



Shrews & Moles

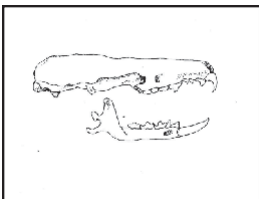
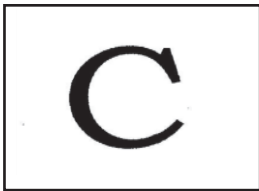
Order Insectivora



Most of us are only familiar with the animals we can see or hear. But lots of things live in the leaf litter and among plant roots. This “under-world” is where **Shrews and Moles spend most of their lives**. Both are plentiful in Pennsylvania and play an important role in local ecosystems.

Shrews and moles belong to the order Insectivora—meaning they feed mainly on insects. The **slender, quick-moving shrews** do most of their hunting by rooting through leaf litter, while their cousins, the **plumper moles**, hunt and live deeper within the soil.

Shrews belong to the Family Soricidae. They are tiny, ferocious predators. They range in size from the pygmy shrew (about three inches long) to the short-tailed shrew (five inches long). None weigh more than an ounce. Males and females of all our seven species in Pennsylvania are the same size.

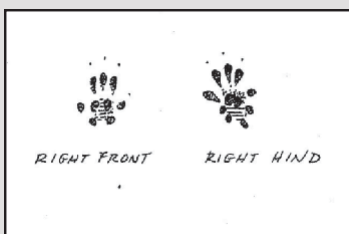


Shrews have very high metabolic rates and, like many small birds, must eat almost continuously. Despite their minute size, shrews are pretty tenacious and often go after prey larger than themselves. The **short-tailed shrew even has venomous saliva**. It is a rare example of toxicity in mammals.

Shrews don't live long. Any sudden temperature change, flash floods, lack of food or fights with other shrews, even sudden fright can all kill them. Shrews are also prey for many other animals. However, **shrews can secrete a foul musky odor that predators find unappealing**. It is not uncommon for a predator like a fox to leave a freshly-killed shrew dead on the ground. They simply walk away after getting a taste of the shrew's foul smell. A dead shrew is one of the few times people may ever get to see a shrew.

So is that a Shrew or a Mouse?

Shrews (middle) have long pointed noses, tiny eyes, tiny ears, slender skulls and a short tail. Mice (right) have bigger eyes, bigger ears and a long tail. Shrews are insectivores with dark-stained pointed teeth. Mice are rodents with chisel-like incisors. Shrews have five toes on each foot (bottom left); mice have four toes on their front feet and five toes on their hind feet.



Masked Shrews (*Sorex cinereus*) cannot see or hear well, but do have a well-developed sense of touch, which comes in handy as they portal underneath Pennsylvania's wooded areas. They especially favor forested swamps, stream sides or springs. Masked shrews spend most of their time underground in hollows they dig or in passageways made by other small mammals. They can climb onto low bushes or fallen trees. They can swim too, but rarely do. Weighing less than a dime, the masked shrew is about four inches in length not including the tail. They molt twice a year, changing from dark browns in winter to lighter shades in summer.

Masked shrews eat a variety of small prey, from worms and snails to spiders and carrion. They will also eat some plant matter like moss and seeds. **Voracious eaters, they may eat three times their body weight daily and are active day and night.**

Nests are crafted from leaves, grass and rootlets placed under logs, stumps, or rocks. Breeding takes place from March to September, during which up to three litters may be borne.

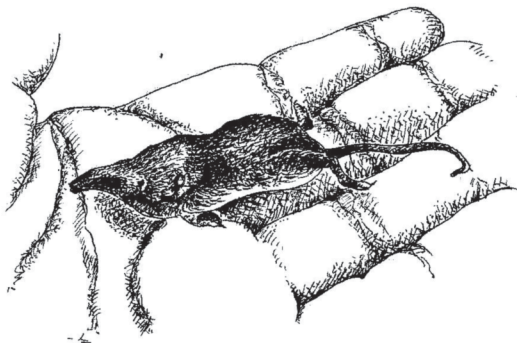
The **Smoky Shrew** (*Sorex fumeus*) occurs in most of Pennsylvania except in the southwestern and southeastern counties where it would be considered less common due to lack of suitable habitat. Similar to the masked shrew, but larger and darker, these shrews love shady, wet woodlands with lots of deep leaf litter. Our hemlock forests, northern hardwoods and stream-sides covered in mossy boulders suit them well.



Like the masked shrew, they are **active all the time**, burrowing and hunting for the same food items. Smoky shrews have even been known to eat small birds. Nesting and breeding behavior is similar to masked shrews, too.

The **uncommon Long-tailed Shrew** (*Sorex dispar*) is also called a rock shrew. They need very rocky habitat in damp, cool deciduous and mixed hardwood forests. They are found throughout most of the state, except in the extreme southeastern and western portions.

Dark gray with slightly paler underparts in summer and an overall slate gray in winter, they can be over five inches in length. **Their tail is slightly thicker and longer than other shrews.** They are very secretive, so little is known of their life history. But they are believed to share many behaviors and characteristics with the masked shrew and smoky shrew, often sharing the same habitat.



Pygmy Shrews (*Sorex hoyi*) are also **uncommon**. It is another species of shrew we know little about. They are the **smallest mammals in Pennsylvania** and one of the smallest in the world, at less than 4 inches long, not including their tail. They weigh about the same as a dime. Pygmy shrews live in mixed habitats of wet and dry natural litter in old stumps or rotting logs, hemlock ravines, even farmland and gardens.

Short-tailed Shrews (*Blarina brevicauda*) are considered **common and abundant** throughout Pennsylvania. They may actually be one of the most abundant small mammals in our state. They are also the largest and darkest of all our shrews - up to seven inches in length, but with a very short tail. Only the least shrew has a smaller tail.

Short-tailed shrews can be found just about anywhere there is topsoil and leaf litter to forage through. They also burrow through the snow in winter. Active day and night, **short-tails might eat small snakes, mice, even small songbirds if they get a hold on one.** Like all shrews, they are considered carnivores but will eat some plant matter like fungi, fruits, seeds and nuts. They also like to cache their food in small chambers in their burrows for a later meal.

The short-tailed shrew has **venomous saliva.** But the toxin can only get into a prey animal through cuts caused by the shrew's sharp teeth. The venom will slow down or kill small, warm-blooded prey.

Their nests are made from woven dry plant materials and mammal hair, located underneath fallen logs, old tree stumps or in rock piles. **They are the earliest breeding shrews in PA,** beginning as early as January. Two to three litters may be raised each year.

The Least Shrew (*Cryptotis parva*) is found scattered throughout Pennsylvania's overgrown dry pastures or meadows, or along woodland edges. Tolerant of other shrews, the least shrew may nest in dried grasses or leaves, underground or beneath fallen forest debris, in groups of a dozen or more, especially in winter.

Cinnamon-brown above and gray below, these shrews also molt from a dark winter pelage to a lighter summer pelage. They are a medium-sized shrew. **Active mostly at night and active all year,** least shrews move through burrows constantly on the hunt for food. Breeding activities are similar to other shrews, though they may breed as late as November.



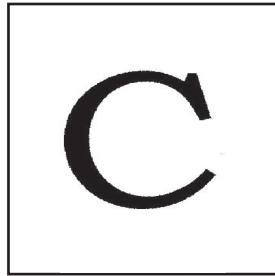
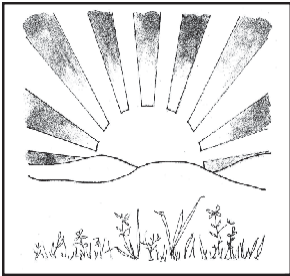
Water Shrews (*Sorex palustris*), found across Pennsylvania in heavily wooded areas, are **uncommon and mostly nocturnal.** Well-adapted to a semi-aquatic life, they live along mountain streams and bogs under bank overhangs, fallen logs or brushpiles. In winter they may move into a beaver lodge or muskrat house. Nests are usually made of dry moss, but little is known about their breeding habits.

Our second largest shrew, water shrews have big hind feet that are fringed with short, stiff hairs and slightly webbed third and fourth toes to help them paddle under water and stay submerged for brief periods of time. Their fur is very dense and traps air bubbles. This keeps them dry and buoyant, allowing them to run short distances across the water's surface. They find their prey—insects, small fish, fish eggs, etc.—by touch.

Moles belong to the Family Talpidae



Moles are secretive, mysterious and rarely seen. Three species of moles live in Pennsylvania. They are all considered **uncommon and fossorial**. Fossorial means they are physically adapted for burrowing. Their unusually large shoulders, short arms and front feet enable them to burrow with ease. Picture an animal shaped like a walrus or seal, but one that spends its life underground.



Moles have big spade-like front feet. Each front foot has broad palms turned outward. This helps them dig really well. Moles have **tiny eyes** that are of little use to them since they are always moving through dark soil, under forests, meadows, even your backyard.

Worried about your lawn? Despite their reputation for ruining suburban yards, moles are extremely beneficial. They help keep air pockets open underground for water seepage and control huge numbers of harmful insects. They are well worth protecting. So consider this...in your yard, moles are feeding on beetle larvae, which do more damage to your grass than a mole tunnel ever will.

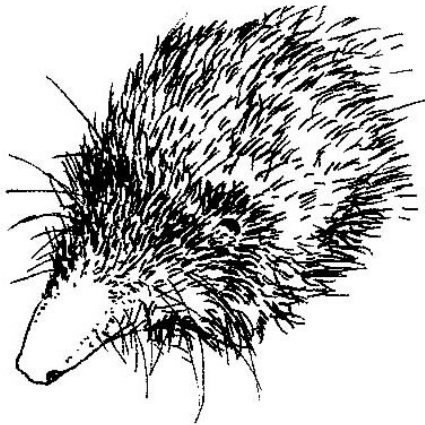


Hairy-tailed Moles (*Parascalops breweri*) are smaller than our other moles and have a short, hairy tail. They thrive in loam soils under both meadows and forests. They don't like wet habitats. Like shrews, they **spend most of their day eating up to three times their body weight.** They'll eat insects, spiders and other closely related creatures but seem to prefer beetle larvae. Only occasionally do they feed on plant roots.

Active underground throughout the year both day and night, they use both surface tunnels and deep tunnels. You have probably seen their surface tunnels in your yard. As they dig through their tunnels they push soil up toward the surface, leaving a trail of lumpy ridges on your lawn.

Moles build a variety of nests for resting, raising young and escaping cold, sometimes nesting almost a foot-and-a-half underground. They breed in March and only produce one litter a year. Four to five young are born hairless, toothless and with skin covering their eyes, probably to keep dirt from damaging them.

Like all animals that live in the dark, they have poor eyesight. However, they have **well-developed senses of smell and touch,** thanks to a moist, pink nose that is constantly moving whenever the mole is hunting for food.



Eastern Moles (*Scalopus aquaticus*), left, look similar to the hairy-tailed mole but have short naked tails. And despite their species name—*aquaticus*—they are not aquatic. Their nose is longer than the Hairy-tailed mole but has a naked tip. Like all moles, the coat has short, dense fur like velvet, with ears that are hidden by the fur.

Their tiny eyes are covered by thin membranes to keep soil from causing damage to them. Eastern moles feed mostly on soil invertebrates like earthworms and insects but will occasionally eat plants.

Like shrews, Eastern moles **have a musty smell that most predators avoid**. But flooding of their underground burrows and humans who cannot tolerate their tunneling take their toll on their populations. Their tunneling behavior and breeding behavior is similar to other moles, with surface tunnels and deeper underground tunnels used for nesting. Their elaborate tunnels even include a separate chamber for use as a “bathroom.”

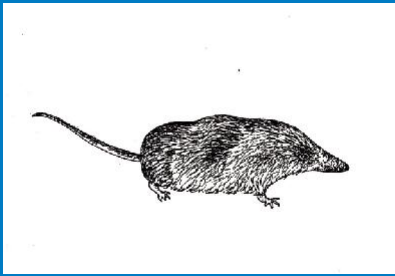
Star-nosed Moles (*Condylura cristata*), (right), are easily identified by the unusual starfish-like appendages around their nose. What do you do with a nose like that? Those unusual whiskers help them feel for prey and star-nosed moles have an excellent sense of touch.

They are semi-aquatic with waterproof fur and a long tail (1/3 of its body length) used as a rudder. The large forefeet act as paddles. The star-nosed mole divides its time between water and water-saturated soils like the kind found in wetlands. Their tunnels often open directly into a water source. In areas where there isn't a lot of wet soil, they can be found in hay fields.

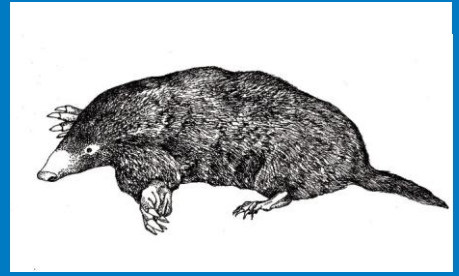
Their diet relates to a semi-aquatic life, feeding on aquatic invertebrates such as caddisfly larvae. In winter they forage under the ice in frozen lakes and ponds for food. The star-nosed mole has the second most teeth (44) of all North American mammals. Only the opossum has more (50).

Because they venture above-ground and into the water more than the other moles, they fall prey to many different kinds of predators, even big fish.





A Simple Review of Shrews & Moles

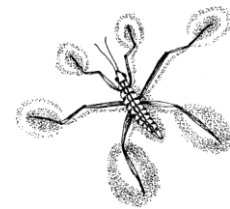


Shrews (above left) and Moles (above right) both belong to the **Order Insectivora**. This means they feed mostly on insects. Even though they are often confused with rodents, shrews and moles have lots of tiny, sharp teeth for biting and killing their prey. Rodents have chisel-shaped front teeth for gnawing on plants.

All shrews and moles share the same features: long pointy noses, tiny beady eyes, short dense fur and five clawed toes on each foot. **Some shrews weigh** about the same as a nickel, some **as little as a dime**. But they are able to capture and kill prey as large as they are. One shrew in Pennsylvania, the short-tailed shrew, can inject venom into a bite wound. It would be almost impossible to be bitten by a shrew, but if you were, it would probably feel like a bee sting.

Because their eyes are so tiny, shrews and moles use their senses of smell, hearing and touch to make their way through leafy habitats. **Some may use a form of echolocation** like a bat. They make ultrasonic clicks and listen to the echoes that return to them to help find their way.

Shrews live under the soil and or in the leaf litter. Their silky dense fur helps them slip through narrow tunnels. The water shrew can even swim, thanks to special hairy toes. The air bubbles that collect in its fur help it run across the surface of the water, like a water strider (at right).



Moles are built sort of like a walrus, with short dense fur and large paddle-like front legs and feet. Their forearms are really big, too. The shape of their body and those large front feet help them to burrow through the soil. Even their fur helps them move underground. It is soft and velvety and can lie in any direction so they can turn easily and not get stuck. **Mole eyes are covered with skin to keep dirt out.** Their ears are tiny, too, and hidden in the fur. Moles can feel vibrations in the soil to alert them to prey or danger. They use their good senses of smell and touch to help them find their way.

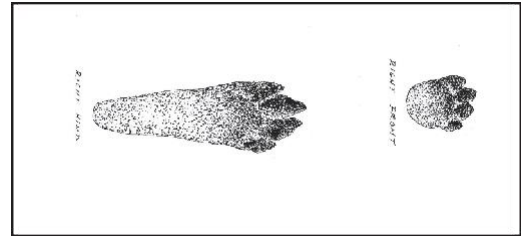
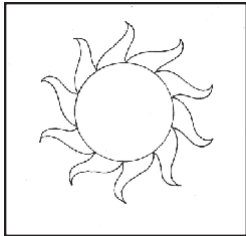
Sometimes you might find mole tunnels in your yard and try to get rid of the moles. But the moles are feeding on beetle larvae which can eat and kill your grass. Moles are much better for your lawn than beetles.

Shrews and moles have high metabolisms. This means they need to eat constantly to keep up their energy level. Sometimes they eat three times their body weight each day. They are among our smallest mammals and are ferocious predators. **They are active throughout the year, not even resting during the winter.** They will hunt for their food, scurrying through leaf litter or burrowing underground, day or night. In addition to insects and other tiny creatures, they love earthworms. Some shrews will even eat small birds.



Rabbits & Hares

Order Lagomorpha



A lot of animals want to feed on **rabbits & hares**. It's an unfortunate place to be in the food chain. But all is not lost, for both rabbits and hares are well-adapted to this constant threat from predators. In fact their populations are genetically stronger, thanks to the evolution of their species in response to the constant assault on their populations.

One of the ways they ensure the survival of their species is to **produce lots of young**. Most will not survive. But if adults can produce enough young, chances are some bunnies *will* survive to adulthood and produce their own young. Constantly replenishing their populations is a successful survival strategy for rabbits and many other small mammals, like mice and squirrels.

Other survival tools are specific **physical adaptations**. Large, movable ears give rabbits a sharp sense of hearing from every direction. Their large eyes enable them to see well. But perhaps more important than the size of the eyes is the location of the eyes on the head. Like most prey species, rabbit eyes are located on the sides of their head. This gives them a wide field of vision which helps them see predators approaching from any direction.

The **ability to run—and hop—in every direction . . . is a survival tool**. Long hind legs paired with short front legs may not seem like a recipe for speed, but they give rabbits short bursts of speed when needed and a zigzag running pattern. This doesn't allow them to run long distances, but it is very effective for evading predators. And believe it or not, rabbits can even swim if they have to.

Rabbits and hares are **well-camouflaged**. Their natural cream, buff and brown fur helps them blend into their surroundings. They are also adept at staying perfectly still, which helps because camouflage only works if they are motionless.



Eastern Cottontail

Sylvilagus floridanus



The **Eastern Cottontail Rabbit** is probably the second most recognized mammal in our state, after the white-tailed deer. Found in both suburban backyards and wild thickets and hedgerows, rabbits are popular with homeowners and sportsmen alike. Upright ears, large eyes and explosive speed give clues to how rabbits survive in a world full of predators.

Please don't call me a rodent! It's true that I have teeth designed for gnawing, but I am not related to mice, rats or other rodents. I have more incisors than a rodent does, and **I have a digestive system similar to a deer.**

Cottontails can be up to 18 inches long and weigh two to three pounds. Female rabbits are slightly heavier than male rabbits.



Cottontail litters are usually born from March through September. Litters range from two to nine bunnies who are born blind and furless after a gestation of about 28 days. The **doe or female** averages four litters per year. She lines her nest with dried grasses and fur that she plucks from her chest and belly. The nest is a cup-shaped depression about five inches across and four to six inches deep.

Once the eyes of the bunny are open they are able to fend for themselves, no matter how helpless they may seem. They might still spend a good bit of time in the nest with their littermates, but if you find small bunnies out and about, leave them alone. They are okay and are much safer on their own. **Do not touch or hold them.** Your body scent will lead a dog or cat right to them, and that could lead to their injury or death.

Rabbits inhabit patches of briars, overgrown fields, hedgerows and suburban neighborhoods. In summer they feed on grasses, clover, leaves, fallen fruit and twig buds. **And let's face it—they also love to feed in your garden and the farmer's fields!** But whatever they feed on, there is usually cover nearby to ensure protection from predators.



In winter, rabbits will switch their diet to items like the canes of wild bramble bushes (raspberries, blackberries and wineberries), tree buds, soft twigs and vines. And rabbits love to eat tree bark off young saplings in the winter. This can lead to **tree girdling**, a circle of bark chewed off the tree. Deer will do the same thing. Girdling can kill a tree, but you can try to protect newly-planted trees in your yard by wrapping the tree bark at about rabbit (or deer) height.



What do Elephants & Rabbits have in common?

A built-in air-conditioner. Mammals with large ears have prominent veins that carry blood throughout their ears. As air blows over the veins in the ear, it helps to cool down the entire animal's circulatory system when that cooled blood flows back into their body.



Snowshoe Hare

Lepus americanus



The **Snowshoe or Varying Hare** gets one name from its **big, furry hind feet** designed for travel over deep snow. The other name refers to its **varying coat**, which changes from white each winter to brown each summer.

Each autumn their tawny pelage begins to be replaced as **brown hairs gradually fall out and are replaced by an almost all white coat, except for black ear tips**. In spring, they molt back to brown. It's good camouflage, but if there isn't any snow in winter, the white coat may cause the hare to be seen easier by a predator. Snow or no snow, the hare will remain white until spring.

Like cottontail rabbits, **snowshoes are herbivores, have excellent hearing and eyesight** and are active during the day. Hares can also stand upright on their hind legs to see or hear even better. **They can run up to 30 miles an hour** and leap up to 10 feet. **And they can swim too.**

How is a snowshoe hare like a deciduous tree?

Like the changing leaves in the fall, snowshoes change colors whether the temperatures are warm or cold. The change in leaf color or coat color is the result of **phototropism**, length in daylight. As days get shorter in fall, the hare's pituitary gland shuts off pigment production in the fur. Any new hair grows in white. The lengthening days in spring cause a reverse in this process.

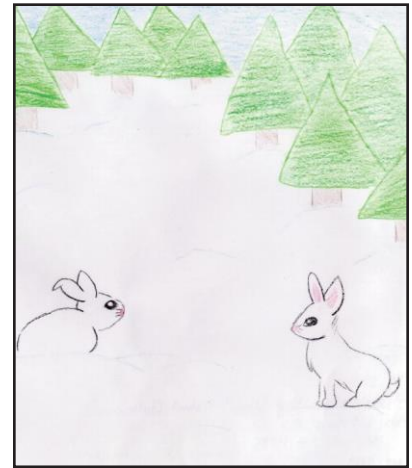


Snowshoe hares are slightly larger than rabbits at about 19 inches in length and up to five pounds in weight. Unlike rabbits, the male snowshoe is heavier than the female.

Hares do not build nests or dens. The doe gives birth wherever she happens to be. Breeding begins in March, when **bucks** fight over **does**, kicking each other with their powerful hind feet. Up to six **leverets** are born after a 36-day gestation period. **Unlike bunnies, leverets are born fully furred and with their eyes open.** They are able to walk and hop soon after they are born.

Snowshoe hares are considered rare and live mostly in our higher elevations in mixed deciduous and pine forests. They especially like rhododendrons and mountain laurel coverts. **Both rabbits and hares feed near cover to protect themselves from predators.**

In summer, both species feed on grasses, leaves, clover, garden vegetables, fallen fruit and the buds and tender twigs of low-growth shrubs. **But snowshoes rely mostly on woody plants for their winter food.** Deep snow enables them to eat twigs and bark further up shrubs and trees by creating a platform for them to stand on with their hind legs. They'll feed on the bark, twigs and needles of many coniferous trees like hemlock, cedars, pines and spruce, in addition to brambles, willows, aspens and alders.



A Simple Review of Rabbits & Hares



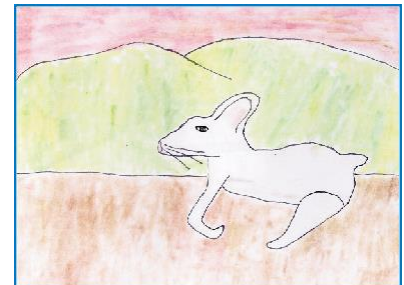
Here's What They Have in Common

Both belong to the **Order Lagomorpha** and the **Family Leporidae**.

Both share the following features:

They have two pairs of upper incisors. The front pair look like rodent teeth. But unlike rodents, rabbits and hares have a **second pair of teeth** behind the front pair. These are much smaller and are **called pegs**.

The **upper jaw of the skull** has a lacey appearance. There are **28 teeth** but no canine teeth, only incisors and molars.



Their two **front legs are short**. Their two **hind legs are long**. The design is perfect for hopping and running fast from a standstill. That's important if they spend much of their life escaping predators. **Each foot has four toes with a claw on each toe.**

The large black eyes help them **see very well**. Large ears that stand upright help them **hear well, too**. A thick coat of **fur also covers the soles of their feet**. Both have a small tufted tail that looks like a cotton ball.

Both are **herbivores** and **diurnal**, meaning active during the day. Their large incisors are made for biting tough plant material. These incisors continue to grow throughout their lives. **Rabbits and hares need to constantly gnaw on plant material** to prevent their front teeth from growing too large.

Here's How They Differ

Rabbits give birth in fur-lined nests. **Hares give birth** on the ground.

Baby rabbits (**bunnies** or kittens) are born naked with their eyes closed.

Newborn hares (**leverets**) are born fully-furred with their eyes open.

Bunnies stay in the nest for a couple of weeks.

Leverets hop less than five minutes after birth and can leave home almost immediately.

Hares (below left) are **bigger** than rabbits; They have longer legs and ears and bigger feet.

Rabbits often dig burrows. **Hares rarely dig** burrows.

When danger is near **rabbits dive for cover** or run and **hide** from a predator.

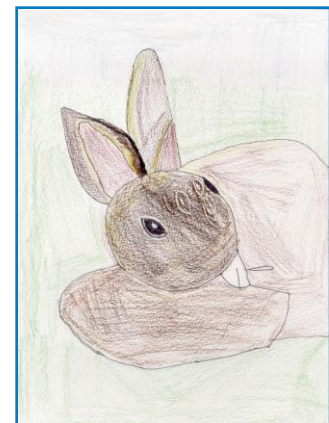
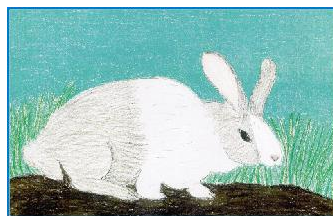
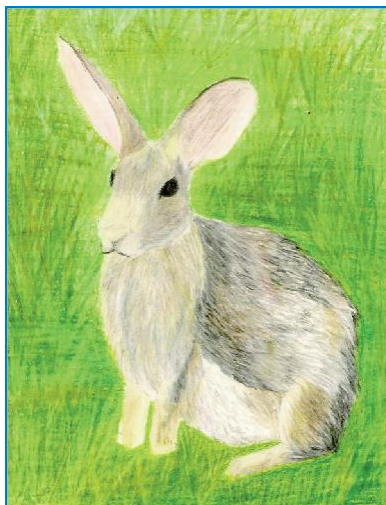
Hares try to **outrun danger** by leaping across open fields.

Rabbits stay a brownish-cream color throughout their lives.

Hares are brown in summer but **turn white** with black ear tips **in winter**.

In winter, hares grow heavy hair on their hind feet, their "**snowshoes**."

Pet rabbits are popular and come in a variety of colors (below center).





Mice, Voles, Lemmings Family Muridae



The Mice and Voles and Lemmings are our smallest members of the rodent family. Like almost all rodents, they breed often and have large litters, providing an ample food supply for our region's many predators. But despite their large populations, these rodents generally stay out of sight. Most are active at night, and most are active year 'round.

Pennsylvania is home to two native species of mice, four voles, the bog lemming, two jumping mice, and two species from Europe. All share the rodent's incisors, two pairs of chisel-shaped teeth perfect for gnawing.

They may be hard to see, but signs of these rodents abound. Winter is a great time to find a mouse cache of seeds and nuts stuffed into an abandoned nest or a dark corner of your attic or basement. This is food that has been collected during the previous season in order to sustain them through winter-time, since only the jumping mice hibernate.

Mice (top right), voles and lemmings are herbivores feeding on any variety of vegetation, but they will feed on insects, spiders and other small creatures. Some might even prey on a bird egg or another tiny mammals, **but most are prey for other animals.** Even large predators like black bears (at right) and coyotes feed heavily on small rodents.

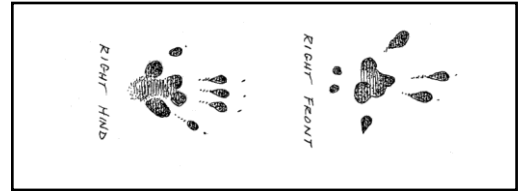
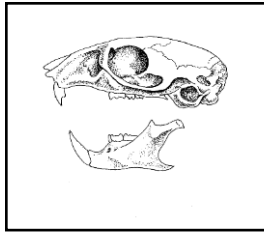
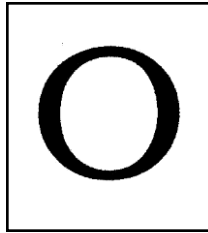
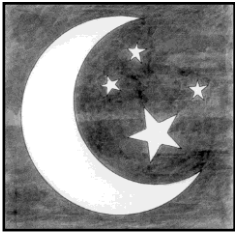
These species can be found just about anywhere from our deep forests to open meadows, marshland, cities and in our homes. Some are at home on the surface of the ground, while others need the protection of thick brush, crevices or tunnels.

Mice and voles generally build round nests made of mounds of leaves and grasses. Some species are very tolerant of one another, especially in winter, and will huddle together within the nest chamber for warmth. The inside of the chamber is softened with downy plant material they have collected. These chambers are also where many litters of hairless, blind pups will be born. The pups grow very fast, and within only a month the mother is able to give birth again. By the age of one month, the young rodents are ready to fend for themselves. This constant cycle of raising young is how this rodent population grows so big so quickly. **WOW! Did you know the meadow vole can give birth to up to 72 offspring in one year?**





The Mice



The **Deer Mouse** (*Peromyscus maniculatus*), below top left, is easily recognized by its large dark eyes, perfect for its nocturnal ramblings, for its beautiful tawny-brown coat that is dark above and creamy white below like a deer. They look like the **White-Footed Mouse** (*Peromyscus leucopus*). Both like to live and search for food among the farmer's cropfields, along fence rows and through grassy roadsides. They tolerate dry or wet habitats and can be found in evergreen or hardwood forests. Deer mice are about seven inches long, including their four-inch tail used for balance when running. The white-footed mouse's tail is smaller. They only weigh between a quarter of an ounce to one ounce.

These mice find most of the food with a sharp sense of smell, but they can see and hear well, too. They can also swim and run quickly for short distances. Their long tail, which is slightly furred, helps them climb when they wrap it around twigs or branches to steady themselves. **Nests** can be in hollow logs, underneath rocks, in nesting boxes, even high in the trees in an old squirrel or bird nest. The nests are used for both rearing young and for resting during the day.

During winters, deer mice burrow beneath the snow. The temperature under the snow is warmer than the air temperature, and the mice have access to previously stored food. The snow offers them protection from many predators, too, although some predators like foxes and owls can hear the mice moving under the snow and will pounce through the snow to grab them.



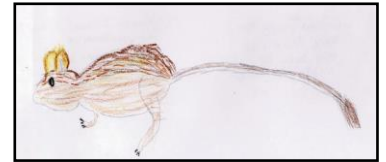
Woodland Jumping Mice (*Napaeozapus insignis*), bottom left, like cool, damp woodlands or forested mountain streams. They like to eat the fungi that grows in those moist habitats, in addition to the normal diet of seeds, berries and occasional insect or worm, **similar in appearance to the deer mouse, but slightly larger**, they are up to nine inches long, including a five-inch, **white-tufted tail**.



Woodland mice use burrows and trails made by moles and shrews, but when they travel above ground they can **hop with their long hind legs and can leap up to 10 feet**. If a predator is still closing in, they will dive undercover.

Both the woodland and meadow jumping mouse hibernate from October to late April. Curled into a tight ball in an underground nest, the mice may hibernate alone or in pairs. In late June or early July, a litter of 3–6 pups is born with a second litter usually in August.

Meadow Jumping Mice (*Zapus hudsonius*), at right, have **big feet, long hind legs and a furred tail longer than its body.** They look as if they are all tail. Almost six inches of their nine-inch body is the tail! Their fur is orange-brown, they have white feet a white belly and a dark stripe running down their back.



Meadow jumping mice like to live in meadows! No surprise there. But despite their name, they rarely jump. They are nocturnal and eat a normal mouse diet.

They nest under loose boards, in grassy tufts or in hollow logs, usually bearing two litters of young each year.

Jumping mice are the only mice that hibernate. In fall, they start to fatten up to prepare for their winter slumber. Their hibernaculum can be found about 18 inches below ground, where the mouse curls around its body. Like a true hibernator, its breathing and heart rate slow down, and its body temperature drops to only a few degrees above freezing. There it will stay, snuggled tight, until it awakes and emerges from its hollow in late April or early May.



The **House Mouse** (*Mus musculus*), left, is found almost everywhere **people live.** Like the Norway and black rats, the house mouse is an Old World species inadvertently brought to North America by European settlers. Ever since, they have permeated every human settlement and have adapted perfectly to living among people. They will eat just about anything associated with us and our trash and are considered a nuisance and expensive pest.



Their eyes are small compared to the large doe-eyes of their wild cousins. Their coats vary in shades of gray, and their bodies can be up to eight inches long, including a three-inch, scaly tail.

Active year-round, they usually live just beyond our own living spaces in wall crevices, attics, basements, barns, outbuildings and more. They are prolific breeders, producing up to 125 young each year among eight litters.

Southern Bog Lemming

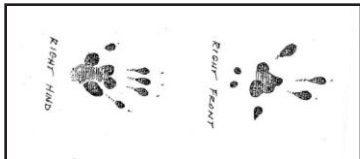
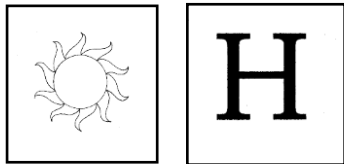
Synaptomys cooperi



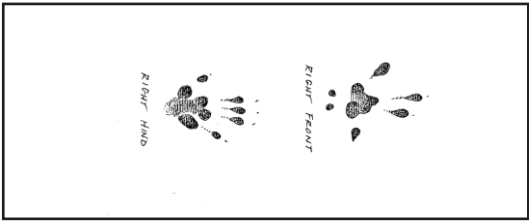
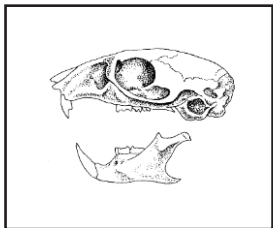
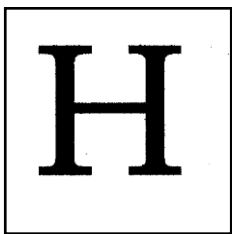
Southern Bog Lemmings customarily cut and feed on low-growing plants. This feeding habit creates runways beneath the matted dead grasses they create, and these runways are where the lemmings live. Lemmings also eat stems and seeds from many kinds of grasses and sedges, berries, fungi and mosses. **They are small and stout with a blunt, rounded head and body.**

Lemmings like grassy habitats and don't really live in bogs. In addition to the grasses they live among and eat, lemmings like mosses, fungi and berries and inhabit old meadows where crabapple trees and locust and hawthorns grow. And while they may be hard to spot since they like to forage underground, **you can identify a bog lemming by its green scat.** That's right. Their poop is green. Lemmings do not digest the green chlorophyll pigment in plants. Instead it passes through their body and turns their droppings bright green.

Lemmings and meadow voles look alike but the lemming is slightly shorter and slightly heavier. Still they only weigh about one and a half ounces. Their fur is a chestnut brown above with silver-gray sides and belly. They have several litters each year and live in the same areas inhabited by meadow voles and white-footed and deer mice.



The Voles



The **Southern Red-backed Vole (*Clethrionomys gapperi*)** is a **typical-looking vole**, a fairly **small, plump rodent rounder than a mouse but with a much shorter tail.** The red-backed is about six inches long with a two-inch tail. Barely heavier than an ounce, these voles have a red band down their back and a pale gray belly. Voles like to move about beneath the leaf litter or through mole and shrew burrows. Red-backed voles can also climb low-growing trees. They are usually found in and among mossy logs, stone walls, overgrown meadows or in forests where it is cool and damp. They are herbivores feeding on seeds, nuts, berries, green plants, plant roots and fungi. Breeding season lasts from spring through the fall, and nests are found in cavities or abandoned nests of other creatures.

Rock Voles (*Microtus chrotorrhinus*) are considered rare in Pennsylvania, found in a small area of the northeastern part of the state. Similar to the common meadow vole, rock voles have an orange nose. Preferring to live in the thick cover of boulders and ferns in hemlock or birch forests, **these voles fall prey to predators like timber rattlesnakes** and copperheads who like to inhabit the same areas. Litters are small with two to three litters each year. Some litters only have one young.



Meadow voles (*Microtus pennsylvanicus*) are our most common vole. They are most at home in meadows and fields as opposed to the woody preferences of the other voles. But they will make a home in a wooded clearing. Attracted to both damp meadows or grassy fields, meadow voles can swim and can scurry quickly. Meadow voles are active throughout the year beneath thick vegetation or snow. In this hidden, secretive world they feed on grasses, seeds, roots and other vegetation, much of which they have cached away. They may also gnaw on the inner bark of trees, a habit that can girdle the tree and kill it.

Nests are found in thick grass or underground in burrows. Voles are found in abundance, often producing up to ten litters a year. Their populations will rise and plummet depending on the availability of food. **In winter they will cluster together for warmth.**



The Relationship Between Meadow Voles & Barn Owls

Small rodents like voles provide food for many, many other animals. Birds like herons, crows and gulls will often prey on them. So will foxes, skunks, weasels, opossums, coyotes, bears and even aggressive, tiny predators like shrews. Snakes take their share too, and because voles will swim, even larger fish like pickerel and bass will eat them. But, by far, the predators with the closest food-web relationship with voles are the hawks and owls. In fact, **the survival of threatened species such as barn owls, short-eared owls and northern harriers, is closely tied to the cyclical presence or absence of the voles.**

Woodland Voles (*Microtus pinetorum*) are our smallest voles. Less than six inches long, their small tail is only one inch in length. Woodland voles are also called pine voles, although their habitat is not restricted to evergreen forests. These glossy reddish-brown/gray-bellied voles also inhabit deciduous forests, overgrown meadows, farm fencerows, edge habitats or orchards.

Living in the soil underneath the leaf litter, they break through the soil using their front feet, incisor teeth and their head. The loose soil is then piled outside their burrow in cone-shaped piles, helping to identify their presence. Woodland voles are rarely seen above ground and maintain a very small territory, as small as one hundred feet in diameter. They cache their food, including flower bulbs, tree bark and potatoes in caches nearly a foot and a half underground. They nest beneath logs, tree stumps or rock piles, bearing four or less litters each year.



A Simple Review of Mice, Voles & Lemmings

Deer mice have fur that looks a lot like deer fur, and that's how they get their name. The similar-looking **white-footed mouse** has a smaller tail. These mice can be found in almost any natural habitat from fields, meadows, and forests, to pasture and croplands, where they can find lots of seeds and nuts to eat. They love to nest in hollow logs or even up in trees in old bird nests. Their very large eyes help them see in the dark. **Since they are nocturnal, they sleep in their nests during the day.** Their nests are used to raise their young and protect them from bad weather. Sometimes these mice will come indoors. But if they do, they like quiet places away from family activity, like your attic.

On the other hand, the **house mouse** loves to live in our houses. They are the most common rodent pest in the world. **They eat just about anything**, including our food and trash. A house mouse will eat meat and dairy products, too. **They will even eat their own droppings.** The bacteria in their guts provides extra nutrients they can use. And they breed a lot! A female house mouse can have as many as a dozen babies every three weeks. That's 150 babies a year!

The best way to keep these mice out of your home is to keep your home clean and put all food away in the refrigerator or in containers with lids. Empty kitchen and household garbage on a regular basis, and seal any small holes and cracks where they can enter your house.

Voles are as common as mice, but most people never notice them. They rarely get into our homes because they can't climb very well, and they spend most of their time living in thick grasses. They might remind you of a chunky mouse because they have rounder bodies, blunt noses, small furry ears and a pretty short tail with no fur.

If you have a garden, you may be more aware of voles than you realize. **Voles are the creatures that love to eat the bulbs of your flowers** or gnaw on the bark of your trees or chew on tree roots, all of which can cause a lot of damage.



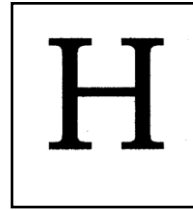
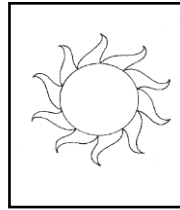
Lemmings look like very fat hamsters. During winter they will live in burrows in the snow. These snow tunnels help keep them safe from predators and frigid weather. The snow acts as insulation. Each underground burrow has a bedroom, bathroom and nesting rooms. Lemming nests are made from grasses with some feathers and fur mixed in.



All small rodents provide food for the predators in our state (like barn owls, left). Animals like weasels, owls and coyotes may have even more young during the year if the rodent population is high that year. During years when the rodent population is low, the predators will have fewer young. So, many rodents actually help control our predator populations.

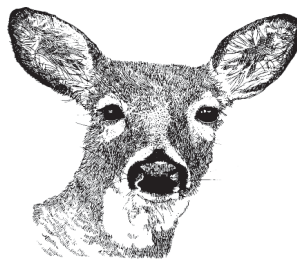


Woodchuck
Family Sciuridae
Marmota monax



Not many rodents have a day named after them, but the woodchuck does. Better known as groundhogs, **every child in the United States knows that February 2nd is Groundhog Day**, especially every child in Pennsylvania.

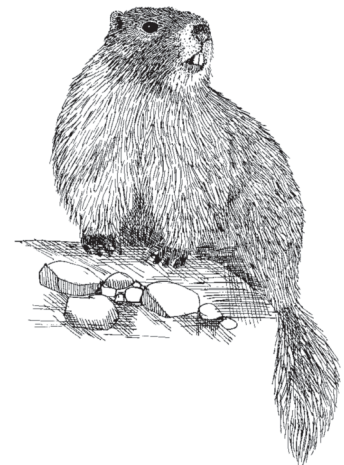
Common throughout the state, their ideal habitat ranges from farm fields, orchards, suburban areas, thick fencerows bordering cultivated crop rows or any habitat closely resembling these. Burrows are dug under dead stumps or at tree bases so the roots can shelter the den entrances. Some burrows can be found in the middle of an open field, but they usually choose a field edge or border for more protection.



Like the red fox and white-tailed deer, **woodchucks have benefitted from our state's habitat alteration** from forests to cleared fields and farmland. Over the past several hundred years, their numbers have continued to climb and today they are all among our most common mammals.

Woodchucks are built for digging. Their short powerful legs, claws and strong bodies are well adapted for creating burrows and living underground. They loosen the soil with their strong forefeet before kicking it out behind them with their hind feet. Burrows are designed to drop at a sharp angle below the entry hole before leveling into narrow tunnels that serve as both escape hatches and hibernaculums. Excavated dirt is piled at the burrow's main entrance and used as a look-out post.

Despite its short legs, **woodchucks can run rather fast** over short distances. **They can also climb trees**, ascending and descending trees head first. Their short, flattened bodies afford them good balance and they can be seen walking easily along wooden fence rails. When they **sit upright**, their front paws help them hold plants while feeding.



Woodchucks are about two feet long including a furred, six-inch tail. They may weigh up to 15 pounds and are at their heaviest in the fall as they fatten up for **winter hibernation**. Their coat varies from yellowish-brown to blackish-brown with darker feet. **As true herbivores**, woodchucks eat just about any kind of plant. They especially love clover, alfalfa, dandelion greens, and any fresh crops in the home garden.

Well-suited for life underground, a woodchuck's eyes, ears and nose are placed on the top of its head. This allows the woodchuck to observe its surroundings from the safety of its burrow. Their senses of sight, hearing and smell are keen and no matter what they are doing, their head will go up every few moments to check for danger.

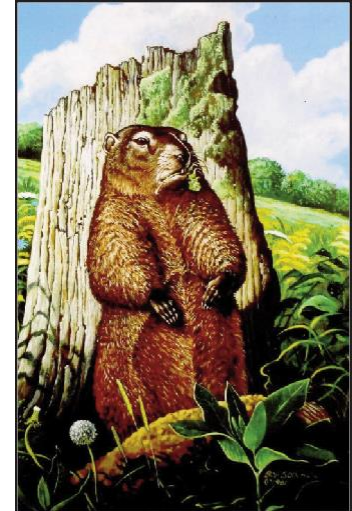
Woodchucks do make sounds. They will whistle for an alarm call, make a "chuck-chuck" sound when eating and chatter their teeth when frightened or cornered.



Woodchucks are true hibernators. They eat heavily throughout summer and early fall to accumulate body fat before they begin denning up after the first frosts in late October. Their body temperature and heartbeat drop drastically as they go into a dormant state, surviving the winter using their own body fat. In mid-winter male woodchucks emerge from their dens to find and breed with females. Newborn chucks are born in April and early May. By summer they are ready to leave their home burrows and establish their own territories.

Woodchucks can cause serious damage on farms. They love corn when it's in the milk stage and can devastate both crops and backyard gardens. But the real danger from groundhogs living in pastures and meadows comes from their burrows. Livestock can easily step into the deep holes and break a leg, causing loss of life or expensive veterinary treatment.

In Pennsylvania, woodchucks are allowed to be hunted during small game season. Despite pressure from hunting, their populations continue to rise and they are stable throughout the state. Although their abundance can be a problem, their ability to create numerous burrows **provides tremendous habitat opportunities for many other species**, such as skunks, foxes.

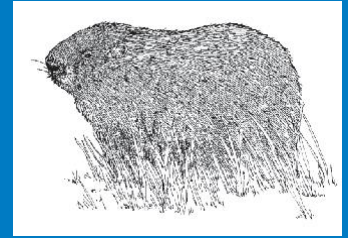


Nowhere is **Groundhog Day** more celebrated than in Pennsylvania, when we wait to see if the furry rodent emerges from his burrow and sees his shadow. If he sees his shadow, it means six more weeks of winter. Other states may also celebrate this day, but it all started in Pennsylvania with "**Punxsutawney Phil**," also known as the original prognosticator.

No doubt, somewhere on February 2nd, the sun will be shining and a groundhog will see his shadow. Since February 2nd is about six weeks from the start of spring, it's easy to see how this celebration got started. **But the real reason those groundhogs are emerging from their den is to search for a mate in the frigid winter air**. Perhaps, like us, they are just impatient for spring weather to arrive.



A Simple Review of Woodchucks



You probably know woodchucks as groundhogs, thanks to Groundhog Day. **Groundhogs cannot really forecast how long winter will last.** They come out of their underground burrows in late winter for another reason. But these big cousins of the squirrel can do some neat things. **They can swim. They can climb trees. They can whistle.** They also help a lot of other animals that live in their same habitat by digging underground burrows that foxes, rabbits, skunks or others may take over.

Groundhogs are short-legged, rotund rodents with brownish-gray coarse fur and a bushy black tail. Each of their front feet has four toes, and each of their hind feet has five toes. They are **herbivores with large front incisors**, perfect for snipping off plants like grass, dandelions and clover. They need very little water since most of their liquid comes from the plants they feed on. Their eyesight and hearing are both superb and although they live close to the ground, **they will stand on their hind legs constantly on the lookout for danger.**

They live in hay fields, pastures and meadows in soil that is loose and dry, ideal for digging. **In late October–early November they will settle into their den for hibernation**, after fattening up throughout the summer and early fall. While in hibernation, their body temperature drops to just above freezing, and their heartbeat almost stops. By February, woodchucks begin to emerge from their dens as the mating season begins.



Groundhog Day first began in Pennsylvania back in 1887. Actually, groundhogs are the only animals to have their own national holiday. Today, February 2nd is celebrated just about everywhere in our country, but nowhere is it more famous than in **Punxsutawney, PA.** No groundhog is better known than Punxsutawney Phil. If the groundhog sees his shadow, it means six more weeks of winter. If he does not see his shadow, it means we will have an early spring. But **the real reason groundhogs are out in February is to look for a mate** in winter instead of waiting until spring.

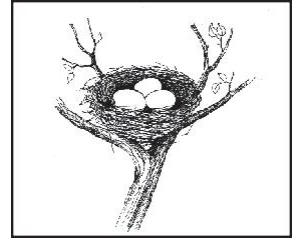
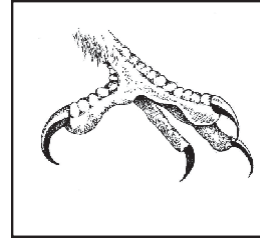
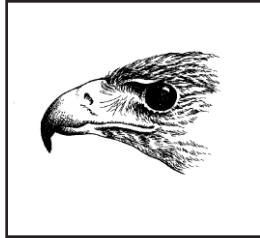
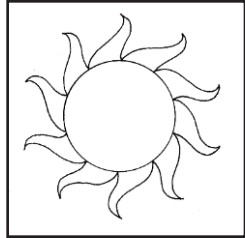
If there is snow on the ground, you can see muddy footprints at a den's entrance as the male groundhog moves from den to den in search of a female. The females usually don't emerge from dens until March. Four to five pups are usually born in April or May. Until they are weaned at about six weeks, the mother brings fresh greens into the burrow to feed the growing pups after they are done nursing.

As much fun as we have with Groundhog Day, real **groundhogs can cause real problems** for farmers. Their burrows create large holes in pastures that cows or horses may step into and hurt themselves. The woodchucks can damage crops, too.



Hawks

Order Falconiformes



Hawks are grouped into four basic types depending on their physical features and food preferences: **accipiters, buteos, falcons and harriers**. In nature, when different species react to competition by evolving to use similar resources in different ways, it is called **Resource Partitioning**. Hawks and owls have adapted to the practice of resource partitioning. Both feed on the same prey in essentially the same habitats, but the hawks are diurnal (active during the day) while the owls are nocturnal (active at night). Their adjusted behaviors help avoid undue competition for the same resources.

Daylight is important to hawks or raptors. Most have large wings compared to their body size. This physical adaptation helps them to soar. **They are designed to ride on thermals**, those circular columns of heat energy that rise above the sun-baked earth. Riding thermals for hours on end without flapping a wing helps the raptors save precious energy while hunting and traveling.

In addition to their **large wingspans**, raptors all possess **sharp talons**, with which they exert extreme pressure to grab and subdue their prey. Some hunt while soaring. Some hunt from a perch and, some, like the peregrine falcon, strike in mid-air. Once their meal is caught, hawks will “mantle” the prey by spreading their wings over it. It is believed this behavior shields the prey from other predators. Their strong, hooked bills are used to tear their food into bite-sized pieces.

All birds possess good eyesight, but birds of prey have **superb eyesight**. It's an important tool if they are soaring high overhead looking down toward the earth for small prey. Their eyes, placed toward the front of their face, give them binocular vision. This enables them to judge distances, an important physical adaptation if you need to quickly grab a fast moving object, like their dinner.

Like all birds of prey, and some herons, **hawks will regurgitate a pellet of indigestible feathers, fur or small bones from their prey**. These pellets help biologists determine which species of animals different birds of prey favor. Studying pellets has also helped protect birds of prey. In the past, thousands of raptors were killed on sight because people believed they killed chickens and other small livestock. The bones found in pellet tell a different story, and we now know that most raptors feed heavily on rodents, playing an important roles in the control of pest species and the natural balance of their ecosystems.



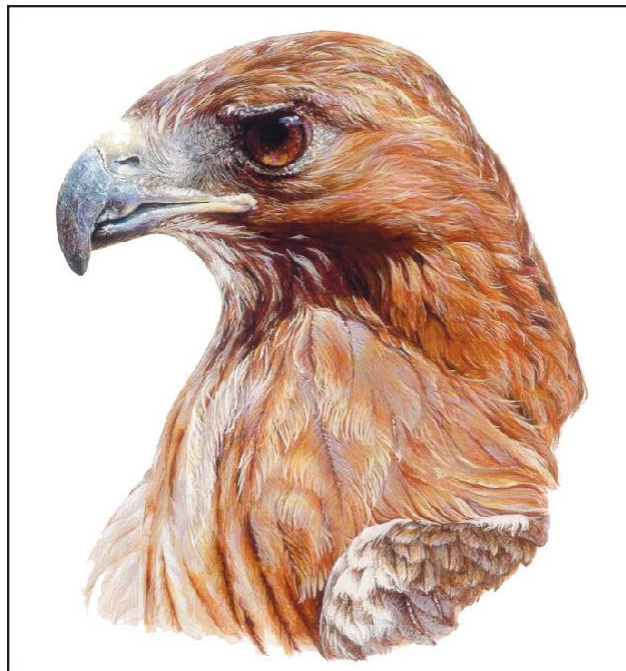
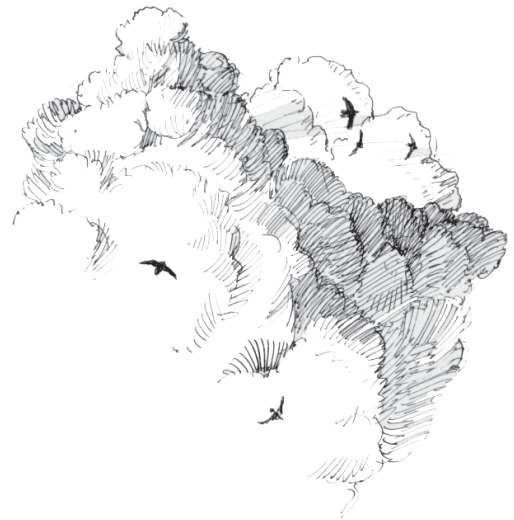
Males and females of most birds of prey are similarly marked and colored, but females are usually larger than males.

Hawks build a stick and twig nest high in the trees, sometimes using the foundation of a squirrel or crow nest. **A few species nest in cavities and some nest on rock ledges.** Most hawks mate for life.

Females begin incubating each egg as soon as it is laid (usually one per day for a clutch of 2–3 eggs). This results in a nest with fledglings of various sizes. If food is scarce, the smaller fledgling may not survive the competition with its nest mates. The **young are altricial** and require their parent's care for up to ten weeks.

Every autumn in Pennsylvania large numbers of hawks migrate through our state, following large physical landmarks like our Allegheny Mountains and the Susquehanna River, to find their way south to their wintering grounds. The autumn migrations are so predictable that world-famous migration sanctuaries like Hawk Mountain in Kempton, PA, can tell you what species to expect on specific days of the month. Spring migrations back north to their breeding grounds are more sporadic.

When we think of birds of prey, **buteos** are probably those birds which first come to mind. They are physically built like we imagine these avian predators should be.





Buteos

Order *Falconiformes*
Family *Buteoninae*



Buteos are larger-bodied hawks with broad, rounded wings and broad, fanned tails. In Pennsylvania, they include red-tailed, red-shouldered, broad-winged and rough-legged hawks. Buteos are commonly sighted soaring overhead in wide circles over open countryside. They will also hunt from perches such as tree snags and telephone poles overlooking fields and grassy patches. They feed mostly on small mammals, reptiles and amphibians.



Red-tailed Hawk

Buteo jamaicensis



Our most common buteo is the impressive Red-Tailed Hawk. A stocky bird up to two feet long with a wingspan almost five feet, the red-tailed hawk is a common sight along our interstates and country roads perched high on a pole or tree looking for prey in the mowed stretches along the highway. When they spot prey, they often swoop down directly in front of an oncoming car. A collision with a speeding car is the number one reason these birds end up in wildlife rehabilitation facilities, if they are lucky. Most, of course, die as a result, but for these raptors it is an easy way to hunt for food.

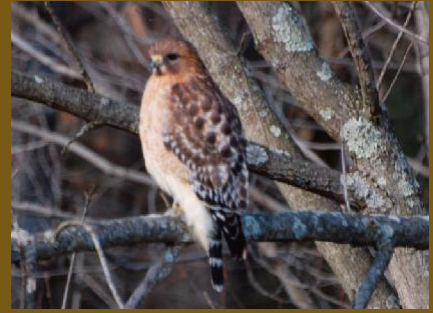
Red-tails do not get their rusty-colored tail until they are several years old. But immature birds can be identified by the “belly band” field mark that all red-tails possess. It is easy to spot when they are soaring on thermals quietly overhead on a sunny day. They **nest high in trees, sometimes lining their nest with evergreen boughs.** Occasionally a nest may be built on a rock ledge. While woodlands are important nesting sites for these birds, they require open country to hunt.

Red-tails are often “mobbed” by crows. If you see a group of crows appearing to attack a tree-top, check closer. They probably have found a red-tailed hawk or a great-horned owl and are determined to pester it until it leaves its perch.



Red-Shouldered Hawk

Buteo lineatus



The **Red-Shouldered Hawk** is smaller than the red-tail, more the size of a large crow. Beautifully colored, the adults have **rusty-red shoulders, black and white barring on the tail and red across the chest.** Not nearly as common as the red-tail, **they prefer flooded woodlands, river bottomlands and swampy areas.** They will often hunt frogs and snakes from a tree snag with an open view.



Broad-Winged Hawks (*Buteo platypterus*)—pictured at left—are also smaller than red-tails. They, too, are crow-sized, but that doesn't mean they are shaped like a crow. Despite their smaller size, both the red-shouldered and broad-winged hawks retain that very buteo-like body shape: chunky, broad-shouldered birds with wide, rounded wings and tail. Broad-wings can be identified by a **wide-banded black and white tail and rusty barring on their breasts.**

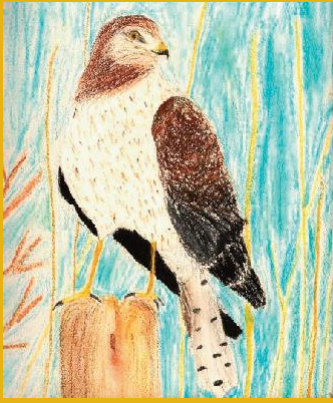
Although common in our state, **they are shier than our other buteos.** They **prefer deciduous woodlands,** so broadwings often go unnoticed, that is, until fall migrations when **huge flocks of broadwings** travel together in groups which are called **“kettles.”** In places like Hawk Mountain, as many as 20,000 broadwings have been known to pass over their look-outs in just one day during peak seasons in September.

Rough-Legged Hawks (*Buteo lagopus*)—pictured at right—are similar in size to red-tails. Unlike other hawks which have yellow-scaled legs, **rough-legs get their name from the feathers that grow down to their toes (like an owl),** giving them a rough-legged appearance.

These birds nest in the Arctic on rock ledges, so the extra feathers are thought to keep them warm. **If their normal prey of lemmings and small birds are scarce in winter, they will migrate south to Pennsylvania in search of food.**

When they do winter in our state, **they soar low over open farmland, which resembles the treeless tundra of their Arctic home.** If there is a headwind, they will **hover** over the fields, **often at dusk,** while searching for prey.





Northern Harrier

Order Falconiformes

Family Buteoninae

Circus cyaneus

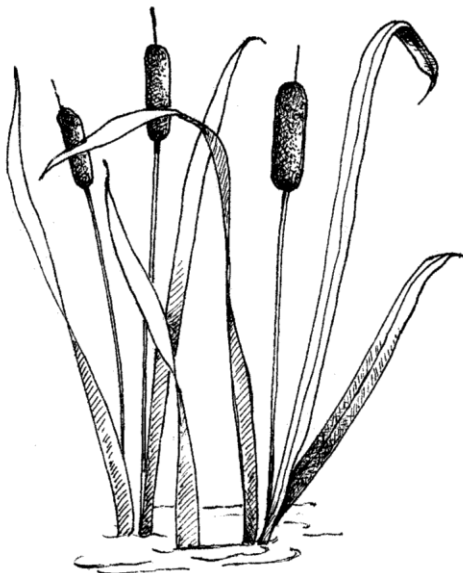


The Northern Harrier is the only harrier in North America. Along with the American kestrel, the harrier is **one of the few birds of prey with males and females differing in color.** This is known as color dimorphism. **Males are slate-gray** above and white below with a white rump patch on the tail. **Females are brown** with the same white rump patch black and tan banded tail. The immature hawks resemble females. Harriers also have **a facial disk of feathers similar to an owl.**

Harriers fly low over open country, similar to a rough-legged hawk. They also share the same white rump patch as a rough-legged hawk. **Their flight silhouette is shaped in a V,** resembling a turkey vulture in flight. Harriers are tall and slender raptors standing about two feet high. They do not have the bulky bodies like that of buteos. Their wingspan is about four feet.

Harriers used to be known as **Marsh Hawks** due to their preference for marshland and wet meadow habitats where they feed on rodents, insects and small birds.

Unlike most other hawks, their stick and grass **nests are built on the ground** or on a low branch over water.





A Simple Review of Buteos & Harriers



When most people think of a hawk, they are picturing a group of hawks called buteos. **Buteos have large wingspans built to soar** over open fields. **They ride thermals**, or warm columns of rising air, helping them save energy while they hunt or travel during spring and fall migration (below). They have **wide-shouldered, chunky-shaped bodies, a large curved beak and strong, sharp talons.**

The most common and largest buteo in Pennsylvania is the red-tailed hawk. They get that red tail when they are about three to four years old. If you can't see a red tail, you can identify these birds by their "belly-band," which is a band of dark spots across their belly.

Like all birds of prey, their **eyesight is superb.** This helps them hunt while high up in the sky searching for small prey way down on the ground. Other buteos include rough-legged hawks, which are about the size of a red-tail but only visit our state in the winter. Broad-winged hawks and red-shouldered hawks are also buteos. They are both smaller than red-tails. **Like all birds of prey, the females are larger and heavier than the males.**

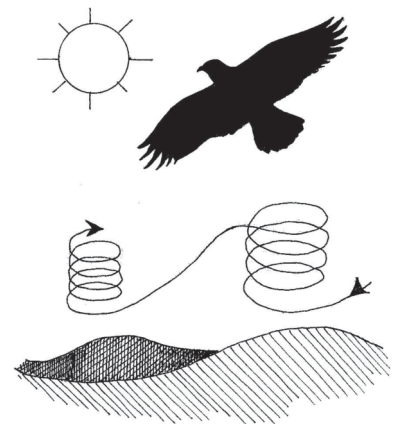
Buteos like to feed on small mammals, reptiles, amphibians and occasionally small birds. During the fall migration these birds gather together in **huge flocks called "kettles,"** following landmarks like mountain ranges and large rivers.

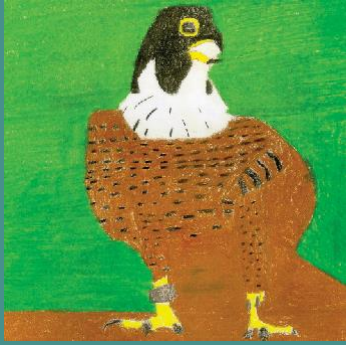
Although **buteos need the open country over which to soar and hunt**, those that nest in Pennsylvania **nest in woodlands.** They build large stick nests, which they often add to year after year. Eggs are laid one day at a time, but incubation starts as soon as the first egg has been laid. This means the **altricial nestlings** hatch on different days. **One nest may have nestlings of various sizes**, the biggest being the first born.

If there is plenty of food, all the nestlings will survive. If food is scarce, the youngest nestling may not make it. These large hawks usually stay in the nest for over a month and remain with the parents, learning to fly and hunt, for even longer.

The **Northern Harrier** is also a large hawk, but **is not considered a buteo.** Their body is more slender. The male harrier is brown and the female is gray. This is unusual for birds of prey. Normally, male and female raptors are the same color. **Harriers fly low over the ground while soaring** and have a large, white rump patch.

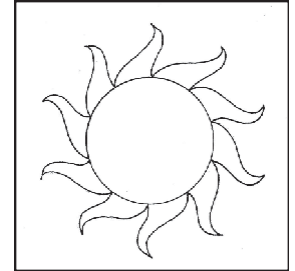
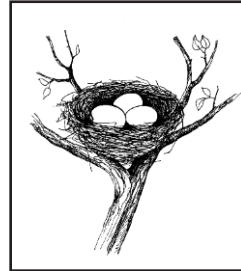
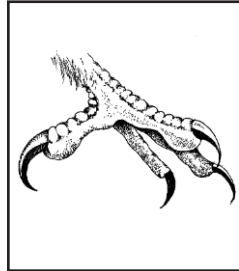
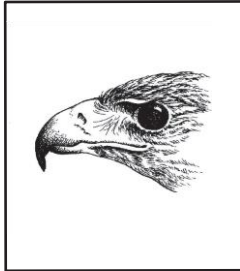
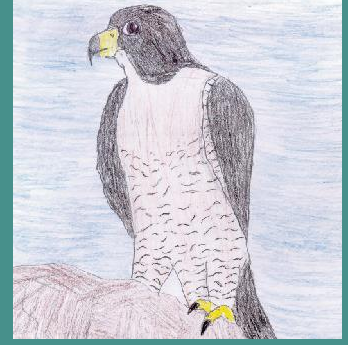
Harriers are a bit like owls. They have round feathers on their faces like the **facial disk** of owls. These feathers are believed to help them **locate their prey by sound**, also unusual for birds of prey. Their wing feathers are built like owl feathers, too. The **structure of the wing feathers help them fly more quietly**, just like an owl. This probably helps them "sneak-up" on their prey.





Falcons

Order Falconiformes
Family Falconidae

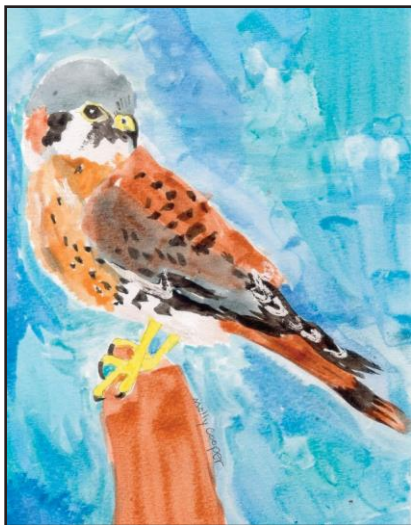


The peregrine, merlin and kestrel are all falcons that are found in Pennsylvania. Falcons are broad-shouldered hawks with large heads, long pointed wings and long tails. This **body shape is perfect for high-speed flights**. They rarely soar, instead flying with fast, stroking wingbeats. Kestrels hunt from a perch, but peregrines and merlins are known for attacking other birds in mid-flight, often diving down on flying prey from above.



American Kestrel

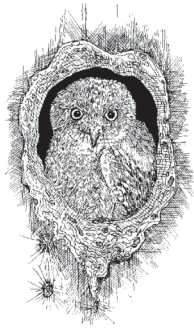
Falco sparverius



The American Kestrel is our most common falcon. Small and colorful, kestrels are often seen perched on fence posts or telephone wires carefully watching the ground for moving prey. **Also known as sparrow hawks**, these falcons are not much bigger than a robin.

Males and females show color dimorphism. Males and females both have reddish caps, backs and tails and black and white face patterns, but the male has slate-gray wings while the female has brown wings.

Kestrels are **very vocal birds** with a high-pitched *killy killy killy* call. Like kingfishers and rough-legged hawks, **kestrels can hover as long as there is a slight head-wind.**



Kestrels usually hunt from a perch rather than catching their prey in mid-air like other falcons. In summer their diet is comprised mostly of insects, while rodents make up most of their winter feeding preferences.

Kestrels are cavity nesters, using old woodpecker holes or natural rotted cavities. Kestrels also respond to man-made nesting boxes if they are placed in the proper location and at the proper height.



Peregrine Falcon

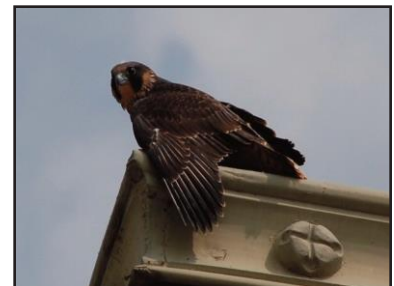
Falco peregrinus



Peregrine Falcons are an endangered species in Pennsylvania. Mature birds are easily recognized by their black heads and black “tearstains” below the eye. Their upper bodies are slate-gray with white and dark barred undersides. Immature peregrines are brown-streaked.

They stand about 20 inches including their tail. Wingspans are almost four feet. **Peregrine falcons are the fastest of all birds.** They are powerful hunters that rely on the element of surprise when they attack. Folding their wings against their bodies, **peregrines are able to dive at speeds of up to 200 mph.** They strike their victim with such force that the strike alone often kills their prey. Once the victim falls to the ground, the peregrine grabs it with its talons and carries it off to eat.

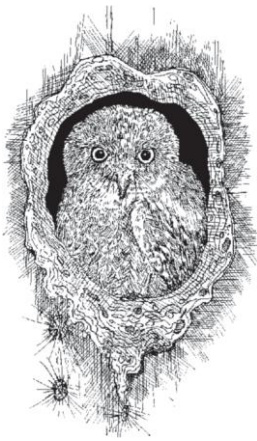
In the past, toxic pesticides nearly wiped out these birds until many of the pesticides were outlawed, and the birds were placed on the federal Endangered Species List. For the past several decades, their numbers have slowly increased. **Ledge nesters**, peregrine falcons now nest on skyscrapers and bridges in Harrisburg, Philadelphia and Pittsburgh. In these congested cities, pigeons are a favorite meal.



Merlin

Falco columbarius





Merlins are about the size of a blue jay but look very similar to peregrine falcons. They are also known as pigeon hawks, not because they eat pigeons but because they fly and perch like pigeons.

They prey on small birds, insects and small mammals, including bats.

Merlins nest in cavities, on ledges or in abandoned crow nests. **They do not nest in our state**, but they can be seen during spring and fall migrations.



A Simple Review of Falcons



Falcons are a group of raptors (birds of prey) built for swift flight and fast diving attacks on their prey, mostly other birds. They often have two black facial stripes or “tear” marks under their eyes. Their flight is often a series of rapid wing beats alternating with glides.

Our smallest falcon is the American Kestrel. They are also among our most colorful birds and along with harriers, kestrels are the only birds of prey with the male and female showing different colors. Even though they are falcons, kestrels feed mostly on insects in the warm months and small rodents in the winter. Kestrels prefer to hunt from a perch waiting for their prey to pass by, rather than attacking their prey from the air.

Kestrels can hover, but like osprey and kingfishers, **there must be a slight head wind** in order for them to do so. They are also very vocal birds, calling out a loud, excited, “*killy, killy, killy,*” in flight or from a perch.

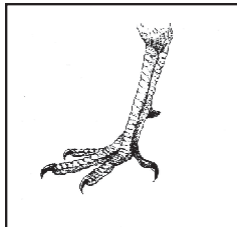
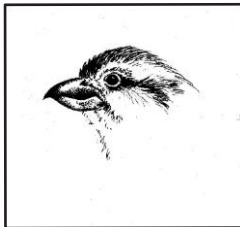
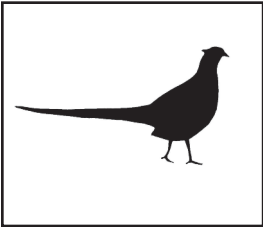
Kestrels are cavity nesters. If you ever find a large tree cavity near an open meadow with bird droppings dried to the wall, it is probably a kestrel cavity. The nestlings squirt their dropping against the inside wall of the cavity where it dries and stays off the other nestlings.

The Peregrine Falcon is the fastest bird known to man. They have been clocked in dives of over 175 mph while pursuing their prey, mostly birds. When they dive for their food, they can pluck the bird right out of the air. Like the bald eagle, peregrine falcons **were on the endangered species list** for many years because of pesticide poisoning. Recently their populations have been slowly increasing. **Peregrines** love to feed on pigeons and **have taken to living in large cities** to take advantage of the large pigeon populations found there. When these birds live in cities, they **nest on the tops of large buildings**. In wilder parts of their range, they often nest on cliffs.



Gallinaceous Birds

Order Galliformes
Family Phasianidae



Gallinaceous birds refer to a group of ground-living birds, like pheasants, turkeys, grouse and quail, that are chicken-like and share certain physical characteristics. They have **strong legs and very thick, powerful toes with well developed nails, which are perfect for scratching the ground** in search of seeds and grains. They also eat fruits, berries, shoots, leaves, grasses and insects. They have **strong seed-cracking bills**.

Males in this group often have elaborate plumage they can raise or spread during breeding season to entice a harem of females. Most males, also known as cockbirds or roosters, do not help with raising the **precocial chicks**. Females are called hens.

These birds usually only **fly in short, explosive bursts for short distances** (sometimes accompanied by a raucous call) before settling down again.



Wild Turkey
Meleagris gallopavo

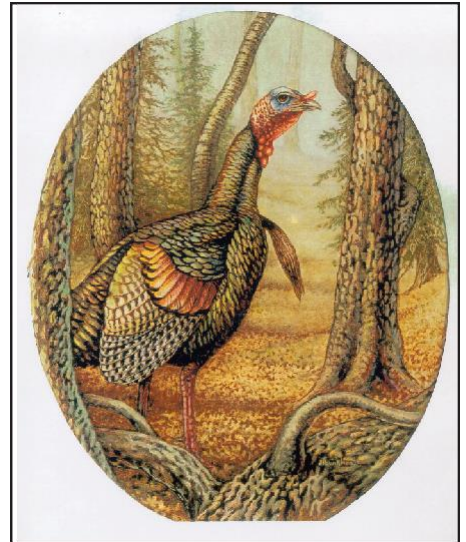


Famous for its role in that all-American of holidays, Thanksgiving, the turkey is **our largest game-bird**. Adult **males, “gobblers” or “toms,”** stand up to 3 feet tall and 3 to 4 feet long. The hens are almost a third shorter and weigh half as much. Like all ground birds that rely little on flight, **turkeys are heavy birds**; an adult tom may be up to 25 pounds. Compare that to a large great-horned owl that may weigh only three pounds!

Wild turkeys have **long slender necks and bodies with a fleshy, multi-colored head and neck**. Their overall plumage is metallic bronze, browns and blacks to help them camouflage in the wild, and their **tail feathers are edged in brown** instead of the white tips found on domesticated turkeys. Tom turkeys have breast feathers tipped in black, while the hens end with a pale brown.

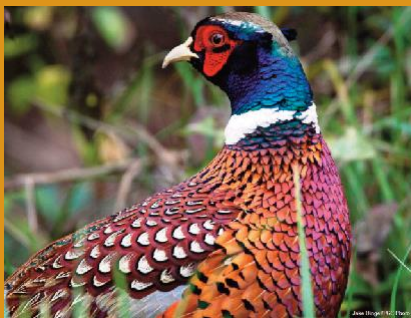
The smooth bumps on a turkey's featherless head and neck are called "**caruncles**," and the **fleshy flap of skin** dangling above their beak during breeding, fighting or during extreme heat is called the "**snood**." The fold of skin under a turkey's chin is called the "**dewlap**," similar to the "wattles" found on a chicken.

The adult turkey's lower leg is red-colored and the toms have **spurs**, which are sharp, bony spikes, used in fighting, on the lower backs of their legs. Toms also sport rough, black "**beards**," growing from the upper breast. These hair-like feathers are called **mesofiloplumes**. They can reach up to a foot in length and are believed to help other turkeys know at a glance which is an adult or juvenile. It's not a reliable determination of age because the hairs can break off.



Toms let loose with a **robust gobble, gobble, gobble** during the breeding season, especially in early morning or late evening. Both the tom and hen have an array of vocalizations for communication. Hens lay about a dozen eggs in a solitary leaf-lined ground nest. It takes almost a month for the clutch to hatch. The young **precocial birds** are called **poults** and follow the hen as soon as they dry, surviving by scattering or "freezing" in place at the hen's alarm call. Until their wings are fully developed and they can **roost in trees**, the **hen will brood the poults under her wings overnight**.

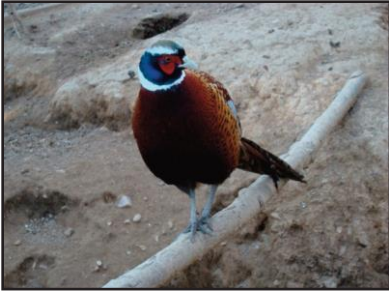
Poults thrive on a high-protein diet of **insects, soft greens and fruits**. By fall, the poults will add **mast** (beechnuts, acorns) to their diet. When they eat large, hard nuts like acorns they extend their long necks and swallow the nuts whole. The nut remains stored in the bird's **crop**, where digestive juices and body heat soften the food. From the crop the nut is passed into the **gizzard**. **Gallinaceous birds often pick up and swallow small stones and gravel** called grit that make their way into the gizzard and **act like teeth to further digest hard seeds**, eventually grinding down food such as an acorn.



Ring-necked Pheasant
Phasianus colchicus



The ring-necked pheasant rooster sports **mixed hues of golds, reds, browns** and black on its body along with distinct **red cheek marks**, iridescent dark green head, gold breast and greenish-blue lower back. The hens are a subdued blend of browns designed to hide them in tall grasses. Adult cockbirds stand about a foot high, though their entire body length from beak to tail tip is almost three feet in length. The **bright white ring of feathers around their neck** gives them their name. The tail is long and pointed with black horizontal bars. The short, round wings allow for **rapid, pumping, low-flights** across meadows or woodland edges when startled.



The rooster's call includes a **loud double crow followed by quick, muffled wing-drumming**. Usually heard at sunrise and sunset during breeding season, cock-birds also cackle when flushed from a roost. The hens, like most female birds, remain quiet except for soft clucks to her young.



During courtship the **rooster struts, spreading tail and wings and ruffling his neck feathers** to attract a harem of hens. Nests are scratched into the ground in a hayfield, overgrown pastures or fencerows. The well-concealed nest is lined with a bit of vegetation to hold up to 15 pale green eggs that hatch about two weeks later (early July). The **precocial chicks** are sheltered by the hen in poor weather (she sits on top of them) until they can roost in the trees at night. If danger is near, the young **freeze-in-place like a deer's fawn**, tucked low to the ground to allow their camouflage to work.



Ruffed Grouse

Bonasa umbellus

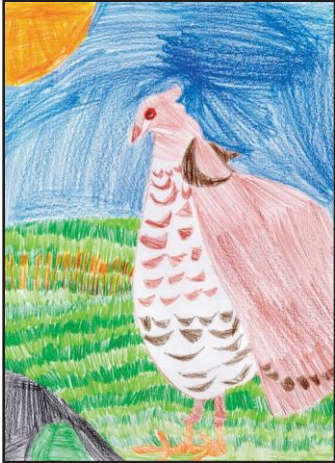


First of all, they're **our state bird**. You should know that. Secondly, it is called the **ruffed grouse, not "ruffled."** They are found throughout Pennsylvania, but are not common. Grouse love **brushy cover**. Their **drumming wingbeats and fanning tail feathers** signal their annual courtship ritual.

Like all ground birds, the grouse's plumage is designed to help them blend into the landscape. The body is mostly a deep brown mixed with white and black on its back and white with dark barring on its breast and undersides. Their brown tail has black and gray banding across it. They rarely may be found in a "silver-tailed" or "red-ruff" color phase. **A ruff of black feathers around the neck gives the birds their name, ruffed grouse.**

Grouse are about the size of a chicken but not quite as tall, with a wingspan of up to two feet. They weigh less than two pounds, and males are larger than females with more prominent neck ruff, which they use during courtship. The hen's tail is shorter with a break in the center of the black tail band.

In addition to seeds, nuts and berries, **grouse love tree buds**, especially aspen, birch, and apple. They'll also eat green leaves, ferns and conifer seeds. Grouse like to **take dust baths**, which are believed to stimulate feather growth or perhaps rid them of parasites. In winter, grouse sometimes **dive into a snowbank to keep warm or avoid danger**. They will also roost under evergreen boughs during snowstorms. **In winter their feet grow fringes around the toes.** This increases the surface area of each toe, sort of like growing snowshoes, enabling them to more easily maneuver on the surface of the snow.



Grouse are not strong fliers, but after a **rapid take-off they fly quickly for a short distance, lock their wings and glide down for a landing.** The total flight may be 100 yards or less, unless forced by some disturbance to repeat the flight to a new location.

The ruffed grouse is best known for the **males's breeding behavior** in March and April when **he finds a suitable log or rock on which to perform.** In his efforts to attract the female he will rapidly **slap the air with his wings, creating a low drumming sound.** He also struts with his tail and ruff fanned out, while hissing.

The **sheltered nest is a depression on the ground** at the base of a tree or in brush. Up to 16 white or buff eggs are deposited on leaves. Grouse are precocial and are raised similarly to pheasants, bobwhite and turkey.



Northern Bobwhite Family Odontophoridae *Colinus virginianus*



They whistle their name with a sharp, "**bob-white, bob...bob-white.**" The short, rotund bobwhite quail is the **definitive game bird of south-central Pennsylvania's** woodlands and hedgerows bordering large expanses of overgrown meadows. Year-round residents, we are their northernmost range and local bobwhite populations are greatly affected by our habitats and climate. Their **diet includes just about any plant seed** as well as **insects**, including pest beetles, mosquitoes, aphids and grasshoppers. They love farm grains such as corn and sorghum and will eat green shoots, nuts, berries, acorns and hickory nuts.



Bobwhites have short wings and a short, round tail. Adults stand about 6 inches high. Their rich chestnut-brown plumage is marked with white and black, orange-tinged sides and white or cream bellies lightly barred with black. Their **white throat and eye-stripe are separated by a dark band.**

Bobwhites **live most of the year in coveys**, a social group of up to 30 birds. Coveys offer protection while the birds work together to find food or rest. When **roosting at night, bobwhites form a circle on the ground with their tails together and heads pointing outward.** This behavior helps them maintain body heat and keep an eye on threats from every direction. If frightened, the entire covey will flush in all directions.

Unlike other game birds, **bobwhites mate with only one female instead of a harem of hens.** They will nest in high grass, weeds along a fencerow, roadside or stream bank or in timothy, alfalfa or clover fields. Locations near old farmsteads are perfect (below right). A simple **nest is scratched into the soil and lined with dead grasses.** Two broods may be raised between May and August.

Up to 20 creamy white eggs are laid and then incubated by both parents. **If threatened, the adult may feign an injury like a broken wing, dragging itself away from the nest in an attempt to lure away a predator.** Once they are a safe distance from the eggs, the bobwhite will simply fly off, satisfied that its charade has worked to keep the nest safe.

After a little more than three weeks, the precocial chicks hatch and are able to run about and feed themselves as soon as their feathers are dry. Fuzzy and well camouflaged, **the parents still protect them at night and in poor weather by sitting on top of them.**



A Simple Review of Gallinaceous Birds



The term “**gallinaceous**” birds may not be familiar to you, but you have probably heard of “**game**” **birds**. Both names refer to the same group of birds. Turkeys, pheasants, grouse and bobwhite (or quails) are all gallinaceous birds.

These are ground-walking birds, usually with lovely mottled brownish, black and white plumage to help them camouflage with their surroundings. Males (roosters or cockbirds) in this order often have special feathers or appendages they can display during breeding season to attract a harem, or group of females.

The chicks are precocial and raised only by the hens.

Though they are considered **ground birds**, they can and do **fly and even roost in trees**. But their flight is usually only for a short, fast flight, calling loudly as they burst up off the ground.

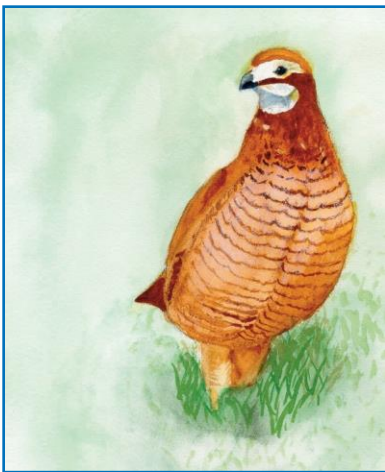
The best-known of the gallinaceous birds is the **wild turkey**. **Benjamin Franklin** was so taken with these birds he **wanted them to be our national symbol** instead of the bald eagle.

The **male turkey or tom** has a beautiful tail feather that it spreads proudly while strutting for the attention of a hen. The tom has a small, blue featherless head that can change color according to his mood. He also has a **beard of feathers** that dangle from his breast, **red throat wattles and spurs on his legs**. He is our largest game bird.



Although the turkey never did become our national bird, another of our game birds, the **ruffed grouse**, did become **our state bird**. Grouse are chicken-sized birds that live within the dense undergrowth of deciduous and coniferous forests. **Males stand upon fallen logs “drumming” their wings**. The calls echo through the woods during breeding season, thanks to the hollow log.

Grouse are well-suited to our snowy winters. They can **dive into snowdrifts** to keep warm or roost under a snow-covered pine branch low to the ground. They also **grow extra feathers around their toes in winter**. These act as snowshoes, allowing them to walk on top of the snow and reach the tree buds, greens and seeds they love to eat.



The **Northern bobwhite or quail** is a bit smaller than a grouse and more plump. Their beautiful plumage camouflages them well in the overgrown **fields and farmlands** they love to inhabit. Their song is their name, **“bobwhite, bobwhite,”** repeated over and over in a clear, whistling tone. Bobwhites are social birds that like to **live in groups called coveys**.

These coveys offer the birds protection when searching for seeds or insects. **When roosting at night, they form circles** on the ground with their heads pointing outward. In addition to helping the groups stay safer, their close contact helps keep them all warm.

Of all of our game birds, only the **ring-necked pheasant is an introduced species**. These larger chicken-like gallinaceous birds were brought over from Asia about 150 years ago for the purpose of hunting. They are also one of our most colorful birds with coppery body feathers, an iridescent green head, white neck ring, and bright red eye patch and wattles. Their **long, slender tail is pointed**.

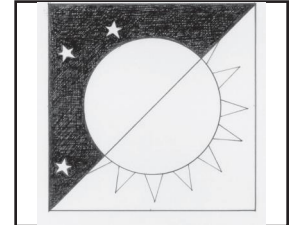
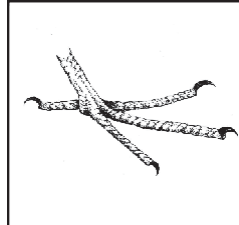
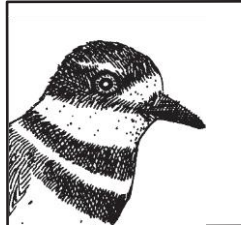
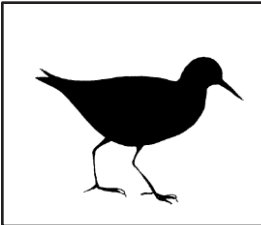
One **rooster keeps a harem of hens**. In contrast to his striking plumage, the hens and **precocial chicks** are muted tans and browns, perfect for a life hidden among the overgrown grasses on the **meadows and farm fields** they love.





Plovers

Order Charadriiformes
Family Charadriidae



Plovers are wading birds that are built more compactly than other sandpipers with **shorter, thicker necks**. Their eyes are noticeably larger and their bills are shorter. When plovers move they **run in short bursts, then stop and freeze in place, and then run again**. You rarely see a plover walking calmly like other waders. They eat some plant matter, but mostly insects and crustaceans, especially marine crustaceans if they are a species that lives near a coast.



Killdeer

Charadrius vociferus



Normally we associate plovers with the beach. But **our most common plover, the killdeer, is most often seen on mowed, open parks, golf courses or even parking lots**. Killdeer are a lovely fawn-color on top with a creamy underside, with **two black rings circling their neck and a red eye ring**. Their call is a high-pitched, urgent *kill-deer, kill-deer, kill-deer*, which can be heard during the day, while they are on the ground or flying, or even at night. They are slender, lanky birds with long, pointed wings and tail. When they burst into flight, an **orange rump-patch** can clearly be seen.

The killdeer doesn't really build a **nest**. It is more like a **shallow depression scratched into bare ground**. About four well-camouflaged speckled eggs are laid directly on the ground. Sometimes the killdeer will place rocks, shells or sticks near the eggs, but the only real protection the eggs have are the adult killdeer. When the nest is threatened killdeer will go through an elaborate display to draw the intruder's attention away from their nest. It's called "**feigning**" and involves one of the adults making a verbal racket while **dragging a "broken wing" along the ground**. Once the intruder moves toward the "injured" adult, the birds quickly and safely take flight. The chicks are precocial and can follow the adults to a slightly more protected area, often a marsh or stream, as soon as their feathers dry.

Plovers are another kind of shorebird. **Our best-known plover is the killdeer.** They really don't need to live near water. Instead they seek out large, mowed fields, golf courses, even parking lots and flat-topped buildings.

Killdeer are sharply marked with **two black rings** around a creamy white throat and belly and **bright red eyes.** Their eggs are perfectly camouflaged to sit unnoticed on their **ground nests** (or sometimes on a flat roof top).

If the killdeer senses danger approaching, they put on a dramatic act to lure the predator away from their nest. Killdeer **"feign" an injury** like a broken wing and call *"killdeer, killdeer, killdeer"* in excited, high-pitched tones **to attract the attention of the predator.** It usually works since most predators would rather go after injured prey. Once the predator follows the "injured" killdeer away from its nest, the bird simply flies away, calling the whole time.

If you ever see this behavior, it probably means you have walked too close to a killdeer's nest.

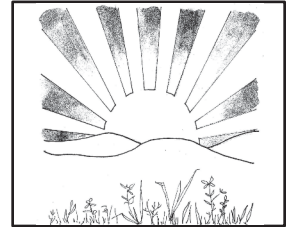
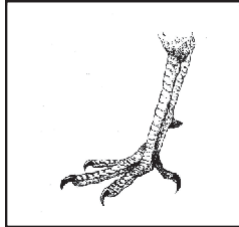
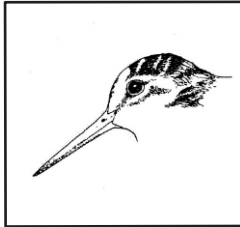
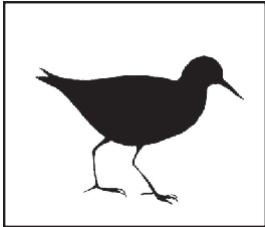
A Simple Review of Plovers





Snipe & Woodcock

Order Charadriiformes
Family Scolopacidae



American Woodcock

Scolopax minor



Snipe

Gallinago gallinago

Woodcocks (top right) and **snipes** (top left) belong to the same order as plovers, sandpipers and seagulls. Their plumage is a deep rust and brown with tan breast, back and sides that are mottled with black and browns. **A distinct field mark for the woodcock is a barred head crown** going across their head, **while the snipe has stripes atop its head** going in the same direction as the bill. Their tails are short and their wings rounded. They only stand about five inches high and could be described as chunky, though the snipe is slightly more slender. **Females of both species are slightly larger than males.**

Their long, slender bills are designed to find earthworms. About 2–2½ inches in length, the lower end of **the bill is filled with nerve endings that help the birds “feel” the worms** moving through the soil. Special bones in the bill allow them to flex open the tips of their bill underground, while a long, **rough tongue enables them to pull the slimy earthworm up out of the soil.**

Their eyes are placed on the side of their head, away from their bill. This enables them to keep alert for danger while their bill is down in the soil. Eyesight and hearing are excellent. Their ears are unusual; the openings are placed between the eyes and the bill.

Woodcocks are verbal birds, establishing “singing ground” territories in spring. These sites are clearcuts in wooded lots with lots of low brush. From early March through mid-May, males call a nasal “*peent*” from the ground and use their high spiraling maneuvers and warbling calls to attract a mate.

Also known as timberdoodles, they put on an amazing aerial display at dusk, flying upward about 300 feet and then spiraling back down toward the earth while releasing a loud warbling call.

Snipes also climb high into the sky and then dive down with their spread wings and tail creating a *hu hu hu* sound as they descend. When disturbed, snipes give a rasping call as they erratically flee. They then level off at speeds of up to 60 mph.

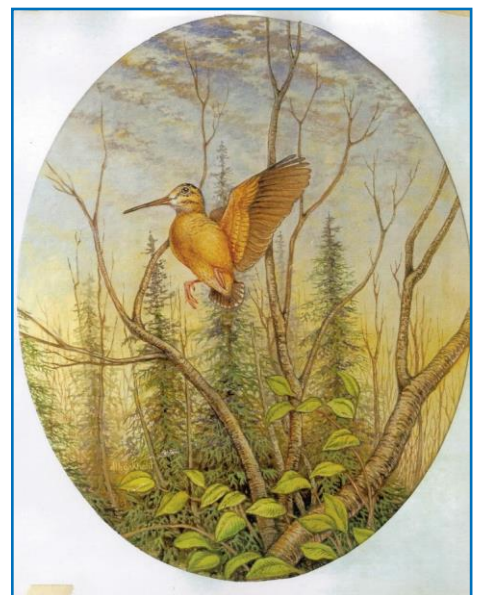
The habitat needs of these birds vary with the seasons. In spring they need clearcuts near wooded areas with long grassy runways for their aerial flights. **Nesting cover** must include thicket edges, old brushy fields or clumps of young evergreens. Shrubby areas near springs, marshes or streams provide the moist soil they need for feeding and higher, drier ground nearby provides a safe place for roosting.

Woodcock nests are simply a dent in the ground with a cushion of dead leaves. Sometimes camouflaged with twigs or pine needles, the site is difficult to find. About four eggs complete a clutch. The eggs are smooth and buff-colored with dark blotching or speckling. At about three weeks the **eggs hatch by splitting length-wise, a feature unique to woodcocks.** The chicks are **precocial** and able to follow the hen immediately after drying. Still, like most precocial birds, the hen will brood the chicks with her wings or body in poor weather or when danger is nearby. Within a month of hatching, the chicks are full-grown and can fly. Woodcocks usually only raise one brood of chicks each year, unlike many songbirds which may raise two to three. Anything that threatens their populations can lead to a quick decline in their numbers.

Snipes also nest on the ground but prefer the edge of a bog. Their small cup-shaped nest is lined with grasses. It may be placed down into sphagnum moss and may have a canopy of plants hiding it. After the eggs have hatched, **the male and female may split up the precocial chicks and each take several birds to care for.** Snipe are not as common in Pennsylvania as woodcocks and may only nest in the northern portions of the state.

A Simple Review of Snipes & Woodcocks

Snipes and woodcocks are **odd-looking round-shaped** birds found in moist fields and meadows. Their **long bills** slightly widen at their tip and are **designed to probe into soft soil in search of earth-worms.** Both are beautifully suited for life on the ground with mottled brown and white plumage helping them camouflage against fallen leaves, up-turned soil and various kinds of vegetation.



The **common snipe** puts on a **wonderful aerial show during courtship**. It's called **winning**. The bird circles high into the air, circling as it falls back down toward earth. As it dives a whistling sound is produced as air passes through its short tail feathers.

When snipes raise their young, the **male takes care of the first two eggs that hatch, while the female takes care of the last two hatched eggs**.

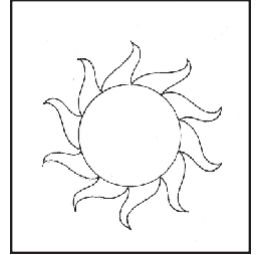
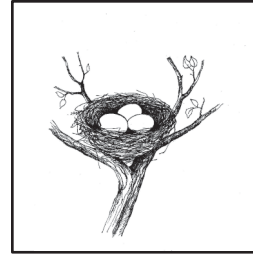
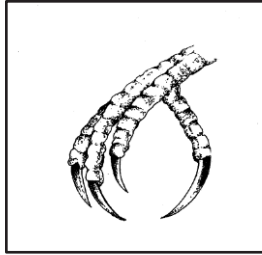
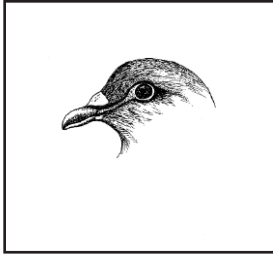
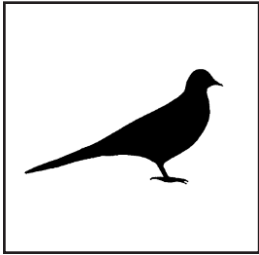
The **American woodcock** looks similar to the snipe except the woodcock has black barring across the top of its head from side to side (sort of like a small stack of wood). The snipe has dark barring across the top of its head from front to back. **Both have very large round eyes**. Woodcocks prefer open woodlands a bit more than snipes. Both can be found in damp, overgrown meadows.

When the **woodcock calls** it sounds a bit like a flying nighthawk, kind of a **nasal-like "peent."** Woodcocks are **also known as timberdoodles** and like the snipe, put on an aerial show during breeding season. They are most active at dawn and dusk. This is called being **crepuscular** (rather than diurnal or nocturnal). When their **eggs hatch, they split lengthwise** from end to end. Most other bird eggs hatch open in the middle.



Doves & Pigeons

Order Columbiformes
Family Columbidae



Both doves and pigeons belong to a family of birds that is large and found worldwide. The mourning dove is native to North America, while the rock dove or pigeon originated in Europe, Africa and Asia. The pigeon has long been associated with human settlements and migrated with people as they spread across the globe.

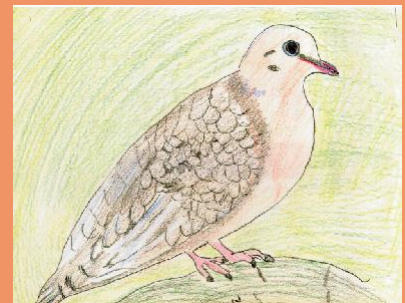
These birds are seed eaters, though they do not have a large seed-cracking bill like grosbeaks. They feed on smaller grains and seeds, occasionally eating some small fruits, insects or crustaceans such as snails.

Both pigeons and doves are fast, strong flyers. Doves can reach speeds of 50 mph and quickly change course mid-flight to escape a predator. Pigeons can maneuver quickly too, but despite their speed and agility in flight, pigeons are the primary prey for our city-dwelling peregrine falcons in Pennsylvania.



Mourning Dove

Zenaida macroura



The beloved mourning dove is **elegant and slender-tailed**. Their soft brown plumage and mournful cooing make them a favorite backyard bird, yet they are one of the most popular game birds in the state. Often seen perching on telephone wires or searching the ground for small seeds, mourning doves are **capable of extremely fast flight**. They burst into the air on whistling wings, flying **in straight lines** to their next destination. Up to 13 inches in length, but smaller than a pigeon, their head is small and their bill is short and black. As with most ground feeding birds, flashes of white feathers can be seen on their tail when they fly. Each dove has a **pale blue ring around its eye and a single dark teardrop mark below each eye**. The legs and feet are red.



The male dove's poignant **cooing** serves to attract a female for whom he will repeatedly perform a mating dance to win her favor. The display consists of high flights and a fluttering descent. On the ground he will follow her while fanning his tail.

Their **nests** are somewhat haphazard, not much more than a **platform of sticks** placed horizontally on a limb, easily displaced in heavy winds.

Sometimes the female will use an abandoned robin nest, sometimes just lay her eggs on the ground. But **despite this casual attitude toward nest-building, doves are devoted parents.** The male broods the young throughout the day and the female takes over this duty all night. The **nestlings, or squabs, are fed "pigeon milk" by both parents.** This healthy liquid is secreted from the crop of both the male and female and regurgitated to the young. As the young mature they begin eating seeds, small worms and insects. **Prolific breeders,** one pair of doves may raise 5–6 broods each season.

Doves regularly roost in small flocks and begin their fall migration by mid-September. While **mourning doves may be found anywhere,** they prefer farmland with scattered trees and shrubs, woodland edges and suburban gardens.

Rock Dove (domesticated pigeon)

Columba livia



Rock doves, or pigeons, are undoubtedly the most common bird found in our towns and cities where they mob streets in search of surplus food or birdseed. Like house sparrows and starlings, the pigeon was brought to North America from Europe centuries ago and has prospered ever since. Large and plump compared to mourning doves, **their wings are pointed in flight and their tails are broad and round.**

Pigeons come in an array of colors, one of the reasons they have been a popular pet for ages. Their throats have iridescent feathers and wings are often barred with black marks. During nesting season, **multiple broods of young are raised on "milk," similar to doves.**

Pigeons characteristically move in flocks, whether searching for seeds on the ground or walking. **When they take flight they do so in unison, circling in the air several times as one large unit** until they settle down again.

Both pigeons and doves need to drink water every day and **have an unusual way of drinking.** Unlike other birds that need to lift their heads in order to swallow water, members of the Columbidae family simply **submerge their beaks into water up to their nostrils** and drink with their heads down **as if inhaling through a straw.**



A Simple Review of Doves & Pigeons



Doves and pigeons are ground-feeding birds that are among the first birds most children learn to identify. Both are known for their **cooing calls**, but the mourning dove's is more mournful and drawn out. When gathered in groups their flock is called a bevy. Pigeons, especially, travel and feed together. The mourning dove is most familiar to those living in the country or in suburbs while **the pigeon is the most common bird found in cities.**

They are both strong fliers but will use their wings to beat against one another if fighting over food or a mate. **Grains, seeds and fruit** make up most of their diet. In order to help them digest the hard seeds they eat, pigeons and doves **swallow tiny pieces of gravel.** The pebbles go into their **crop** (a pouch inside their throat) and help to grind up the seeds.

When they drink they only need to place their bill in water. **They sort of inhale the water**, using their bill like a straw. Other birds need to lift their heads after they take a drink so they can swallow water, but not doves and pigeons.

Rock doves or pigeons come in a wide variety of colors and patterns. This is probably because domestic pigeons have bred with wild pigeons over many centuries. **Pigeons have a unique ability to find their way back home**, no matter where they are. For this reason they have been used by people throughout history to deliver important messages, especially during war. Biologists believe the birds find their way home using the sun or the earth's magnetic field.



Both birds are believed to mate for life.

Their **nests are flimsy patches of twigs** that can be placed just about anywhere. Sometimes doves don't even build a nest. They just lay eggs on the ground.

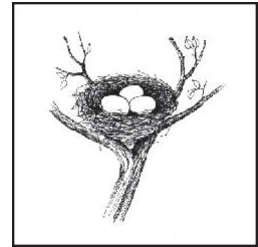
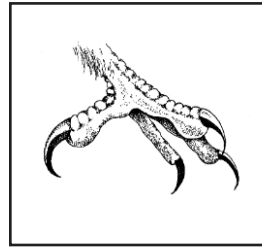
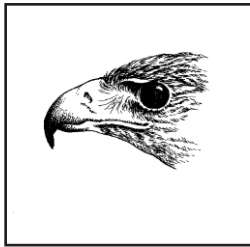
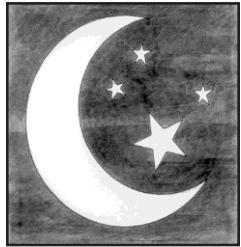
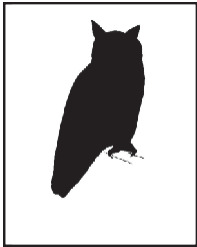
Once the chicks have hatched, **both male and female parents feed the nestlings** a special cheese-like substance they regurgitate called **"pigeon milk."**



Typical Owls

Order Strigiformes

Family Strigidae



Owls and hawks in Pennsylvania share many of the same habitats. They avoid serious competition over food thanks to their different hunting strategies. **Owls are nocturnal**, hunting the landscape at night while the diurnal hawks soar over the land in daylight. It's not that owls are unable to hunt during the day. Their eyesight is just fine, but **they are best adapted to see under low-light conditions because of lots of rod cells in their eyes.** We have lots of cone cells in our eyes that help us see color. Owls don't really need to see lots of color. After all, it's pretty dark when they are out and about.

Owls also have unique wing feathers which help them fly quietly. The front edge of each wing is serrated to reduce any sound from their wings. This helps them surprise their prey from above. Their heads are big for their bodies, giving them lots of room for their large eyes and wide-spaced ears.

Like all birds of prey they kill with their strong, sharp talons. They use their sharp, hooked bill to bite off pieces of food, although some owls swallow their prey whole!



Both male and female owls are colored alike, but **females are almost always larger than males.** The plumage of all owls is dense and soft, making them look much bigger than they actually are. **That dense plumage protects them from biting prey** they are trying to subdue and **helps insulate them from cold.** After all, what's warmer than a down coat or sleeping bag?



Owls are not brightly colored like a cardinal or blue jay. **Their earthy tones help them camouflage in their daytime roosts** so they can avoid detection and sleep undisturbed.

Owls don't build nests. They prefer to take over abandoned crow or hawk nests or nest in a tree cavity.

Our owls belong to the order Strigiformes but **are split into two different families:** Tytonidae (barn owls) and Strigidae (all our other owls). Let's begin with the Strigidae family.



Great Horned Owl

Bubo virginianus



The **Great Horned Owl** is our largest, most aggressive owl with a wingspan of almost five feet. They stand between 20–23 inches in height. Despite their strength and ability to take large, skunk-sized prey, an adult great horned only weighs about 3½ pounds. Like all birds of prey, the female is larger than the male. The beautiful muted brown, white and gray plumage is perfect camouflage allowing these elegant predators to roost against a tree trunk. This allows them to safely escape detection while they quietly rest throughout the day. There is a large patch of white feathers beneath their chin and **prominent ear tufts that resemble horns**.



Those upright feathers have nothing to do with the owl's ears. **All owl ears are asymmetrical openings in the skull.** As an adaptation the feathered “horns” probably help the owl appear even larger than it is or serve as an aid in breaking up their silhouette, helping them camouflage. **In early December the deep hooting calls** of these owls bellow from woodlands and forest edges, **signaling the start of one of the earliest breeding seasons in our state.** The *hoo-hoo-hoo hoo* calls help the males attract a mate and stake out a territory.



A mated pair nests in abandoned (or confiscated) heron, hawk or crow nest or a hollow tree cavity. The female may line the nest with feathers before she lays two-three eggs over the course of several days. **Incubating eggs as early as February, she may be covered with snow as she broods her eggs.** The chicks hatch in about a month, remaining in the nest for about three months until they can fly. During that time, the parents hunt food for them from an ever-growing mammal and bird population expanding in early spring.

Great horned owls prey on rabbits and rodents, squirrels, foxes, weasels, muskrats, domestic cats wandering out at night, and most notably, skunks. **Since owls, like almost all birds, have no sense of smell, the offensive skunk spray does not bother them at all,** and they routinely take the large black and white mustelids as a meal.

Owls often look robotic or animated. That probably has to do with their eyes. **In order to compensate for their enormous eyes, owls have lost the ability to move their eyes in their sockets.** This means if owls want to look at something, they must turn their head in that direction. If they want to look down, they must turn their heads down; to look up they must turn their head up. Some owls can even turn their heads over 270 degrees, almost the whole way around!





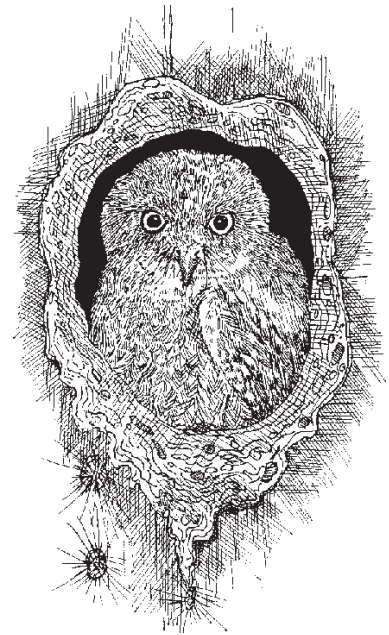
Barred Owl

Strix varia



Barred Owls are a bit smaller than great horned owls, but they share a similar size and wingspan with the much more slender barn owl. As their name suggests, these mostly gray owls have dark barring across their chest and streaking up and down their belly. Their heads are round and without ear tufts. **Barred owls and barn owls are the only owls in our state with brown eyes. All other Pennsylvania owls have yellow eyes.**

They are birds of lowland woods, meaning damp or flooded woodlands. Barred owls have a hoot similar to great horned owls, but quieter with a different tempo. If you put their call into words, it should sound something like, “**Who cooks for you? Who cooks for you all!**” (*hoo-hoo-hoo-hoo.... hoo-hoo-hoo-hooaw*) Barred owls usually **nest in hollow tree cavities**, laying 2–4 eggs.



When any owl catches prey that is mouse-sized, they will swallow that prey whole. Something larger requires the owl to hold the prey in its talons and use its beak to tear off bite-size pieces.

All birds of prey, including owls, produce pellets several hours after they eat a meal. They absorb all the nutrition possible from their prey, but all the indigestible parts (hair, feathers, bones, claws, insect chitin) are packed into pellets **which are regurgitated later.**

Also called castings, the pellets often accumulate on the ground under a favorite perch. Biologists study the contents of the pellets to determine what the bird has been eating.

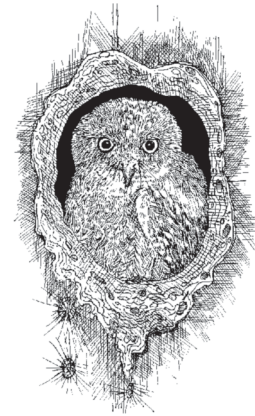


Screech Owl

Otus asio



About the size of a soup can, **the tiny screech owl is the only other Pennsylvania owl with ear tufts.** Those feather tufts can be held upright (bottom right) when the owl feels agitated. It probably helps them to appear larger to whatever is threatening them. When relaxed, the tufts are left down (middle right) giving the owl a round-headed appearance. At 10 inches long with a nearly two-foot wingspan, these diminutive predators weigh only 6–7 ounces.



Screech owls are dichromatic, meaning appear in two color phases. Being red (middle right) or gray (bottom right) has nothing to do with the bird's sex. In our state the gray phase is much more common than the red phase, and both color phases may be found in the same clutch of nestlings. On occasion, a third brownish color phase may be seen.



Screech owls call with a mournful, quavering whistle (*huhuhuhu*), repeated over and over. They will remain quiet if a great horned owl is active in the same area, though, because the larger owl sometimes feeds on the smaller owl. They **nest in hollow tree cavities**, often taking over after woodpeckers have moved on. They will also use a man-made nesting box built to their specifications. Four-five eggs are incubated for about 25 days, and the hatchlings can fly about one month after.



Screech owls will take small rodents, especially in winter, but insects make up the largest portion of their diet, along with frogs, crayfish and small birds. They hunt over open fields but live in orchards, forest edges and even populated areas if there are sufficient wood lots.



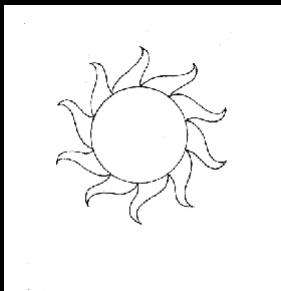
Long-eared Owl

Asio otus



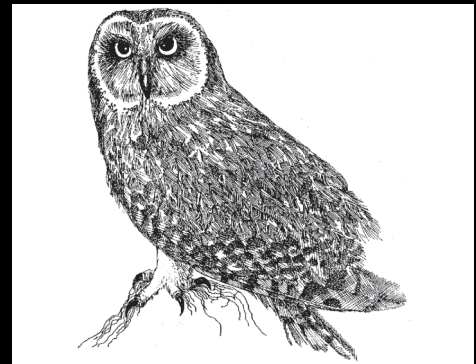
The Long-Eared Owl is less common than our other resident owls, but it is found in Pennsylvania year-round. Remote coniferous forests are their preferred habitat, so you are less likely to come across one. Long-eareds are about the size of a crow with a wingspan of 40 inches. They weigh about three quarters of a pound and stand about 16 inches high. The “ears” of the aptly named long-eared owls are just ear tufts. When their ear tufts are held up, the birds resemble a slender great horned owl. Their ear tufts are set closer together, and they have streaking on their belly.

Their hoot sounds dove-like with a soft repeating *hoo, hoo, hoo*. Using an old hawk or crow nest found in an evergreen tree, the female lays 3–8 eggs that will be incubated for nearly a month. Long-eared owls feed heavily on mice but will take insects and frogs.



Short-eared Owl

Asio flammeus



Short-Eared Owls are endangered species usually only seen here in winter. Like the long-eared owl, they are about the size of a crow, but these owls have small, barely noticeable ear tufts—hence, short-eared. Their plumage is a warm caramel-color, streaked with dark brown. They are **one of the few owls active during the day**. Short-eareds can even occasionally be seen hunting over their open field, bog and saltwater marsh habitats during the middle of the day.



When they fly, their irregular flapping flight follows close to the ground. Short-eared owls rarely make noise but will hoot *boo, boo, boo* or sometimes make a sneeze or barking sound. Mice make up most of their diet.

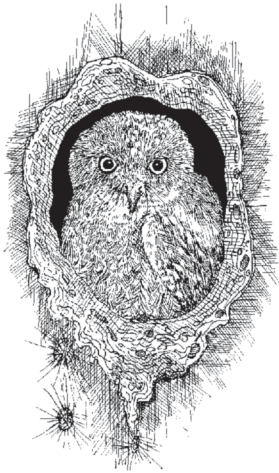
Sometimes a short-eared owl will stay in the state to breed and nest. When they do, they nest on the ground. They are still considered mainly a winter resident.



PA Game Commission Photo

Northern Saw-whet Owl

Aegolius acadicus



Of our winter visiting owls, the **Saw-whet Owl** is the most endearing. Similar in size to the screech owl, but without ear tufts, the saw-whet **is our smallest owl**. Only eight inches in length, they have an 18 inch wingspan and large yellow eyes. Their dark brown plumage is highlighted with white throughout.

They will search out abandoned woodpecker or squirrel cavities where the female will lay 3–5 eggs and incubate them while the male brings food to her. Their gentle *too, too, too, too, too* call sounds like **someone sharpening a wet saw**, which is how they got their name. Mice and insects make up their diet in the coniferous forests or dense thickets where they live. Both saw-whets and screech owls are preyed upon by larger owls.



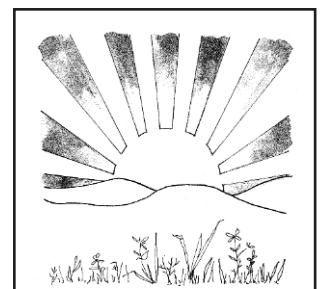
Snowy Owl

Nyctea scandiacus



Some people may mistake our whitish barn owl for the much larger, white **Snowy Owl**, but if you are lucky enough to spot this **Arctic bird** on one of its rare travels south to Pennsylvania, you will never make the mistake again. The snowy owl is a **substantial bird: bulky and up to two feet tall with a wingspan of 60 inches, they are our heaviest owls at about five pounds**. The pure white plumage is flecked all over with black. Their heads are round with large yellow eyes, and their legs are heavily feathered down to the toes. The heavy feathering helps to keep the birds warm in their normal frigid environment.

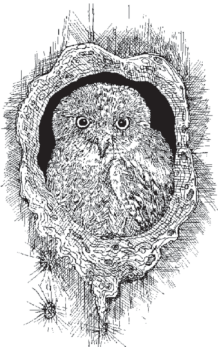
The tundra of the far north is their normal habitat, but if lemming and hare populations are scarce, the snowy owl makes its way down toward our state in November, hunting open expanses of fields looking for prey. Since large trees are not found in the tundra, when the birds appear here they are **usually sighted on the ground, low rocks or fenceposts**. **Usually active at twilight**, they are neither nocturnal nor diurnal, but **crepuscular**. However, they will adapt and hunt food when available.





Barn Owls Order Strigiformes Family Tytonidae

Tyto alba



The only Pennsylvania owl belonging to the Tytonidae family, the Barn Owl is known as the “monkey-faced” or “heart-faced” owl. Barn owls are **cavity-nesters**, known for their beautiful snowwhite face with coal-black eyes. The undersides of their body, underwings and legs are also white. But the topside of a barn owl is a soft pale reddish-brown and gray. **Once a threatened species in Pennsylvania**, the barn owl is still considered an **At-Risk Species** by the Pennsylvania Game Commission. Their well-being is closely tied to human activity, and help with their limited nesting requirements and food preferences.

They are about 20 inches tall and have a wingspan almost four feet across, but their pale coloring and long thin legs give them a lighter appearance than the other large owls. They weigh less than two pounds.

Barn owls do not have ear tufts and they do not hoot. **Barns owls do have a call—a scream actually.** They also whistle and hiss, but it is the blood-curdling scream that has put the hairs on end of many an unsuspecting observer of this “ghostly” owl.

Barn owls nest in cavities from March through May choosing among an available barn, silo, church tower, hollow tree or abandoned building. Up to 11 white eggs are laid on a bare or mostly bare surface within the cavity. The incubation takes about one month, with both parents feeding the chicks who take their first flights about 12 weeks after hatching.



Joe Kosack/PGC photo

Barn owls feed almost exclusively on small rodents they hunt at night while flying low over field and meadows. Because they feed so heavily on rodents, most farmers in the state welcome these birds nesting in their barns and silos. Some even install nesting boxes to encourage these “mousers” to take up permanent residence and help keep the rodent population under control. This saves farmers a great deal of money that might have been spent on rodent control and loss of rodent-spoiled harvest.

A Simple Review of Owls



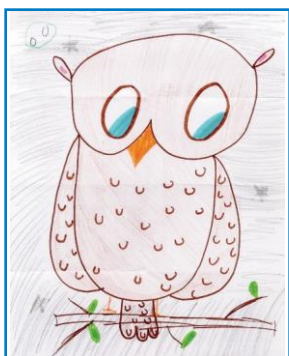
The birds we call “**birds of prey**” all share physical characteristics—**superb eyesight, large wingspans, sharp, hooked beaks and strong, sharp talons**—that make them excellent predators. Those birds of prey that are active during the day—eagles, hawks, ospreys, etc. are called diurnal birds of prey. Those that wait for **darkness** to begin their prowl are called **nocturnal** birds of prey—the owls.

There are two families of owls in Pennsylvania. The strigidae family includes all of our owls except one. The barn owl belongs to the tytonidae family.

Owls have some special features only they share. All owls have **asymmetrical ears**. That means that one ear is higher on one side than the other. Biologists believe this helps them pinpoint the location of their prey better in the dark.

Hunting in the dark probably explains why **owls have feathering down their legs**, too. It helps to protect their legs if their prey turns around and tries to grab them. Even though owls can see much better than you at night, it still may be difficult to see their prey clearly.

The **feather structure on the front of owls’ wings** keeps their flight as quiet as possible so they can silently approach their prey. The **disk of feathers around their face** helps direct sound back toward their ears.



Owls have **huge eyes** that have room for **lots of rod cells**. Those rod cells help them see in low-light conditions. We have lots of cone cells which help us see color, in our eyes. Because owl eyes are so big, their **eyes are fixed in their sockets**. This means if an owl wants to look up, they need to turn their head up. If they want to look down, they must turn their head down. They cannot move their eyes in their sockets like we can. But in exchange, owls have much **flexibility in their necks** and can turn their heads so easily sometimes it looks like they can look directly behind them.

Sometime **after an owl eats its prey**, like all birds of prey, **it regurgitates a pellet** of indigestible parts of their meal. The pieces of feathers, bone and fur are packed together in a dry pellet. Sometimes you can find a pile of pellets under a tree branch where an owl roosts. **Biologists study these pellets to determine what the owls are eating.**

In Pennsylvania we have eight different owl species. Some are here year-round and some only in the winter.

Our **largest owl is the great horned owl**, which is known for its booming “*Who-who-Who! Who! Who!*” call. They are **our earliest nesting birds**. The males begin hooting in early December and have been known to have chicks on the nest covered in snow. **Our smallest are the screech owl and saw-whet owl.**

Most owls have yellow eyes, but two of our owls, the **barred owl and the barn owl, have brown eyes**. Even though owls are nocturnal birds, the snowy owl normally lives in the Arctic where the sun never sets during the summer.

Every few years some **snowy owls** make their way as far south as Pennsylvania in the winter. When they do, they hunt during the day.

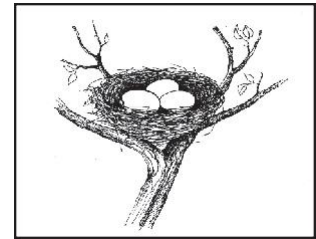
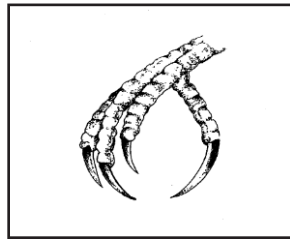
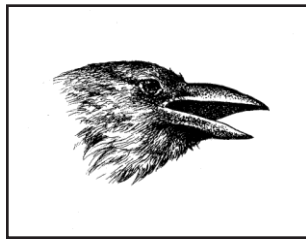
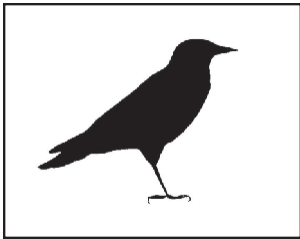
A group of owls can be called a “parliament” or “wisdom” of owls.



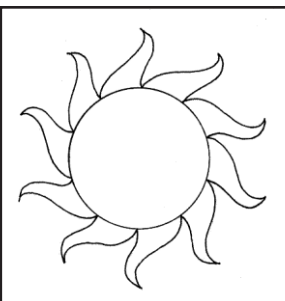


Crows, Ravens & Jays

Order Passeriformes
Family Corvidae



Members of the corvidae family are not known for their subtlety or shyness. Crows and jays are noisy, boisterous, tolerant of humans, and smart. Because of their **intelligence** they are quick to find new food sources, like a backyard feeder. When they do, they can overwhelm the area and drive other birds away. Ravens are much wilder and prefer Pennsylvania's remote wilderness areas. The birds are **physically adapted for a variety of habitats and flight patterns**, crows and ravens spend a great deal of time in the air. Their **bills and feet are well-suited to both prey on small animals and eat a wide variety of plant materials** from fruits and berries to seeds or even larger acorns.



Blue Jay

Cyanocitta cristata



Blue jays are considerably bigger than a robin, at almost a foot in length from the tip of their **prominent head crest** to the tip of their tail. Their **blue bodies are boldly marked with black and white**. Their large straight bill is a tool for grabbing food and hammering at it before eating. They can easily hold an acorn in their feet and chisel into it with their bill.

Preferred jay habitats are woodlands, partly wooded suburbs, farms or even city lots, as long as they can find food. **Jays are true omnivores**, though most of their diet comes from acorns, beechnuts, corn, grain, fruits and berries. They will eat carrion when they find it. All kinds of insects and

small animals make up the remainder of their diet: ants, caterpillars, beetles, grasshoppers, spiders, snails, frogs, small rodents, and even the eggs and nestlings of other birds. **Blue jays are also one of the few birds that will eat the caterpillars of both the gypsy and tent moths**, helping contain these major pests in Pennsylvania's forests.



Blue jays are like chipmunks—when mast supplies are high, they actually **pack their throats with the extra food** and disgorge it later to eat or to cache away for a later meal. They are also **extremely vocal birds and great mimics**. Part of their name comes from their loud call of *jaay*. The call helps to sound an alarm to call other jays. They have many other calls along with a mockingbird-like ability to imitate other birds, especially the shrieks of hawks soaring overhead. These versatile birds can also make soft, melodic sounds that are especially attractive.

In spring, jays engage in elaborate breeding behavior involving one female and many males, perhaps as many as 10 young males who follow the female. Competing calls and aggressive body movements eventually lead to the female choosing her one mate. **After building some dummy nests of twigs, both the male and female build the nest** where they will raise their brood in an evergreen shrub or tree up to 50 feet above the ground. The nests are about eight inches across and built of twigs, bark, mosses and leaves. When it's complete, the adults may line the nest with fine rootlets they have collected.

Three to six pale olive or buff-speckled eggs are laid in May or June. **Both the male and female quietly incubate the eggs**. But if they sense danger, they call loudly and aggressively defend the nest by diving at any intruders. Both parents also share in feeding the young, even after they are almost adult-sized and have long-since fledged from the nest.

Blue jays and other blue birds attract a lot of attention for their beautiful plumage. The **blue feathers are not a result of pigmentation in the feather; they are the result of their unique structure**. The feathers do not absorb the blue part of the light spectrum, causing it to scatter and giving an appearance of blue. **Consider the beauty of these birds an optical illusion**. Indeed, under certain lighting blue jays, bluebirds, indigo buntings and others look very gray, but in the right light they are stunning.





American Crow

Corvus brachyrhynchos



American crows are common, but that doesn't make them any less spectacular. They are clever, curious and extremely intelligent birds who **love to collect or "steal" all kinds of strange treasures** like shiny pieces of glass or metal, rings, pens and keys. Like blue jays, crows are **masters at mimicry** imitating other bird songs, whistles, cat meows and even human voices. They also have their own distinct *caws*, coos and soft sounds, which they use to communicate among their own species.

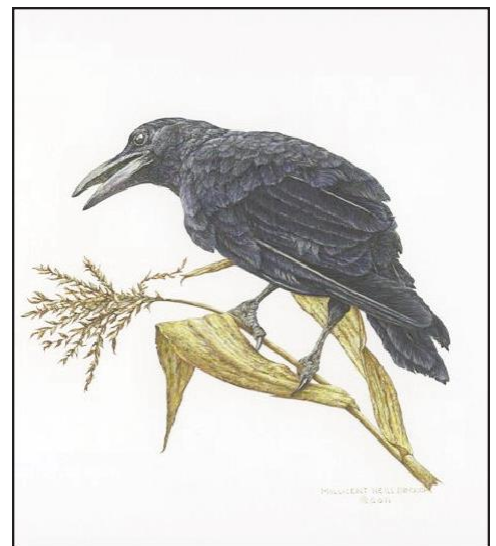
Crows are well-adapted to human activity, but their behavior is not always appreciated. With habits of pulling up growing corn or robbing the nests of game birds, they can be considered pests, but they can also be beneficial. **Their varied diet includes harmful insects like tent caterpillars, locusts and grubs.** They will gladly eat carrion, helping to clean up road-killed animals.

In winter, crows may **congregate in huge flocks** (called a **murder of crows**) wherever the weather is mild and food is plentiful. They roost together at night, often at roost sites established decades ago. At daybreak they fly off in smaller groups in search of food, returning to the roost each evening. Their **favorite habitat would be farm fields with scattered woodlands.** The farms provide a diverse supply of food, and the woods provide roosting and nesting sites. Crows are highly adaptable and can be found in suburban areas, towns, and even large cities.

Crows are large birds, up to 18 inches in length with a wingspan up to three feet. Both males and females are completely black with iridescent blue, green and purple sheens in their feathers. They have a strong bill and excellent sense of sight and hearing. **While feeding in flocks, a sentry crow will post guard** uttering a single loud *caw* for the flock to fly off if necessary. Crows are agile and skilled at evading larger predators such as hawks, eagles or owls, especially the great horned owls, with which they have an embattled relationship.

When mating season arrives, the large flocks break up and the **male crows put on spectacular flights to impress a mate.** Paired crows both help build a nest of sticks, bark and vines in woodlands up to 70' above ground in the crotch of the tree. The **big nests, perhaps two feet across,** are lined with moss, animal fur (**deer hair is a favorite**), grass and feathers.

In April or May as many as six oval, bluish-green or spotted with brown and gray eggs are laid and incubated by both male and female. The chicks hatch after about 18 days and fledge from the nest at five weeks of age. Family groups stay together for almost a year as the **young learn to survive by imitating and mimicking the adults.**





Common Raven

Corvus corax



Spotting a **Common Raven** in Pennsylvania today is an event. **At one point in our colonial history, they were believed to be extant** (extinct within the state). Today they can be seen mostly in the commonwealth's northcentral region where their preferred **mountain terrain and remote forests** are found. They are big birds with **wingspans up to four feet and a body length up to 25 inches**. Jet black with some green and purple iridescence feathering, the males are larger than females. If you saw a raven by itself you might confuse it for a large crow, but if you saw them together you would have no problem distinguishing one from the other. **Ravens are nearly twice the weight of crows with distinctly larger bills**. The **feathers ringing the raven's neck are shaggy-looking**, giving the raven a "wilder" appearance. Their tail is more wedge-shaped than the crow's and overall they are just bulkier.

Ravens are also more physically adapted for soaring than crows are. During fall migration of birds of prey, the raven is more likely to be seen soaring with our diurnal predators. They call out a hard *tock* sound along with guttural croaking and gurgling noises.

Ravens put on amazing aerial displays during courtship. The male raven sometimes carries a large stick in courtship flights or during nest building. Their **nests are built on cliffs or at the very tops of large, mature trees**. Constructed from sticks and vines, the nests are often added to each year and can be **up to four feet in diameter and one foot deep**, lined with the same materials as crows use. Up to six oval dull greenish eggs with spots hatch after about three weeks. Unlike crows, ravens need more isolation in order to successfully raise their young, who are able to fledge from the nest about one month after hatching. Like crows, ravens are intelligent birds that learn by mimicry, but unlike crows they remain "wild." Their interest in scavenging sometimes brings them into closer contact with people and civilization.

All members of the corvidae family are bold and willing to take on much larger birds if they feel their territory is being encroached upon. "**Mobbing**" hawks and crows is common as they try to de-roost and drive the other birds away. In the photo at right a raven is about to send a bald eagle on his way.

Fish Crows (*Corvus ossifragus*) are slightly smaller than American crows and never found far from the coast or large rivers. They can be identified by their *car* or *cah-cuh* call. Their scientific name literally means "bone-breaker" and they can easily take fish, crabs or whatever they can scavenge or steal from gulls and terns.

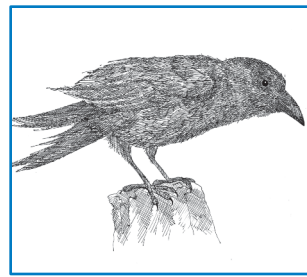
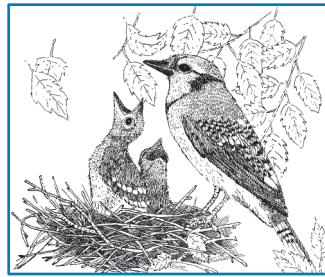




A Simple Review of Crows, Ravens & Jays



You may think that crows and ravens are blackbirds, but they belong to a different family of birds, along with the blue jay. It's true, they are black. But these **large, noisy birds all belong to the Corvidae family**. They are **intelligent, bold birds** that like to make their presence known. They **will eat just about anything** they can get hold of and are considered **omnivores**. Fruits, seeds, insects, even small birds, reptiles, amphibians, fish and mammals may be taken.



Blue jays are common backyard birds that squawk, whistle and warble. As loud as they sometimes are, jays can utter soft warbling songs, too. They **are great mimics**, imitating whatever birds or human sounds they hear.

Blue jays have even been observed using “tools” to help them grab food. **Like all blue birds**, their beautiful coloring is the result of feather structure, not pigmentation. **Their feathers are built in such a way as to refract light**. Depending on the light, sometimes they are a brilliant blue, sometimes gray.

Crows are bigger than jays. The large black birds are known for their loud, familiar “caw, caw, caw” call, and their **fondness for shiny objects** they often collect. Some biologists even think crows can count. Like grackles, crows will also stand on an anthill and let the insects crawl over their body, probably to help control parasites.

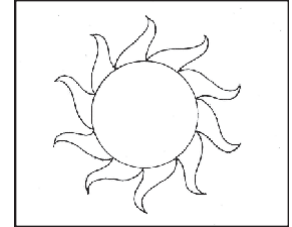
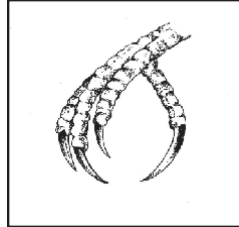
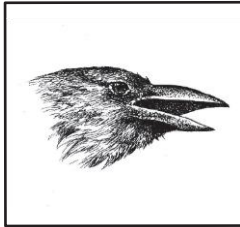
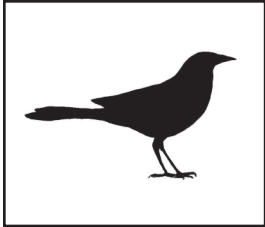
Would you believe a group of crows is called a “murder” of crows? Both crows and ravens have appeared in books as symbols of dark character. The poet **Edgar Allen Poe** titled one of his most famous poems, “The Raven.” It began, “Once upon a midnight dreary...” and throughout the spooky poem the raven speaks only the word, “Nevermore.”

A speaking raven is not impossible. Like jays and crows these large, raggedy-looking black birds are intelligent mimics and can learn words. They have also been known to pull on the tails of animals just to pester them. In Native Americans’ folk stories, ravens are called “tricksters.” **They are superb flyers and have even been known to fly upside down**.

Blackbirds

Order Passeriformes

Family Icteridae



Blackbirds—who are certainly not all black—belong in the **Icteridae family**, which refers to a New World family meaning these birds **are only found in the Americas**. When they are not raising their young, blackbirds are very social birds and can often be seen moving and feeding together in large, mixed flocks. In summer they feed mostly on insects, providing a great service to us. But in winter they turn to a diet of seeds and grains and have been known to strip farm fields. **Their amazing ability to take flight in huge flocks, undulate through the sky together and swiftly turn direction as a single unit is still the subject of much study** by ornithologists trying to determine how they avoid colliding with one another. Blackbird flocks are a sight to behold.



Eastern Meadowlark

Sturnella magna



Both the male and female eastern meadowlark can be identified by bright yellow breasts marked with a large bold black V. Their backs are brown with soft streaking. When they are flushed into the open, they show distinct white outer-wing patches.

True to their name, these plump birds with short barred tails **need open meadows and old pastures in which to live**. The old fenceposts in such habitats serve as perfect perches for their flute-like song. The male **sings with enthusiasm to establish his territory and protect his family**, which may include two or three females and their nestlings.

After arriving in spring, they **feed** during the warmer months on a **variety of insects**, seeds and grains. Meadowlarks rarely come into backyard feeders, but if you live near a farm or an open meadow you may be able to attract one with some scattered grain left on the ground.



The female builds a hidden, grassy nest on the ground, usually in fields, about 10–20 inches high. The nest is woven into a **dome shape with a side entrance**. Because of their nesting preferences, meadowlark nests are often accidentally mowed over in the farmer's fields. Three to five eggs are laid in late May–early June, prime harvest time. As development has overtaken farmland, meadowlark populations have been on the decline for some time.



Common Grackle

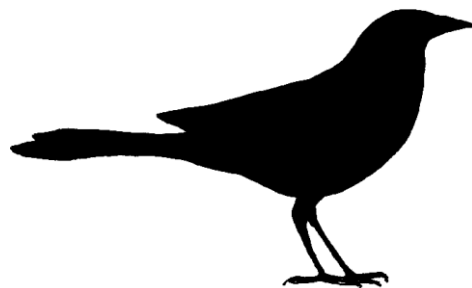
Quiscalus quiscula



Common grackles are large birds, almost a foot in length. Their **iridescent black plumage** shimmers with purple, blue-green and bronze tints, and they have a long-keeled or rudder-like tail. Grackles eat insects, seeds and fruits, but they are **big and tenacious enough to take a small mammal like a field mouse on occasion**.

They tolerate other grackles throughout the year and will even **nest together in colonies**, often found in evergreen trees. Males put on a display for females by fanning their wings and tail, ruffling feathers and tilting their bills. Females quiver their wings in response. Their twig nests are loose, bulky and large, up to 8" high. **She lines the nest twice, once with mud and then with fine grasses and feathers**. A typical clutch has 4–6 eggs.

As much as red-winged blackbirds herald spring, **the gathering of grackles in late August and early September is a sure sign of autumn**. Moving through the woods in large flocks, the sound of their "rusty-hinge" squawks and their wings swooshing in unison as they maneuver through the branches is an experience not soon forgotten.





Brown-headed Cowbird

Molothrus ater



Brown-headed cowbirds are common backyard birds often seen in mixed flocks with red-wings, grackles and starlings. They are **called cowbirds for their habit of following cattle, or historically, bison, in search of the insects kicked up by the shuffling hooves of the large, slow-moving mammals.** Cowbirds are black with a distinct brown head, and while they may not stand out with attractive plumage, **they do have one of the most peculiar nesting behaviors of any of our birds.**



Cowbirds are called “brood parasites.” This means **they do not raise their own young.** They let other birds do that for them. After breeding, the female finds the nests of other species of birds in which to lay her eggs. She will deposit one of her eggs while the other female is away. No species is safe from cowbirds since they have been known to lay eggs in the nests of over 200 species. **Most females of other species accept this new, larger egg, and continue their incubation.** When hatched, the cowbird chick is often larger than the other birds. The larger nestling gets more food since the noisiest, most active chick in the nest is the one fed first and most often.

Some studies show the cowbird’s behavior has little effect on the decline of parasitized bird species, while others suggest that cowbirds, along with the loss of habitat, play a large role in the decline of small songbirds whose nests are most often parasitized. Nevertheless, it certainly is a successful evolutionary tactic for these birds as their numbers continues to flourish.



Red-winged Blackbird

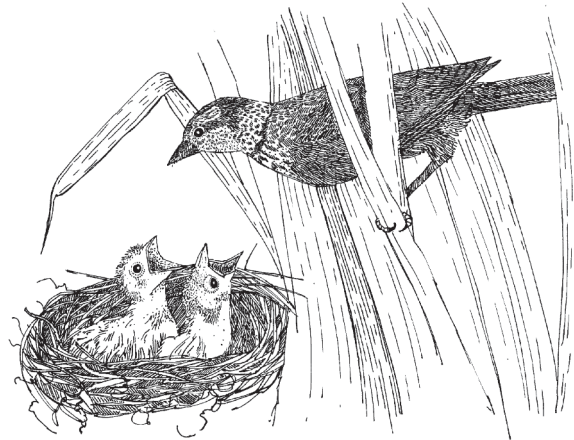
Agelaius phoeniceus

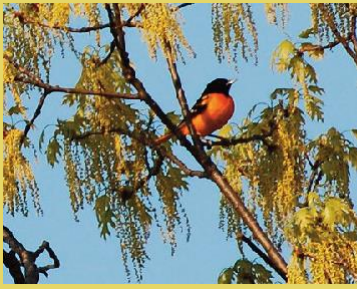


We all have our harbingers of spring: the male bluebird scouting out a backyard nesting box; the first crocuses pushing up through the soil; the trilling of toads in a vernal pond. **For me, it is the “ook-a-reee” of the male red-winged blackbirds.** Icy winds may still be blowing as they warble their song and wave their red epaulets from atop a cattail reed, but spring is on its way!

Adult males are about nine inches long with solid black plumage and epaulets of brilliant red and yellow on each shoulder. The colorful patches are flashed when the male sings or defends his territory during breeding season. **Females**, who arrive at the marshlands, wetlands and damp meadows several weeks after the male, **are brown marked with streaks of buff.** The immature male looks like the female except for the telltale epaulets.

Females weave an open cup nest around cattails or other aquatic plant stems placed above the water. Sometimes nests are built on land, in which case they are well camouflaged in tall grasses or shrubs. The bluish eggs are streaked with dark markings and incubated for several weeks. Both parents feed the nestlings, and usually only one brood is raised each year.





Baltimore Oriole

Icterus galbula



Baltimore orioles may be more familiar to your grandparents than to you. Like the eastern bluebird and eastern meadowlark, their **lyrical songs and vibrant colors** of these birds were a much more recognizable a generation or two ago when family farms and clusters of woodlands dominated the landscape of the southern portion of our state.

Sometimes called the northern oriole, the **male has a bold orange body and black head. The female's plumage is muted yellow with brownish wings.** Orioles feed on insects and fruits and can sometimes be coaxed to a backyard feeder with slices of fruit, like oranges, and sugar-water stations.

Their nest is one of the most recognized of all nests, even if you have never seen one yourself. Woven from plant fibers, the **gourd-shaped nest hangs from the end of a branch high up in a deciduous tree.** The female shapes the nest by moving around within it. When she is finished building, she lays 3–6 eggs that hatch within two weeks. Usually only raising one brood each season, orioles migrate back south as early as July or August.



Orchard Oriole

Icterus spurius



Orchard orioles are probably mistaken quite a bit for Baltimore orioles, but instead of bright orange, the **male is more the color of a dark pumpkin with a black head, wings and tail. The female (at right) is olive and yellow.** The habits of this robin-size oriole are similar to the Baltimore oriole except **its hanging nests do not swing as freely as the Baltimore's.**



Bobolink

Dolichonyx oryzivorus

Bobolinks prefer the cooler northeastern and northwestern portions of our state. Males are black, with white backs and a mustard-yellow patch on the nape of the neck; females are brown-streaked. They nest in damp meadows or farmer's hay fields. Adults **land near the ground nest and quietly walk to the nest.**



European Starling

Family Sturnidae
Sturnus vulgaris



Jake D. B. / PGC photo

Some animals have a bad rap, whether they actually do anything wrong or not. **Such is the case with the European starling.** Even their scientific name, *vulgaris*, suggests something ill-mannered. Introduced into New York's Central Park in the 1890s, starlings are a classic example of an **invasive species**. In their native Europe, starlings are not a problem at all. But when animals are introduced from one region to another, one of several things may occur. They may die off because of new parasites or diseases to which they have no natural resistance. They may acclimate to their new surroundings successfully, eventually becoming a natural part of the habitat without causing any problems. Or they **succeed so well in the new habitat that they overpopulate, often driving native species into decline.** If this last scenario occurs, they are considered an invasive species—a serious threat to native species in habitats around the world. Keep in mind that invasive species are a man-made problem.

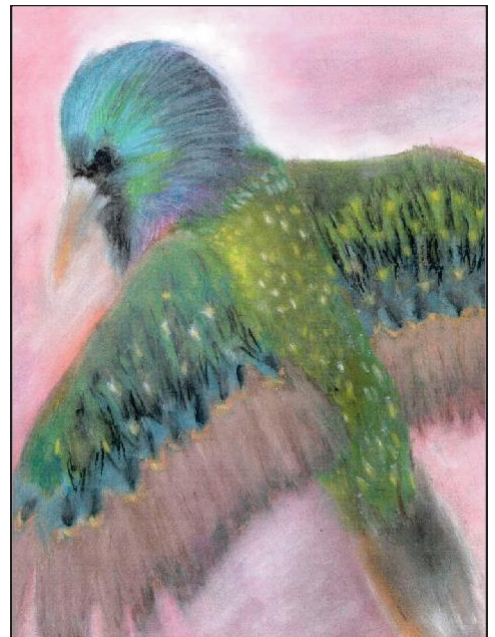
Despite a short, stubby appearance, starlings are quite attractive birds if you look closely. When the sunlight hits **their black plumage, they are speckled with iridescent purples, blues and greens.** Their tails are short and the yellow bill is long and straight. **In flight they glide in a triangular silhouette.**

Starlings feed on insects, grains and fruits. They love to root through grass roots, **digging underground with their bills to pull up beetle larvae, which is certainly a benefit to us. Starlings will even eat stinkbugs!** This might actually put them in good favor with most people since stinkbugs are another invasive species starting to wreak havoc throughout the Northeast.

But it is their nesting habits that cause the most harm. From the small population of starlings released in Central Park over one hundred years ago, we now have over 200 million starlings living in North America. Good news for starlings. Bad news for many of our native birds, especially bluebirds.

Our eastern bluebirds struggle each year to find nesting cavities, competing with the overly aggressive starlings. Bluebirds have very specific nesting requirements: a cavity in an open field. Starlings don't need to nest in a cavity. They can build nests just about anywhere. This makes their preoccupation with cavities especially frustrating. The bluebirds need them; the starlings do not.

But starlings could also be considered marvels at adaptation. Despite being placed in what could have been a hostile environment for them, they have thrived. **You can't blame these colorful little birds for being survivors!**





A Simple Review of Blackbirds

The first thing you may notice about blackbirds is that **not all blackbirds are black**. There is a wide variety among these birds. The beautiful orioles are blackbirds, as are meadowlarks, red-winged blackbirds, cowbirds, grackles and bobolinks.

Eastern meadowlarks prefer to live on or near the ground. Known for their warbling song, often from atop a fencepost, meadowlarks are birds of open farmland. Even though meadowlarks and starlings are not really related, the scientific name of the meadowlark (*Sturnella magna*) means “large, little starling.” They do share similar short-tailed, stocky body shapes and flight silhouettes like flying triangles.

Common grackles are fairly large blackbirds, about the same length as a blue jay. When the sun strikes their black feathers at just the right angle,

they sparkle with beautiful iridescent purples and greens. Their eyes are bright yellow. Grackles are easy to identify in flight. **They have a long tail that is held out behind them like a ship’s rudder.** Their tail probably helps balance them while they travel in large flocks that swiftly roll and change direction in flight.

Grackles prefer to walk on the ground instead of hopping like most other birds. They also have this **neat habit of allowing ants to crawl over their bodies**. Since ants secrete something called formic acid, some biologists believe this helps to rid the grackles of parasites.

Brown-headed cowbirds also spend a lot of time on the ground, feeding on insects, spiders, fruits and seeds. They really do have brown heads with darker bodies. They can be found on farms and in fields and neighborhoods. They call a group of cowbirds a “herd.”

Cowbirds **are called brood parasites**. This means they put their eggs in to the nests of other bird species, so cowbirds never really raise their own young. They let other birds do that for them. Cowbirds got their name from following cattle and bison on the Great Plains. As the large animals grazed, their heavy hooves kicked up insects whenever they stamped the ground. The intelligent cowbirds learned this was an easy way to find food.

Red-winged blackbirds prefer to live among the cattails in marshes or wetlands. The male is one of the first birds to begin singing in late winter. When he sings, the bright red feather patches, called **epaulets**, on his wings are displayed in an effort to attract a mate.



Both the male **Baltimore and orchard orioles** are black and orange, but the orchard oriole is a bit darker and smaller. The female orioles are yellowish-green. Known for their melodic whistling songs, orioles prefer to live among the mature trees of open woodlands. The Baltimore oriole is the state bird of Maryland, and its baseball team of the same name is named after the bird. The **Baltimore oriole builds a free-swinging, gourd-shaped nest that hangs down from a branch.** The orchard oriole's nest is similar but does not hang from the branches or swing freely.

Actually, even though **starlings** are grouped together with other blackbirds because they so often flock together, starlings **belong to a different family, Sturnidae.** All other blackbirds belong to the Icteridae family.

Unfortunately, **starlings can cause problems for some of our native birds.** They can be aggressive towards birds like bluebirds and often take over their nesting cavities. Starlings are great mimics and are related to the myna bird, well-known for its ability to mimic songs and voices. Starlings were brought to our country from Europe over one hundred years ago and introduced into New York's Central Park. Why? Someone thought it would be a good idea to have all the birds mentioned in the plays of William Shakespeare living in Central Park.