<http://www.pgc.pa.gov/Education/WildlifeNotesIndex/Pages/default.aspx>

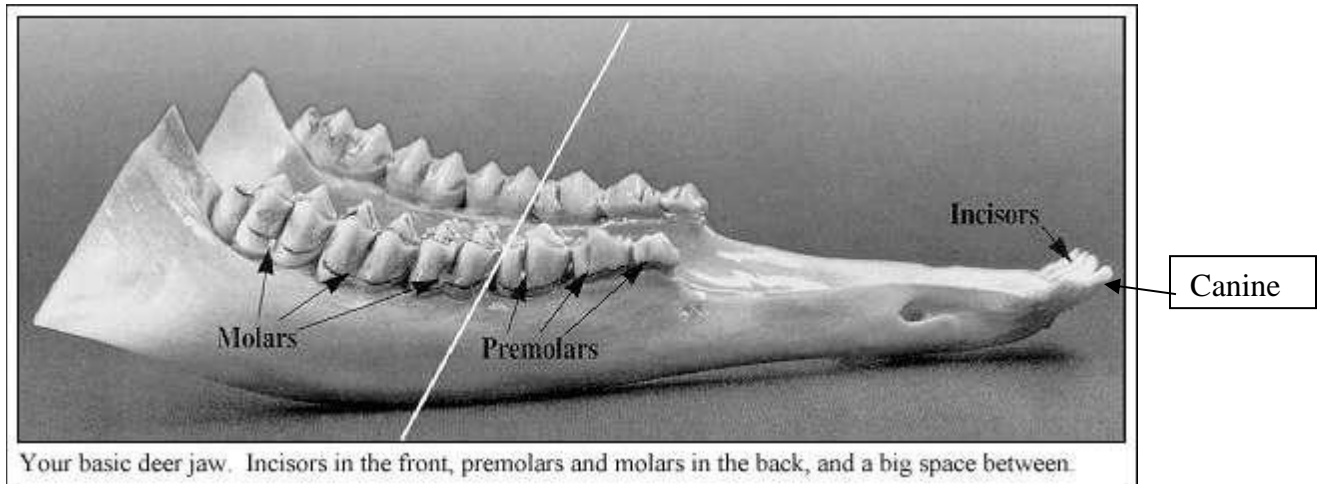
<https://www.allaboutbirds.org/guide/search/>

Bird Call links

For 1 and 2, listen to the sound on the page that opens (green oval). For the Barred Owl (2), listen to the top 3 to hear a variety of typical calls. Listen to the drumming for the Ruffed Grouse (4).

1. Wood Thrush: https://www.allaboutbirds.org/guide/Wood_Thrush
2. Eastern Towhee: https://www.allaboutbirds.org/guide/Eastern_Towhee
3. Barred Owl: https://www.allaboutbirds.org/guide/Barred_Owl/sounds
4. Ruffed Grouse: https://www.allaboutbirds.org/guide/Ruffed_Grouse/sounds

Parts of a Skull: M = Molars, P = Premolars, I = Incisors, C = Canine



Skull/Teeth Identification



Northern Goshawk

The largest of our accipiters, goshawks are 20 to 26 inches long with a wingspread of 40 to 47 inches and weight of 1½ to 3½ pounds. Both immatures and adults have a prominent white line over each eye; the eyes of adults are bright red. Adults are blue-gray above and white below, with light barring on the breast. Immatures are brown above and creamy white below, with heavily streaked undersides. In PA, goshawks are seen in greatest numbers in winter, when food scarcities force many south. Also called “blue darters,” goshawks are swift, maneuverable, and relentless, sometimes pursuing prey — birds and small mammals — through thick underbrush on foot. Goshawks breed in

wooded areas and prefer wild territory, such as the mountainous areas of northern Pennsylvania. They nest up to 75 feet above the ground in trees, building bulky nests (3 to 4 feet in diameter). A pair often uses the same nest year after year. Females lay 3 to 4 off-white and usually unmarked eggs which they alone incubate for 36 to 38 days. Goshawks defend their nests fiercely; the voice is a harsh ca ca ca around the nest.

Fun facts:

- The name goshawk comes from the Old English word for “goose hawk,” a reference to this raptor’s habit of preying on birds. Falconers have trained goshawks for more than 2,000 years; the birds were once called “cook’s hawk” for their success at snaring meat for the pot.
- Northern Goshawk pairs build and maintain up to eight alternate nests within their nesting area. Even with options available, they may use the same nest year after year, or may switch to a new nest after a brood fails. Pairs may add fresh conifer needles to the nest during breeding. Aromatic chemicals (terpenes) in the needles may act as a natural insecticide and fungicide.



Wood Thrush

Mid-April to early May is when the first calls of wood thrushes are likely to be heard percolating through the woods in central Pennsylvania. The flutelike song is usually rendered as ee-o-lay, and it goes on increasingly through May, especially at dawn and dusk. Wood thrushes have reddish heads, olive backs and tails, and prominently spotted breasts; they are not as shy as other forest thrushes nor as bold as robins. Wood thrushes feed on beetles, caterpillars, crickets, ants, moths and sowbugs, plus spiders, earthworms and snails. They also eat many fruits and berries. Wood thrushes nest throughout eastern North America. They are statewide in Pennsylvania in moist lowland woods, dry upland forests, wooded ravines,

orchards, city parks and wooded suburbs. Territories range in size from a quarter of an acre to two acres. The female builds her nest on a branch or in a fork of a tree 6 to 50 feet above ground (on average, 10 feet high), using grasses, moss, bark and leaves cemented together with mud. An inner cup is lined with rootlets. The eggs are pale greenish blue. The young hatch after two weeks and leave the nest some 12 days later. Brown-headed cowbirds frequently parasitize wood thrush nests, although in some cases the foreign young may not affect the growth or success of the host's young. House cats, black rat snakes, flying squirrels, grackles, blue jays, weasels and white-footed mice take eggs, nestlings and young. Wood thrushes stop singing in late summer but continue to sound bwubububub contact notes and bweebbeebeebee alarm calls. They head south in August and September to forests from southeastern Mexico to Panama. The wood thrush population has declined markedly since the 1980s, perhaps because fragmented forests in the Northeast make thrush nests more accessible to predators and to cowbirds, which dwell in more open country. Wood thrushes have also lost crucial habitat through deforestation on their wintering range.

Fun facts:

- A songbird like the Wood Thrush requires 10 to 15 times as much calcium to lay a clutch of eggs as a similar size mammal needs to nurture its young. That makes calcium-rich food supplements like snail shells crucial to successful breeding. These are rare in soils subject to acid rain, which may help explain patterns of population decline in the Wood Thrush.
- The Wood Thrush is a consummate songster and it can sing "internal duets" with itself. In the final trilling phrase of its three-part song, it sings pairs of notes simultaneously, one in each branch of its y-shaped syrinx, or voicebox. The two parts harmonize with each other to produce a haunting, ventriloquial sound.



Scarlet Tanager

Males arrive on the breeding range in southeastern PA from late April to early May, just as trees are beginning to leaf out. Their bodies are red, and their wings and tails are jet-black. Females, which show up a few days later, are a greenish yellow that blends with the leaves in which they rest and feed. Adults are about seven inches in length. Scarlet tanagers favor dry, upland oak woods. They also inhabit mixed and coniferous forests and shade plantings in suburbs and parks. Males claim two- to six-acre territories by singing almost constantly from prominent perches and driving away competing males. Insects and fruits form the bulk of the diet. Scarlet tanagers nest in late May and June. Females forage higher in the tree canopy than males. Both sexes work slowly and methodically, inspecting leaves, twigs, and branches and picking at leaf clusters near the ends of twigs. Scarlet tanagers leave Pennsylvania in September and early October. They migrate mainly through the Caribbean lowlands of Middle America and spend most of the year east of the Andes in remote forests of Colombia, Ecuador, Peru, and Bolivia. Scarlet tanagers nest statewide in Pennsylvania and are more common than many people think. The highest populations occur in mature, extensive forests. Scarlet tanagers are absent from treeless urban areas and intensively farmed lands.

Fun Fact:

- Scarlet Tanagers often play host to eggs of the Brown-headed Cowbird, particularly where the forest habitat has been fragmented. When a pair of tanagers notices a female cowbird approaching, they aggressively drive her away. If they don't notice, the cowbird gets rid of a tanager egg and replaces it with one of her own. The tanagers apparently can't tell the difference, either before or after the egg hatches, and they raise the imposter along with the rest of their brood.



Eastern Towhee

Formerly called the rufous-sided towhee, this large (seven to eight inches), long-tailed sparrow breeds statewide in Pennsylvania. Adults have rusty sides, white bellies, and solid-colored backs and heads that are black in the male and brown in the female. The eyes are red. Males sing a distinctive "drink your tea," with the middle syllable low and the last syllable drawn out and quavering. Both sexes frequently give an emphatic chewink or tow-hee call. A way to locate the birds is to listen for the rustling they make while searching for food in leaf litter. Towhees energetically turn up leaves by hopping backwards, scratching with both feet. They pick up various insects, spiders, millipedes and snails as well as seeds, small fruits, berries and acorns. In April, males arrive from southern states in small bands, disperse, and singing from high perches, proclaim individual territories of one-half to two acres. Females show up about a week later. They scuff out shallow depressions in the ground and build bulky but well-camouflaged nests of leaves, bark strips, and other plant matter, lined with fine grasses and pine needles. In Pennsylvania, towhees nest from late April into August with most pairs producing two broods. The estimated life span of a towhee is four to six years. Eastern towhees are found mainly in second-growth forests, overgrown fields, woods edges, clear-cuts, hedgerows, thickets, dense brush, and the understory of open deciduous woods. The clearing of the Eastern deciduous forests around the turn of the century helped towhee populations to

expand. More recently, as old fields have matured into woods, the population of this species has declined noticeably. Rarely do they live in suburban yards, cities or intensively farmed areas.

Fun fact:

- The Eastern Towhee and the very similar Spotted Towhee of western North America used to be considered the same species, the Rufous-sided Towhee. The two forms still occur together in the Great Plains, where they sometimes interbreed. This is a common evolutionary pattern in North American birds – a holdover from when ice sheets split the continent down the middle, isolating birds into eastern and western populations that eventually became new species.



Barred Owl

The barred owl is a large bird of the deep woods. It has a smooth, rounded head, and brown eyes (it's the only brown-eyed Pennsylvania owl except the barn owl; all others have yellow eyes). The barred owl ranges over the eastern United States, its distribution often coinciding with that of the red-shouldered hawk. A barred owl weighs up to two pounds, with a 44-inch wingspan and body length up to 20 inches. It has gray-brown plumage with white spots on the back; whitish or grayish underparts are barred with buff or deep brown, the barring crosswise on the breast and lengthwise on the belly. The barred is the most vocal of our owls. Its hoots are more emphatic than those of the

great horned owl, but not as deep or booming. The barred owl's call is eight accented hoots, in two groups of four hoots: hoo-hoo-hoo-hoo . . . hoo-hoo-hoo-hoo-aw (described as "Who cooks for you, who cooks for you all?"). It usually calls early in the night, at dawn, and occasionally on cloudy days. Barred owls almost always nest in hollow trees, laying 2-4 eggs that hatch in 28-33 days. Pairs may show strong attachment to the same nest area, returning year after year.

Fun facts:

- Barred Owls don't migrate, and they don't even move around very much. Of 158 birds that were banded and then found later, none had moved farther than 6 miles away.
- Young Barred Owls can climb trees by grasping the bark with their bill and talons, flapping their wings, and walking their way up the trunk.



White-Breasted Nuthatch

The white-breasted nuthatch has a slate-gray back, white breast and face, and a cap that is black in the male and ashy gray in the female. Nuthatches inhabit deciduous forests throughout Pennsylvania and the East. They climb around in trees, walking in a herky-jerky manner up and down and around the trunks, along branches, and the undersides of limbs. Both sexes sound a nasal ank ank call. Pairs live in home territories of 20 to 35 acres. White-breasted nuthatches feed on insects and spiders in summer and on nuts and seeds in winter. They relish suet at feeding stations and carry away sunflower seeds for

caching. Sometimes they forage on the ground. Nuthatches wedge acorns and hickory nuts into tree bark and then hammers the shells off with blows from their awl-like beaks. During courtship, the male bows to the female, spreading his tail and drooping his wings while swaying back and forth; he also feeds her morsels. Before building the nest, the birds rub or sweep crushed insects back and forth over the inside and outside of the nest cavity. Ornithologists speculate that this sweeping behavior leaves chemical secretions behind that may repel predators or nest competitors. The female builds a nest inside the cavity (commonly a rotted-out branch stub or an abandoned squirrel or woodpecker hole) using twigs, bark fibers, grasses and hair. She lays five to nine white, brown-spotted eggs and incubates them for 12 to 14 days while her mate brings her food. Both parents feed insects and spiders to the young, which fledge after two or three weeks, usually in June.

Fun facts:

- In winter, White-breasted Nuthatches join foraging flocks led by chickadees or titmice, perhaps partly because it makes food easier to find and partly because more birds can keep an eye out for predators. One study found that when titmice were removed from a flock, nuthatches were more wary and less willing to visit exposed bird feeders.



Ruffed Grouse

The Ruffed Grouse has been Pennsylvania's official state bird since 1931. Where mature forests dominate the landscape, grouse, while present, are limited. But wherever brushy conditions are found, there's a good possibility grouse can be found there, too. Grouse are year-round PA residents and are related to quail, turkeys, pheasants and ptarmigan. The ruffed grouse is found throughout much of the northern part of our continent in areas of suitable habitat. Although its take-off is thunderous and powerful, a grouse cannot fly long distances. Individuals rarely range more than a few hundred yards a

day; in fact, the same bird may be flushed from the same area in the woods several days in a row. A grouse weighs about 1½ pounds, is 15½ to 19 inches long and has a wingspread of 22 to 25 inches. Plumage is rich brown sprinkled with white and black above, and white with horizontal dark brown bars on the breast and undersides. The tail is brown and has a wide, black band between two narrower grayish bands. The name "ruffed" comes from a ruff of iridescent black feathers that almost completely encircles the neck. Males have much more prominent ruffs, which can be fluffed up for a courtship display. Grouse rarely — if ever — die of old age in the wild. Juvenile mortality is great; most grouse die before they are a year old, and few live to be two years of age. Grouse are shy birds and their range has shrunk where cities and towns have expanded; they don't readily adapt to civilization. In the summer, grouse eat many types of food including protein-rich insects, blackberries, blueberries and other wild fruits. In fall, when insects are scarce, their diet is almost exclusively plant foods including small acorns, beechnuts, cherries, barberries, wild grapes, apples, hawthorn and dogwood fruits, and various buds and leaves. Buds form the basis of the grouse's winter diet: aspen, birch, beech, maple, cherry and apple buds are favored. Ferns, green leaves and other evergreen foods are eaten until food becomes more plentiful in the spring. Grouse roost in conifers and hardwoods and shelter under conifers during storms. They may spend winter nights beneath the snow, sometimes flying directly into a soft snowbank at dusk. During winter, a grouse's feet develop snowshoe-like properties through the growth of a horny fringe around the toes. During mating season — March and April — male grouse attract females by drumming. With tail fanned, the male stands on a large,

prominent log or rock and beats the air sharply with his wings. The rush of air created by his wingbeats sounds much like drumming.

Fun Facts:

- In early fall, juvenile ruffed grouse may exhibit a strange period of restlessness known as the “fall shuffle” or “crazy flight.” During this time, some young grouse take off in apparently undirected flight, and a few are killed when they crash into trees, fences, windows and the sides of buildings. The fall shuffle may serve to scatter broods and expand or disperse the population.
- In much of their range, Ruffed Grouse populations go through 8-to-11-year cycles of increasing and decreasing numbers. Their cycles can be attributed to the snowshoe hare cycle. When hare populations are high, predator populations increase too. When the hare numbers go down, the predators must find alternate prey and turn to grouse, decreasing their numbers.
- The male Ruffed Grouse’s signature drumming display doesn’t involve drumming on anything but air. As the bird quickly rotates its wings forward and backward, air rushes in beneath the wings creating a miniature vacuum that generates a deep, thumping sound wave that carries up to a quarter of a mile.



FISHER A carnivorous mammal, the Fisher is swift and graceful as it climbs trees. A Fisher is known as an arboreal mammal because it lives in trees and requires continuous forested areas to survive. Fishers choose cavities or holes in trees to make their home. They choose to live alone for the majority of the year. This allows them to be opportunistic predators. This means they select prey based on its abundance or ease in catching in. The diversity of prey includes rabbits, squirrels, porcupines, and rodents. Fishers are also known to scavenge for food or consume fruits and nuts that may be available. However, fishing is not a favorite food as its name implies. Rarely

would a Fisher take a fish to eat. In fact, its name is thought to have originated with European settlers who felt it looked similar to a European skunk named ‘fichet’. The Fisher is a furbearer for humans. Over harvesting for the Fisher’s fur along with forest destruction caused a significant decline of its population to the point of extirpation. Today Pennsylvania the Game Commission is working to restore its habitat and have successfully reintroduced the Fisher to the state.

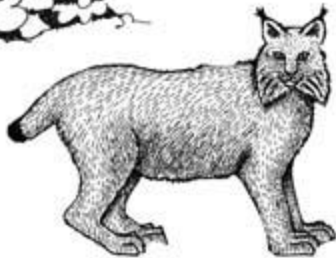


BOBCAT The Bobcat is our state’s only feline predator. A good predator with sharp senses of sight, smell, and hearing, the Bobcat has four large canine teeth and five retractable, hooked claws on each front foot. A short bobbed tail is just one characteristic of a Bobcat. It also has black tipped ears with a ruff of fur that extends out and downward from its ears. A female Bobcat has 1-4 kittens in spring. She guards the litter from predators in dens, caves, and hollow logs. Forests with some open canopy space that allow for diverse prey are favorite habitats in the mountainous part of Pennsylvania. Bobcats

are nocturnal and prey on small animals like mice, and squirrels along with porcupines, mink, muskrat, skunk, fish, and fox. Their back legs are longer than their front legs. The Bobcat is good swimmer, an excellent climber, and can jump a creek or fallen log with strong hind legs.



Animal Tracks



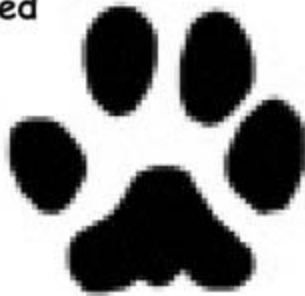
Bobcat

front foot 2x2.1"
back foot 2.1x1.9"



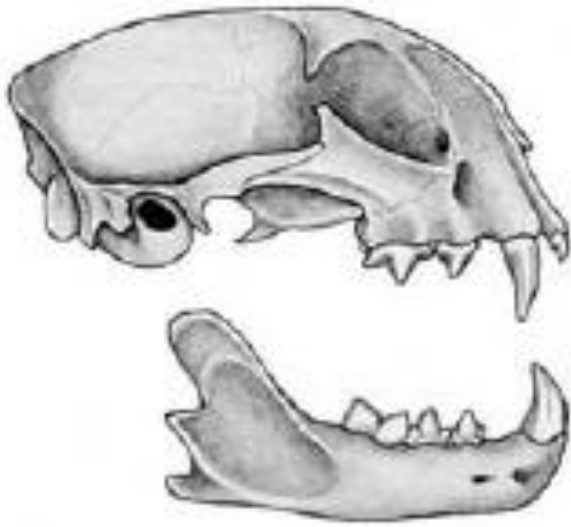
Waling Track Pattern

Actual Sized Tracks



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Bobcat Skull

Carnivore, note the sharp canine teeth and the small number of sharp molars and premolars called carnassials.

Predator, note the eye socket placement towards front, as well as the teeth typical of a carnivore.

Tooth Formula

I C P M

3 – 1 – 2 – 1 per side Total = 28 teeth

3 – 1 – 2 – 1



GRAY FOX A carnivore, the Gray Fox is a part of the same family as dogs, coyotes, and wolves. The Gray Fox's extremely sharp senses of sight, smell and hearing enable it to be a smart nocturnal predator. In Pennsylvania the Red Fox is often found in fields and meadows while the Gray Fox enjoys forests. The hair coat of the Gray Fox is suited for tree like camouflage. Its coat is a gray grizzled or wiry textured hair with tan undercoat. Its tail is long and bushy with a black streak that runs to its black tip of the tail.

The Gray Fox's legs are a bit longer than the Red Fox. The Gray Fox can climb trees. It is the only member of canine or dog family with this ability. The Gray Fox is an 'opportunity' hunter. This means they'll eat whatever is easy to obtain. They will also scavenge for food, especially in winter. It will cache (meaning hide and store) uneaten food by burying it. Scientists estimate that a fox can travel about 5 miles in search of food during the winter. The Gray Fox will den underground. A lifespan of 10-12 years is possible if food, water, and shelter are available.



PINE MARTEN The Pine Marten is a member of the weasel family. Its body is long and lean which is designed to leap through trees in an older or mature forest. It has sharp claws that help it to grip and hang on to branches or climb up a tree trunk. A Pine Marten is a nocturnal predator and using its sharp teeth and keen hearing to hunt prey. While Pine Martens can be found hunting in trees, they also climb about piles of rocks and tree stumps making a den in rock formations. Like some other mammals on the study list, the Pine Marten is an 'opportunity' hunter taking time to eat whatever it can catch including birds, squirrels, sometimes rabbit, along with berries, and bird eggs.

Pine Marten populations are challenged by habitat deforestation. Communities that want to help Pine Martens protect forest areas and make sure wood harvested from a boreal forest isn't taking critical habitat.



SHORT TAILED WEASEL The Short Tailed Weasel is also known as the ermine or Bonaparte's weasel (named for Napoleon Bonaparte who was shorter in stature). Small at only 9-15 inches in length, its short tail sets it apart along with soft fur that is made up of underfur that is short and guard hairs that are longer. The Short Tailed Weasel molts similarly to the Snowshoe Hare. In spring, a dark brown hair coat grows in, while in autumn as daylight becomes shorter, the hair coat drops out and a white coat grows in for winter. It is alert at all times as well as being curious and bold. They make many different vocal sounds that include hisses, purring, chatter, and screeches. When annoyed they might stamped their feet or give off a musk odor. The Short Tailed Weasel can swim to pursue prey in water as well as climb trees. They have a loping gait that causes their back to arch as they move. In forests, they prey on mice, rats, cottontail rabbits, frogs, small snakes, birds, insects, and even earthworms. Though they are predators, they themselves can be preyed on by other predators

such as fox, coyote, bobcats, and owls. The Short Tailed Weasel will den beneath a stone wall, rock pile, fallen tree, or in an abandoned building. Their short legs have five small clawed toes on each foot. Senses of sight, smell, and hearing are very strong which makes their instinct keen. They are active, aggressive to hunt and quick. They are mainly nocturnal hunters however, based on food availability they may be seen hunting during the day too.



ALLEGHENY WOOD RAT

The Allegheny Wood Rat lives in remote rocky habitats of old forests in the state. The Allegheny Wood Rat has little in common with the invasive Norway rate that enjoys living right alongside humans. The Allegheny Wood Rat enjoys wilderness spaces. Caves, rocky cliffs, boulder fields with deep crevices and underground chambers are the favorites of the Allegheny Wood Rat. They eat leaves, berries, nuts, ferns, and fungi. They are nocturnal and feed in a range of about an acre of land. They will hoard food near their nests, meaning they stock pile food. Their nest is built from parts of the forest including bark scraps, twigs, leaves, and moss. Often they will have two living area nests, each about 5 inches across and lined with shredded grasses. The nest is used year round and for the animal's entire life. Since they hoard food, they tend to also collect treasures like old mammal skulls, feathers, bottle caps, coins, rags, pieces of broken china. These objects are hidden in the nest heaped up outside. This is how the Allegheny Wood Rat gets its nickname "pack rat" from its

habit of packing off items to its nest. It's also known as a "trade rat" as it sometimes gets distracted while collecting food. If it comes upon an interesting object while carrying a twig, or berry, it may leave it behind to pick up the new item, like a camper's spoon, or even car keys. They ward off other rats from using their nest sites by thumping their tails on the ground, chattering their teeth, or stumping their hind feet. Due to habitat loss, the Allegheny Wood Rat is a threatened species and has been proposed as a candidate for the federal endangered species list.



COYOTE

The Coyote of Pennsylvania is the largest canine found in the state. Coyotes are found throughout the United States. Those living in the eastern United States are larger than coyotes living in western states. The hair coat of a Coyote is a blend of blond, brown, gray, and black colors. Its ears are always standing up listening and its bottle brush tail is usually in a downward position. It normally has yellow eyes, while now and then some coyotes are born with brown eyes. A Coyote will mate with one coyote for life. A female Coyote will design a den beneath an overturned tree, a rock pile, or an old fox den. She has 5-7 pups each year. Coyotes use a variety of yips, barks,

and howls to communicate with one another. Sometimes they use their voices to gather as a larger pack to hunt. Once Coyotes mainly used forests for shelter, however, today coyotes are found in forests, fields, and even cities. Food habits include deer, rabbits, woodchucks, and smaller mammals. In addition to mammals, Coyotes also eat plant matter such as fruits. A Coyote's favorite habitat is at the edge of a forest with brushy cover where it can hunt for food easily.



Animal Tracks

coyote



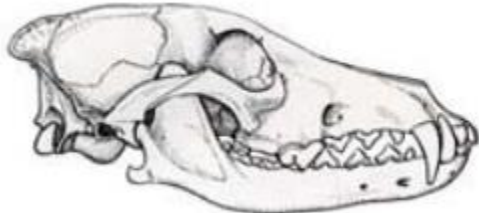
Actual Sized Tracks

front foot 2.75x2.5"
back foot 2.5x2.2"



Side Trot Track Pattern





Coyote Skull

Note: elongated skull, large canines, front -facing orbit, open orbit, long narrow nasals (look at top of skull), low /flat sagital crest to the nose.