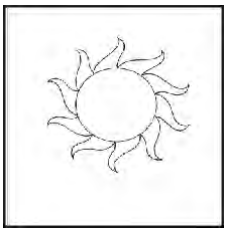
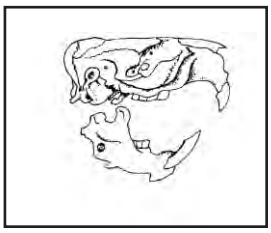
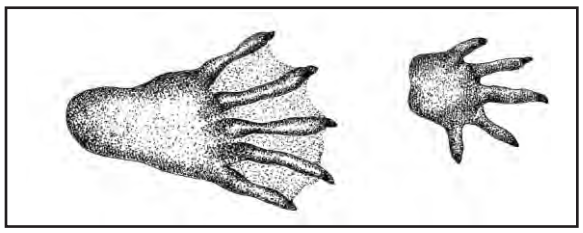
Beaver

Family Castoridae

Castor canadensis







The beaver is the largest rodent in Pennsylvania and in North America. Best-known for its enormous front teeth and ability to cut down trees, the beaver has a unique set of physical and behavioral characteristics allowing it to thrive in a semi-aquatic habitat.

Beavers were plentiful when European colonists first arrived and quickly became a source of income. Their thick pelts were used to make top hats and clothing trims. Beaver fur was so in demand that new trapping expeditions helped propel the expansion of American by initiating the exploration of the West.

But by the end of the late 1800s, uncontrolled trapping had all but eliminated beavers in Pennsylvania and elsewhere. The good news is that an active PA Game Commission wildlife management plan has helped the beaver return to its original territory, and their populations are stable once again. Stable, that is, where beaver habitat is still found in our state.

Like all rodents, the beaver's front teeth never stop growing. They must chew wood and other vegetation to keep their incisors in check. Beavers are **herbivores.**

In addition to wood, beavers eat a variety of soft plant material like grasses, ferns, mushrooms, even algae. They'll take leaves, stems and roots of aquatic plants such as cattails and water lilies. And the bark, twigs and buds of many trees are favored too, especially aspens, alders, cherries, maples, willows and birches.

If there is plenty of soft food available, beavers usually only cut down trees for their dams or lodge repair. **They'll cut and carry branches or small logs to the bottom of their home ponds** and anchor them in the mud. This gives them access to food when the pond freezes over in the winter. Beavers can also create air space under the ice by removing sticks from the dam to lower the water level, if necessary.

A beaver can close its lips behind its large orange-stained incisors. This enables them to carry wood underwater or even gnaw on wood while swimming.

Adult beavers weigh up to 60 pounds. Their stocky bodies can be 40 inches in length, with rounded head, short neck and legs. Their highly-valued coat is glossy brown above and pale beneath with a dense underfur covered with longer guard hairs. The pelt is thick and has a great deal of body fat to insulate the beaver, permitting it to stay in cold water for long periods.

Beaver tails are scaled, wide and flat. Nearly a foot long and six inches wide, the tail is used as a propeller and a rudder when the beaver swims. It also serves as support when the beaver is sitting upright gnawing on a tree or as a signal. When alarmed, the beaver will slap its tail loudly on the surface of the water.

The front feet and long claws help beavers dig and work on dams. But they can easily manipulate food with a small "finger" that acts like a thumb. The broad hind feet are webbed between the toes, which also helps them swim. **Beavers even have a split claw used for grooming on the outside of each hind foot.**

Most food is located by smell, and their sense of hearing is acute. While beavers are powerful in the water and can stay submerged up to 15 minutes, they amble slowly on land. When submerged, **membrane valves seal their ears and nostrils to keep water out**. Their eyesight is weak, but like many aquatic animals, their eyes are placed toward the tops of their heads, enabling them to see above the water while most of their body is hidden underwater.

Even though beavers are well-known for their ability to cut and fell a tree, they cannot make the tree fall in a particular direction. They cut trees within a few hundred feet of their water supply, dragging saplings to their dam or even digging small canals from their pond to the cut tree in order to float logs back to the dam.

Once the tree is down the beaver will feed on fresh greens, buds and twigs growing on the branch tips. The remaining branches are gnawed into pieces used in building dams or lodges. **The dome-shaped stick and log lodges are used for shelter**. The den, which has a small hole at the top to allow fresh air in, can be five feet tall. In winter when the mud-plastered lodge freezes, it is almost impossible for a predator to invade.

The entrance to the lodge is in the middle of a pond and is always below water. But the den itself is dry and located above water. Beavers that live in fast-moving streams or rivers may build their lodge at the water's edge or burrow into the bank to avoid fighting the strong currents. Most beaver lodges are found in remote areas with a water source.

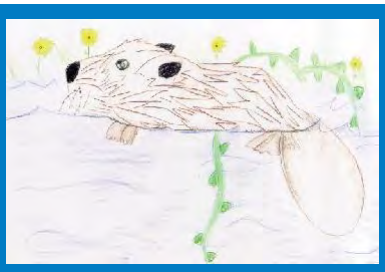
Beavers need water for their own habitat, and their habit of dam building creates a new habitat which benefits many other species. Once a dam is created, an open pond is formed behind the dam. Any trees standing in the wooded valley the beavers occupy may have their roots flooded, eventually killing those trees. Within a few years the dead tree "snags" provide homes for many cavity-nesting mammals and birds (like the pileated woodpecker, below).

The pond the beavers create can be as large as several acres, effectively beginning a chain of events in a thriving, constantly changing wildlife habitat, even long after the beaver has left the area. A variety of birds, reptiles, amphibians, insects, mammals and fish will create diversity as they immigrate to the new pond (great blue heron and painted turtles, below).

In time the beavers will use up their own food supply of timber and move on, but the pond will continue to evolve. Like all ponds, silt begins to accumulate, along with leaves and other plant material, slowly filling in the pond. Once the pond becomes shallow enough, grass will start to grow in the rich, fertile soil.

The pond will succeed into a meadow. Then the meadow will be replaced by small bushes, shrubs and eventually trees. At each stage of **succession** different animals will take up residence to take advantage of the plant life for food and nesting purposes. Insects and small rodents that thrived in the meadow give way to deer, bear, grouse, turkeys and woodland songbirds when the meadow eventually becomes a woodland. Over time **this ever-changing habitat will become a wooded valley again for another beaver to find and change.**

Because beavers play such an important role in creating new habitats, they are considered a **Keystone Species.** They can also be considered a pest especially when their dams cause pastures or roads to flood, or they cut down trees we find important or create unwanted channels leading to erosion problems. But **beavers are important species in their ecosystem, creating important wetland habitat for a variety of other species** that are completely dependent on an aquatic way of life. Like all keystone species, if that one species is removed, the habitat it supports is often drastically changed, sometimes even destroyed. **This makes keystone species vital to certain ecosystems.**



A Simple Review of Beavers

The beaver is our largest rodent—almost four feet long—including their flat, leathery and wide tail. Most weigh between 45 and 60 pounds. That's big! Beavers are called aquatic mammals because they spend so much time in the water. That special tail of theirs helps them swim; they move it back and forth like a boat rudder. They can also use their tail for balance while eating upright or as an alarm. If danger is near, beavers will loudly slap the water with their tail.

Beavers have feet that help them swim. Their big hind feet have five webbed toes that propel them through the water. Their much smaller front feet are used to hold sticks for gnawing and to help them carry stones and sticks to construct their dams. Their fur is long and glossy. They groom their fur with special claws on the hind feet. And they even have **special glands that produce oils to help make their fur waterproof.** Did you know that top hats used to be made from beaver fur? When men wanted to dress in formal black-tie, they often wore a beaver fur top hat.

Like all rodents, **beavers have large, sharp, front teeth called incisors**. Beaver incisors are an orangy-yellow color. The big incisors can easily gnaw on wood for food and chopping up twigs for their dams. Beavers have ears and nostrils that are so small they can be closed when the beaver swims underwater.

Tree bark stripped off tree trunks near the ground might mean a beaver is near. They love twigs from aspens, poplars and alders. But **beavers will eat all kinds of plants**, especially water grasses and the roots of water lilies. In the fall, beavers begin to store branches and logs in the water near their lodge or bank burrow so they have food throughout the winter.

When beavers build their large lodges, they dam up small streams and create ponds. All around the pond are canals and runways for carrying food and building materials back to their lodge. The stick and mud dam can be as wide as 15 feet and as high as five feet tall. The dams do more than help beavers. Many other wildlife species like otter, mink, muskrats, deer, bear, waterfowl, waterbirds and grouse benefit from the flooded habitats. But sometimes people think the dams are a problem because of the flooding they may cause.

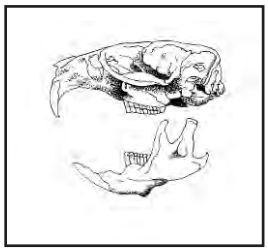
Beavers live in colonies made up of a family of five to a dozen beavers. Many biologists believe that beavers mate for life. After breeding in the winter, four or five kits are born in May or June. The **kits are born fully furred with their eyes open and their front teeth showing.** Though they only weigh about one pound at birth, beaver kits grow quickly. They will stay in their family colony until about two years old, when they leave home to start their own colony.

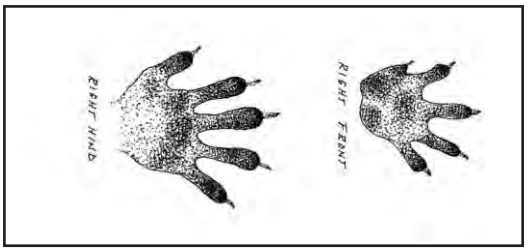
Most rodents don't live very long, but beavers do. **Some beavers may live to be as old as ten to twenty years old!**

Muskrat

Family Muridae

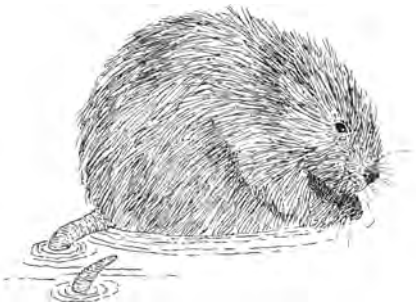
Ondatra zibethica





Muskrats are large rodents with rat-like tails. They can also produce a musky, strong-smelling liquid. That's how they get their name. Muskrats are at home in the water—true aquatic mammals found mostly in wetlands, marshes, ponds and along streams and rivers—wherever the water is still or slow-moving.

There is some similarity between muskrats and their much bigger cousins the beaver, but if you saw them side by side you would have no trouble telling which is which. An adult beaver weighs in at a whopping 40–60 pounds, but an adult muskrat is merely 2–3 pounds. Muskrats are about 22–25 inches in length, including the tail. That tail is flat like a beaver tail, but it is vertical or rudder-shaped as opposed to the beaver's large, flat tail. And the muskrat tail is used as a rudder as it paddles through the water. On land, the tail helps to balance them when they stand on their hind feet. Both the beaver (below right) and muskrat (below left) have scaly, mostly hairless tails.



The muskrat's front feet are small compared to its hind feet. The broad hind feed are partially webbed to help propel them through water, and the front feet are adapted for digging.

Their ears and eyes are small and their coats range from chestnut to black. **Well-designed to deal with cold water**, the muskrat's dense underfur covered by long, dark brown guard hairs provides excellent insulation in winter. **Muskrats do not hibernate** and need to keep feeding throughout the winter, even on a frozen pond.

Who is the number one furbearer in the United States? The mink, the muskrat or the fox? Believe it or not, it is the muskrat. A furbearer is the name traditionally given to an animal that has been hunted or trapped primarily for its fur or pelt.

Muskrats do not dam streams in order to build their lodges. Their lodges are built on ponds using cattail stalks or other vegetation, held together with mud and weeds. Muskrat lodges can be 10 feet across and three feet above water. Inside is a single living chamber with several tunnels. If they don't build a lodge, they may burrow into stream banks or earthen dikes, which can create leaks. Muskrats enter the lodge from underwater but live within the lodge above the surface.

When muskrats feed in dense marshland, they open up channels through the vegetation. This muskrat-created change in habitat is a tremendous benefit to waterfowl and other aquatic wildlife, like red-winged blackbirds and pickerel frogs (below). It offers nesting sites and access to food or shelter these creatures may not have been able to reach before the muskrats moved into the area. In this way, **a muskrat can be considered a keystone species.**

During winter, muskrats dig up the roots of aquatic plants from the bottom of the pond. They'll also feed on twigs, buds and barks of wetland trees, such as willows, cottonwoods, ash or box elders. **In warm weather,** they love to eat all parts of the cattails, bullrushes, water lilies, pickerelweed, and more. Just about any plant growing in or near water, including crops might be eaten. Even though muskrats are herbivores, they will sometimes dine on crayfish, mussels and the carrion of fish, frogs and other muskrats!

Muskrats have a stable population because they produce large litters throughout the year. They may have as many as four litters during the year if warm weather lasts. Muskrats leave a trail of musk scent to attract potential mates. Five to eight young are born blind and furless with each litter and are weaned and fully furred within a month.

Like many rodents who repeatedly produce large litters, **muskrats provide food for a wide variety of predators.** But the number one predator of muskrats is the mink. If a local muskrat population does get too crowded, muskrats will not breed, which control their own population.

A Simple Review of Muskrats

Some people call **muskrats** marsh hares or musk beavers. They **are semi-aquatic rodents found along our state's streams, rivers and marshlands**. They get their name from the musky odor they use to attract a mate and from their scaley, rat-like tail. Muskrats have a soft, glossy pelt. They are sometimes trapped, and their pelts are sold for money.

Muskrats are mostly nocturnal, but it is not impossible to see one during the day. Mostly they stay close to their lodges or burrows. Similar to a beaver, but much smaller, muskrats have brownish fur and partially-webbed-hind feet. But their tail is narrow, scaly and flat, not big and wide like a beaver's tail. Muskrats are half the length of a beaver, and they weigh much, much less than a beaver. A beaver may weigh 60 pounds. Most muskrats weigh about three pounds.

Excellent swimmers thanks to their rudder-like tail and unique respiratory system. Muskrats can hold their breath for up to 15 minutes to find food or escape predators like mink, foxes, great-horned owls or hawks. But snapping turtles may prey on them while in the water.

A big pile of plant material that looks like it's floating on a pond or marsh is probably a muskrat lodge. Muskrats build their lodges in autumn in water deep enough to not freeze to the bottom. They enter the lodge underwater, then surface into a dry room inside that sits above water level. Each lodge has several rooms and tunnels. In winter several muskrats may live in one room, huddling together for warmth. At the top of the central room is an air hole that allows in fresh air. **Muskrats are active all winter, even searching for food under ice.**

Muskrats are herbivores. They have big incisors for snipping off plants that they swim back to their lodge, often storing the food for a later meal. Like the beaver, muskrats have special lips that close behind their incisors, allowing them to gnaw on plant foods even while swimming.

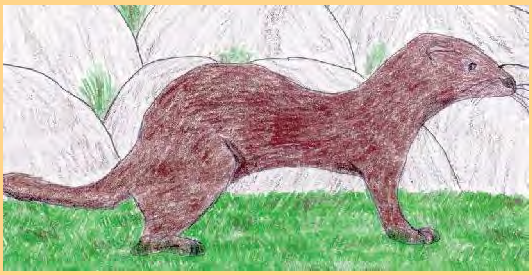
Muskrats produce up to four litters a year. Because they have so many young, some muskrats are out of the lodge and on their own at only two months of age. Because there are so many muskrats, a lot of predators hunt along ponds and marshes.

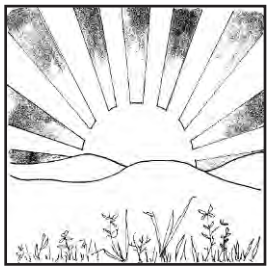
It's pretty easy to spot a muskrat lodge, but it's harder to actually see a muskrat. They might be active on cloudy days. **When they swim, muskrats create a V-shaped ripple in the water**. You can also identify their tracks in the soft mud around a pond. **Look for webbed feet and the mark of a long, skinny tail dragging between the tracks.**

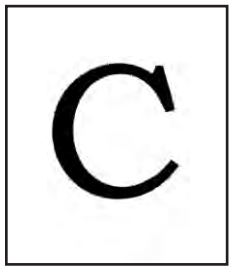
Mink

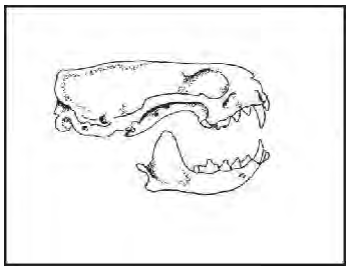
Family Mustelidae

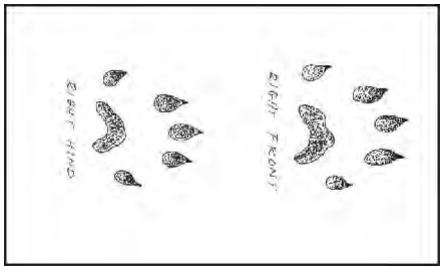
Mustela vison











As the semi-aquatic member of the family Mustelidae, **mink** are usually found near water, especially in forested areas. They are **active year-round** like other mustelids, though they may find shelter and sleep for several days during a winter cold snap. Like most other mustelids, mink are **agile and fierce hunters.** They like to kill their prey with a sharp bite to the back of the skull. Muskrats are by far their favorite prey, along with rodents, rabbits, shrews, fish, reptiles, amphibians. Even birds and their eggs are considered prey. If they happen upon a chicken coop, they can easily raid it. If they kill more than they can eat, they will cache their meal to revisit and feed upon later.

For some people, a **mink coat** is a symbol of luxury, donned on special occasions. Others feel the mink's russet or deep, chocolate brown lustrous coat looks best on the mink itself. Whatever your views, **mink fur has been prized for ages for its warmth and soft texture.** Humans have made their clothing from the skins and furs of animals since prehistoric times. But nowadays, furs that were once considered a necessity have become a controversial fashion statement, especially mink furs.

Like smoking and other fads that have lost their appeal, wearing animal fur as an expensive fashion statement rather than just an essential piece of clothing started to come under attack during the 1960s and 1970s. Those protests marked the origins of the animal rights movement. **Today, over 80 percent of mink in North America are raised on fur farms,** but the mink stole has never regained its former status. **The biggest threat to mink today is habitat loss and water pollution**. Much of their diet is aquatic. Mink suffer when water-borne toxins move through their food chain.

Although mink are still considered **furbearers** and are allowed to be trapped with a license between November and January in Pennsylvania, **their numbers across the state have remained stable and in some areas are growing.**

Mink have an **arch-backed walk or a bounding lope**. Expert swimmers and divers, their **webbed hind feet** help propel them through the water, enabling them to quickly overtake aquatic prey. They are both **nocturnal and crepuscular**, meaning active both at night and dusk and dawn. **Their senses of hearing and sight are superb**. Male adult mink average **two feet in length**, including their eight-inch tail. Their bodies resemble that of the weasel: short legs, long, bushy tail, long neck and body with a short head. Adult males weigh up to 2 pounds; females are lighter and smaller.

Mink are rarely found far from water. Their **preferred habitat** is brushy or rocky cover along the banks of streams, rivers, ponds and lakes. They construct their dens in rockpiles or under tree stumps or in logs. Other times they will just take over a muskrat house. The **dens** can be as deep as three feet underground with several entrances, each near water. Their nesting room within the burrow is often lined with dried leaves, grasses and feathers. Mink share the mustelid habit of softening this chamber with the fur of their prey.

Mink are solitary animals, except during breeding season when a single family may use more than one den. **Breeding season** occurs during late winter and their annual litter is born in April or May. Four to nine kits are born blind and naked, weighing less than an ounce each. They quickly develop a fine coat of white hair which is replaced in a few weeks with darker, reddish-brown pelage. Both adults help raise the kits by bringing prey into the nest.

When the kits need to be moved, the adults carry them by the scruff of their neck on land, but **in water the kits get to ride on the backs of their parents**. By eight weeks of age, the kits are beginning to practice hunting skills by pouncing and stalking along with the adults.

A Simple Review of Mink

They are slinky and cute, but if you were a muskrat you wouldn't think so. That's because a mink is a rather **ferocious predator** and their favorite dinner is muskrat! Like all weasels, they kill their prey with a swift bite to the head.

You might know someone who has a mink coat. A mink coat can be very expensive because mink fur is considered among the silkiest and softest of all mammals. Their dark brownish, red fur is very glossy. Today, wearing a coat made of animal fur isn't as popular as it once was.

Mink need very clean water along forested land in order to be healthy. They den near water, raise their young near water and eat whatever they can catch in the water.

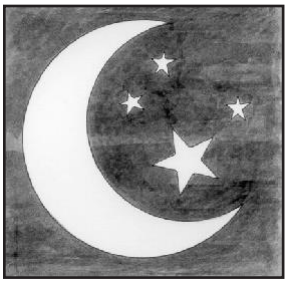
When mink travel, they either walk with a very arched back or make bounding leaps over the ground. It may not seem like that's an easy way to travel, especially with such short legs, but they can easily bound for miles at a time. Mink can be about two feet long, including a long tail.

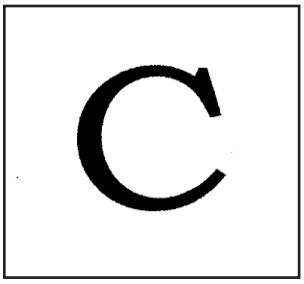
A mink den somewhere near water is used for shelter and raising their kits. Mink also use their den as a kind of refrigerator, keeping the carcasses of their uneaten prey in their underground burrows to save for a later meal. Some mink dens may have dead ducks and muskrats in them. In the chamber where the kits are located, the den is softened with a lining of fur from the mink's prey.

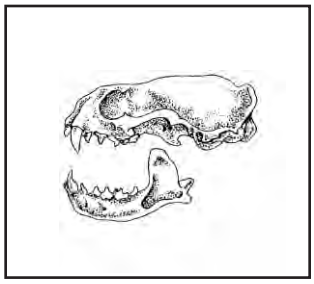
River Otter

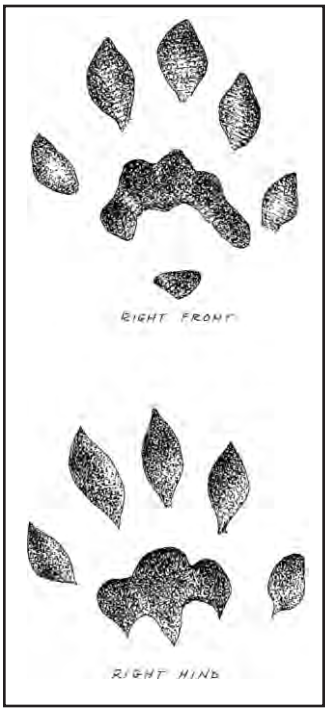
Family Mustelidae

Lutra canadensis









Otters are aquatic mammals that find most of their food in or near water. They love fish, frogs, crayfish, snakes and turtles (and their eggs), worms, insects, and the occasional muskrat. Otters can easily crunch through the shells of snails and mussels. Though they are considered **carnivorous**, they will eat aquatic plants.

Fast, acrobatic swimmers that can propel themselves underwater for up to a quarter-mile and stay submerged up to four minutes without surfacing for air, otters can dive to 50 feet with the help of **valve-like structures that seal their ears and nose to keep out water.** Body flexing in an up and down motion pushes them through water while their feet and tail help them steer.

Otters have **excellent hearing and superb eyesight underwater** and fair eyesight on land. They have a keen sense of smell and long, stiff, sensitive whiskers just behind and below the nose. These whiskers are sense organs to help otters search for food in turbulent or murky water.

Consider yourself lucky if you ever see a river otter in the wilds of Pennsylvania. **Otters are secretive members of the mustelid family** that do not tolerate a lot of human activity. Good otter habitat requires clean water that supports the fish and other aquatic creatures the otters depend upon for their survival. Otters could be **considered a keystone species,** a species whose habitat provides for the needs of many other species besides itself. Lose the keystone species and other species suffer as well.

Otter dens can be found on the edges of lakes, rivers or streams, or on high ground in marshes. Otters may take over an abandoned beaver or muskrat lodge or excavate their own under tree roots or rock piles. Dens have an underwater entrance hole, a living space above the water level and both air holes and escape holes to nearby dry ground.

Otters are sleek, streamlined mustelids, perfect for moving swiftly through water. They are also muscular and solidly built, with short, stocky legs and a long, tapered tail that is covered with fur its entire length. Their face is broad, with small rounded ears and eyes that slightly protrude.

Although only about 10 inches in height, their bodies are over three feet long, with a tail that adds another 12–15 inches to their total length. A mature male otter can weigh up to 25 pounds. Adult females are slightly smaller.

Like minks and beaver, **otters have fur well-suited for aquatic habitats.** The oily underfur is covered by longer guard hairs to form two layers that repel water. Combined with a subcutaneous layer of fat, they are well-insulated against both cold air and water. As added protection against the cold, otter coats grow even thicker in autumn.

Their pelage is a rich dark brown with lighter underparts and a grayish throat and chin. Their nose is black and bare, and their whiskers, as discussed earlier, are stiff and prominent.

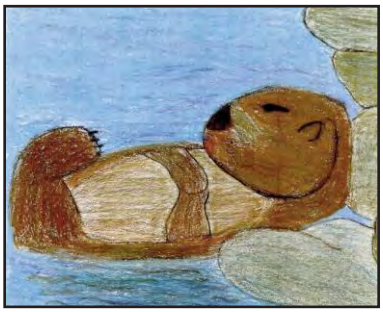
All four feet are wide and webbed between the toes, although the hind pair are larger and provide more propulsion through water than the front pair. They have five clawed toes on each foot.

Even the otter's head shape is designed for a life in water. Their eyes are placed high on the head so when partially submerged an otter can discreetly take a look at what is happening above the surface, much like a frog or an alligator.

Otters have more teeth than any other mustelid in Pennsylvania—36. **They are also the only carnivore in our state with five molars on each side of both the upper and lower jaws**, perfect for crushing shells.

Otters breed in the water between January and May. They too have delayed implantation so the young may not begin to develop in the female until the following December, January or February. So although there is only a two month gestation, the pups may not be born until a year or more after mating has occurred.

One to five pups are born blind and toothless. They do not open their eyes for five weeks, and their mother keeps them in the den until they are three or four months old. Once the pups are ready to emerge from the den, **their mother teaches them to swim.** She will carry or push each pup into the water while she submerges nearby, watching. When the pup tires, she will allow it to climb onto her back. The **swimming lessons are repeated until the pups can enter the water on their own and eventually play, hunt and feed in it.**



A Simple Review of River Otters

Otters are the largest member of the weasel or mustelid family. In Pennsylvania they live along secluded streams, rivers and marshes. They are **sleek, dark brown animals with a long, tapered, muscular body and long, tapered tail.** They have a broad head and small facial features. They are sometimes confused with minks and muskrats, but they are much bigger than either, up to four feet long, including their tail.

Otters are designed for life in the water. They have webbed feet for swimming, special nose and ear flaps that close to keep water out when they swim, and long, stiff whiskers that help them "see" underwater. They like to play. Biologists say their wrestling and playing help them be good hunters. Otters even like to slide down snow and mud banks.

Otters hunt in the water. They are **carnivores** who swim underwater for fish, crayfish and frogs. They'll also eat birds and even aquatic plants. Clean water is very important to otters.

Rare in Pennsylvania, otters once suffered from **strip mine runoff and other toxic waste pollution in our rivers and streams.** Fortunately, today otters are benefiting from our efforts to reduce pollution.

Otters are secretive, so it's difficult to know populations in the state. They are not allowed to be hunted, and since 1980 the PA Game Commission and the Wild Resource Conservation Fund and other partners have been restocking otters throughout the commonwealth.

Continuing these restocking efforts and keeping our rivers and streams clean should really help river otters in our state. Maybe, with a little luck, you will see a family of otters playing by a riverbank soon.

Otters can communicate by making sounds. They can chirp like a bird or grunt when playing or grooming. If they are fighting, they may scream. If you ever surprised one, you might make it snort.

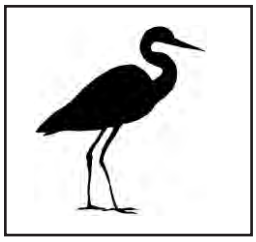
Dens are used to raise 2–4 pups which are born in April or May. Dens could be hollow logs, brush piles, or abandoned beaver lodges. The pups are furry when born, but their eyes are closed for about a month. Pups are weaned at 8–10 weeks when they learn to swim. We know they are excellent swimmers, but did you know otters can stay underwater for up to four minutes? They've been known to dive down as far as 40 feet.

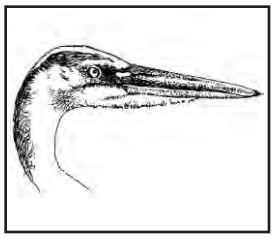
Otters are active all winter and will even swim under the ice of a frozen river or pond in search of food.

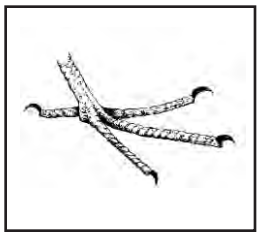
Herons, Egrets & Bitterns

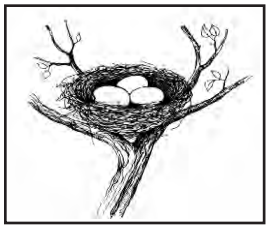
Order Ciconiiformes

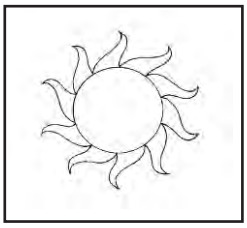
Family Ardeidae











Herons are long-legged, slender birds designed to wade through water. Their long necks and sharp bills help them reach for and grab fish and other aquatic creatures living in shallow waters. Herons swallow their prey whole and then **regurgitate pellets of the meal's indigestible matter** several hours later (similar to birds of prey). The larger herons have impressive **canopy-like wings** that pump slowly in distinctive flight patterns. **Most herons fly with their head and neck held in an "S" shape with their legs trailing out behind them.**

When not walking through water, they can often be seen perched in trees over the water. Their feet are not webbed like other water birds. Instead the **long, flexible toes** help them walk on soft, muddy ground. Their **strong bills** grab their prey though some larger herons have been known to impale their prey. Great blue herons, green-backed herons, great egrets, black-crowned night herons, yellow-crowned night herons, least bitterns and American bitterns all nest in Pennsylvania. The little blue heron is an occasional visitor and both the snowy egret and cattle egret are rare breeders in our state.

Great Blue Heron

Ardea herodius

The Great Blue Heron is **our largest heron, standing over three feet tall** with a wingspan just shy of six feet. They have a blackish crest of feathers on their mostly white head and dark grayish-blue bodies. **Great blues wade slowly through shallow water** while hunting, sometimes making a **canopy of their open wings to shade the water while they fish**. In addition to aquatic prey, they will also take small rodents or insects on land. When disturbed, they release a loud series of squawks as they lift off the ground with slow, deliberate wing beats.

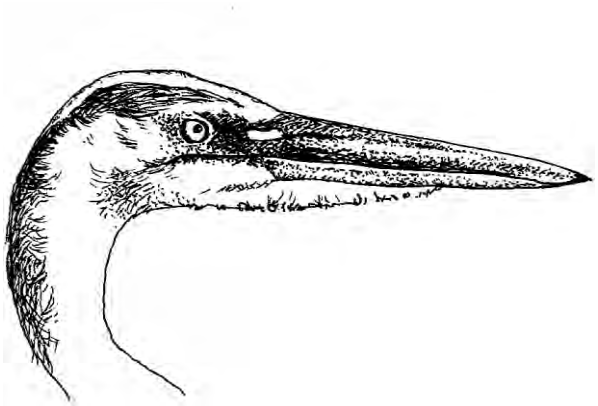
Great blue herons, like most herons, **nest in trees**. Some nest **in large groups called rookeries**, often in mixed flocks. The males build a **nest of sticks** to attract a female. Once she accepts his unfinished nest, she will complete it with twigs the male delivers to her. Usually 3–6 blue, green or brown eggs are incubated by both parents for up to 4 weeks. However, **like birds of prey, incubation begins as soon as the first egg is laid.** This results in young hatching on different days and having **fledglings of various sizes in the same nests**. Adults regurgitate a **liquid diet to the nestlings** until the birds can eat partially digested food and then entire prey like frogs and fish.

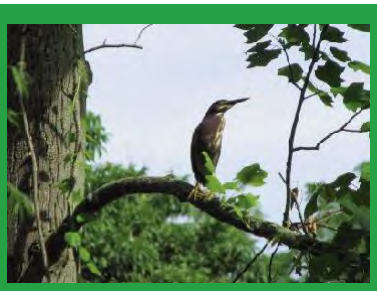
The middle toe of a heron is serrated like a saw edge and helps them preen or groom themselves. Herons also have something called "**powder down**" which helps the birds keep their feathers groomed. Some of their feathers have tips that actually break down into a powder that they spread through their plumage. The **powder helps to absorb and remove the fish oil** and debris from their eating habits.

Great Egret

Ardea alba

The **great egret**, also known as the common or American egret, was **nearly hunted to extinction during the early 1900s for the sake of vanity**. During breeding season these **large white birds grow luxurious, long white plumes that were coveted by the fashion industry,** specifically to decorate women's hats. In time conservation laws were passed to outlaw the use of egret feathers, and the birds have been slowly returning to their former ranges. In addition to a white body, great egrets have a **yellow bill and black legs and feet**. They are our largest white bird in the state, but slightly smaller than the great blue heron.





Green Heron

Butorides virescens

Green-backed herons are much smaller than the common great blues. At little more than a foot long with a two-foot wingspan, these **bluish-green herons inhabit ponds and woodland streams.** They usually hunt in the early morning or late afternoon feeding on fish, frogs, insects or salamanders. These birds also have an unusual fishing behavior indicating they are **one of the few animals to make use of a tool.** They have been seen dropping items like feathers, small branches or even insects into the water from above to act as a fishing lure.

Greens like to **build their flimsy stick nests in trees overhanging the water**. Sometimes you can see eggs through the bottom of the nest if you are standing below it. When disturbed from a perch, green herons fly with a deep wingbeat, releasing a loud squawk as they fly off. They also **have a habit of emptying their waste in a long, white stream** when they launch into flight, so beware when you travel along stream banks where they hunt and live.

Black-crowned Night Heron

Nycticorax nycticorax

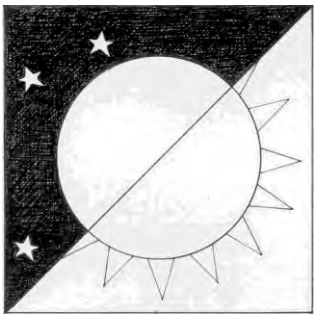
Yellow-crowned Night Heron

Nyctanassa violacea

Both black-crowned and yellow-crowned **night herons are short, bulky herons with thick necks** that are rarely extended. **Both are endangered species in Pennsylvania.** These birds are about 20 inches long with a 44-inch wingspread. **Odd, but attractive, are these red-eyed birds.**

Black-crowneds (top left) have greenish-black backs with pale undersides and orange legs. Their heads are **"crowned" in black with three distinct white plumes attached.** Immature birds are brown-eyed and brown-streaked.

As their name suggests, **night herons are more likely to be active at night when they hunt for fish.** They will even eat dead fish if they come across them, in addition to various other aquatic creatures. Despite being a shy and endangered species, the **black-crowned night heron will nest in busy city parks with a pond or lake**. Many people may be completely unaware these birds have a colonial rookery overlooking their local fishing pond.



Yellow-crowned night herons (top right) are also endangered species in our state and much less common than the black-crowned night heron. **Similar in size to the black-crowned night heron, they have slightly longer legs and a yellow patch on their gray and white heads.**

These gray-bodied birds will hunt during the day or night, seeking out their **favorite meal of crayfish**. These birds are **more secretive** than other herons, behaving more like a bittern. The immature birds (at right) are brown-streaked.

American Bittern

Botaurus lentiginosus

Least Bittern

Ixobrychus exilis

The least bittern (above right) **is our smallest heron** and another of our **endangered species**. Standing up to 14 inches, they have a wingspan of 17 inches. Both their behavior and coloring make them hard to find. Bitterns like to hide by standing motionless whenever they feel threatened. These **narrow, brown-bodied** and heavily streaked birds **"freeze" in place by holding their pointed bills upward** (below left). This allows them to easily blend into the tall aquatic grasses and sedges where they live. Since bitterns are **weak flyers,** this adaptation helps them avoid detection.

Bitterns nest on the ground of wetlands, weaving their nests from dead plant material. **The adults approach their nests indirectly** by landing away from the nest and walking quietly through ground cover back to the nest. **This behavior avoids drawing predators to their eggs or fledglings.**

The **endangered American bittern** (top left) **is the larger of our two bitterns** standing at 1½-feet tall with a 45 inch wingspan.

The **American bittern's** brown **plumage is darkly streaked** and marked with black on the neck and flight feathers. A **shy bird of thick, tall marshland vegetation**, these bitterns are most active at dusk and at night preying on mice, snakes, lizards, frogs and the like. They **hunt by standing motionless until their prey moves by before striking out with their long, pointed bill.** Their solitary nests are mounded on the dry ground within a wetland and made of dried cattails or reeds. During breeding they emit a **croaking call**. American bitterns also "freeze" in place when threatened. As with the least bittern and night-herons, **the fragile status of these birds is closely related to the loss of our marsh and wetlands**, their primary habitats.

While **uncommon**, **all of the following birds can be found on occasion** in Pennsylvania's most southeastern marshes and wetlands and our surrounding states of Maryland, Delaware and southern New Jersey, even though we normally associate them with the flooded grasses of the Everglades in Florida. Both the **little blue heron** (*Egretta caerulea)*–top right–and the **tri-colored heron** (*Egretta tricolor)*–bottom right–are similar in size at about two-feet high.

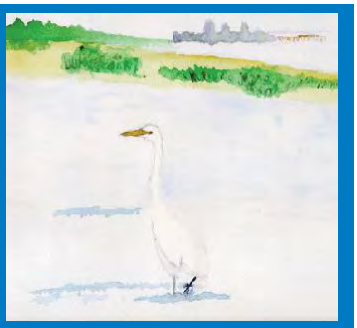
They feed like other herons, though the **tri-colored has a strange habit of spreading its wings and running through shallow water,** perhaps to corral the fish.

The elegant **snowy egret** (*Egretta thula*)–below left–and the **cattle egret** (*Bubulcus ibis*)–below center–are easy to distinguish from the equally white great egret by their much smaller sizes. Both stand a foot or more less than the great egret. The snowy has a black bill and golden feet, while the cattle egret has an orange bill and feet.

Also rare, but sometimes feeding among herons, egrets and bitterns is the exotic-looking **glossy ibis** (*Plegadis falcinellus)*. They belong to the same order as the herons and egrets, but their family is **Threskiornithidae.**

They are medium-sized waders with a **long slender bill curving downward**. Unlike most herons and egrets, ibises fly with their necks stretched out, rather than in an "S" position.

A Simple Review of Herons, Egrets & Bitterns



Herons, egrets and bitterns are all related and **depend on a mostly aquatic habitat** in which to live, hunt and raise their young. Their diets consist of fish, aquatic insects and crustaceans, and sometimes even small mammals, reptiles and amphibians.

Most herons and egrets are slender, long-legged birds with long necks. **When they fly,** their legs often drag behind them while **they hold their neck in an "S" shape**. These birds have canopy-shaped wings that beat slowly and deliberately whenever they fly. The word **"rookery"** can refer to a group of these elegant wading birds or to their colonial nests, which they build together in tree tops near or over water. (below)

Their long, sharp bills help them grab their slippery prey. One heron, the green heron, is even believed to use a tool while hunting. Green herons have been observed dropping small items on the water's surface as bait. When a fish surfaces to inspect the item, the heron grabs it.

These birds are all patient hunters, quietly waiting along the water's edge where aquatic plants like rushes and cattails are growing. Some herons like **black-crowned night herons move their bill through the water to attract prey**. Others like **Louisiana herons will hold their wings open to shade the water.** This either helps them see into the water better or perhaps lure fish into the shade.

Most herons and egrets slowly lift off and fly away from any disturbance, often while emitting a loud squawk. **Bitterns are much more secretive.** If frightened, they hold their head straight up and freeze in place.

That posture, along with their heavily streaked plumage, **helps camouflage them** against the tall thin reeds where they like to hide. Sometimes they even weave from side to side to imitate the movement of the reeds as if a breeze started to blow.

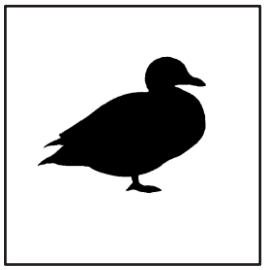
Herons and egrets have elaborate feather plumes around their heads and necks that they develop during mating season. Many years ago those feathers were popular fashion accessories on women's clothing, especially hats. In order to meet the demand, these beautiful birds were killed almost to the point of becoming extinct. Today these birds, along with all migratory birds, are protected by both state and federal law.

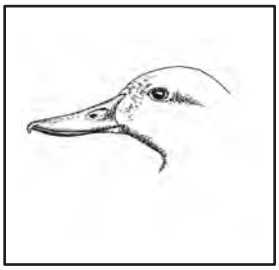
Puddle Ducks

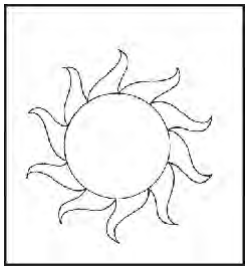
Order Anseriformes

Family Anatinae

Subfamily Anatini







Puddle ducks or dabbling ducks include our most common and recognizable ducks. While the diving ducks frequent large deep bodies of water, the **puddle ducks can be found along shallow shorelines**, ponds, creeks and marshes. Puddle ducks feed mostly on the seeds, grasses, leaves and stems of aquatic plants, but they'll also waddle on land to eat farm crops. True **omnivores**, they will also eat mollusks, insects and fish. The **silhouette of a puddle duck sits higher on the water than diving ducks** and when they want to **take off, they lift directly upward**. Their diving cousins need to run along the water before gaining altitude.

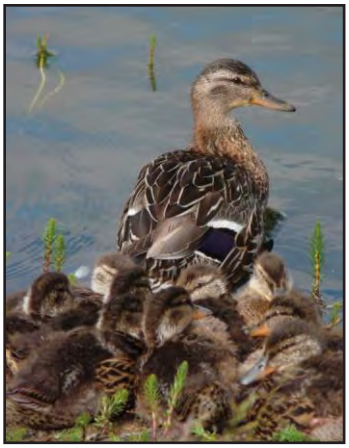
They are excellent swimmers, thanks to their **webbed feet**. On each wing is **an iridescent patch of color called a speculum**. It may serve as a visual ID to help keep the flock together. Varying from species to species, the speculum is an important field mark to bird watchers.

Mallard

Anas platyrhynchos

The **mallard** is perhaps our most recognizable bird and **has the largest breeding range of any bird in the United States.** The **drake** is well-known for his **dark green head, white neck ring and rusty breast.** The buff and brown hen is often seen with a cluster of pale-yellowish ducklings following closely behind her. Both drake and hen have **bright orange bills and orange webbed feet.** The wing **speculum is violet with white borders**.

Mallards are vocal waterfowl, able to swim and fly well. They **eat a variety of foods** including pondweeds, millet, sedges and wild rice, leaves and stems of aquatic plants, insects and crustaceans and even corn and acorns when they wander onto land. Insects make up most of the duckling's diet.



Mallards and other puddle ducks prefer **shallow water for foraging and dense vegetation for nesting**.

After breeding, the drake leaves the hen, doing nothing to help raise the young. The hen alone builds a simple **ground nest of grasses lined with down feathers pulled from her breast.** She will incubate 8–12 greenish-gray eggs.

Within hours of hatching, the hen will lead the ducklings to water to begin feeding. When the drakes leave the hens behind, they seek out quiet areas to **undergo their annual "eclipse" molt, during which they resemble the hens in color.** Because they are flightless while they molt, the drab plumage helps them camouflage from predators, just as it helps the hens stay hidden while incubating her eggs.

Wood Duck

Aix sponsa

Hands down, **our most colorful duck is the wood duck**. The **only cavity nester among our puddle ducks**, "woodies" are smaller than mallards and have a distinct **crest on their heads**. The drake is an iridescent blend of greens, blues, purples and white. He has bright **red eyes, yellow legs and an orange bill.** The hen is a soft, mottled brown with white rings around her eyes.

While most puddle ducks vocalize by quacking, **wood ducks whistle, and shriek,** making shrill warning calls. The **hen is louder than the drake**. Fast fliers, they can **easily maneuver among tree branches in the woodlands where they nest in tree cavities.**

In addition to pulling up aquatic plants to eat, wood ducks will also eat wild grapes, berries, acorns, hickory nuts and beechnuts. **Like all birds that eat whole nuts, the food is crushed into digestible portions within their gizzards.**

Their **courtship involves the drake spreading his iridescent wings, tucking his chin, fanning his tail and holding his crest erect.** He then circles the hen. The hen chooses a **tree cavity,** often abandoned by a pileated woodpecker, **preferring a tall tree over water.**

One egg per day is laid until a clutch of up to 15 eggs is complete. The **eggs are simply placed on wood chips** at the bottom of the cavity **softened by down feathers from the hen's breast**. The drake will stay with the hen while she incubates her eggs but is usually gone by the time the eggs hatch.

About a day after hatching, the hen flies out of the cavity and goes to the ground to begin **softly calling to the precocial hatchlings to join her.** The downy **ducklings will tumble to the ground** generally unharmed (**sometimes from heights of 60'**) and then follow their mother to a nearby lake or stream.

Early last century, the wood duck was almost extinct due to loss of habitat–woodland ponds and mature nesting trees–and overhunting. **Stricter hunting seasons and man-made nesting boxes have helped the wood duck populations rebuild,** as has the state's beaver reintroduction program. Tree-bordered beaver ponds are perfect for wood ducks and where beavers have increased, wood ducks may follow.

Blue-winged Teal

Anas discors

Blue-winged teal drakes are easily recognized by a **large white crescent in front of their eyes.** Their bodies are chestnut brown and their heads are bluish-gray. Both drake and hen have **blue on the forewing and green speculums.** They are **shy, fast flyers** able to quickly dart among tree branches. They are early migrants, leaving as soon as August to southern wintering grounds.

Like all puddle ducks, the male or **drake has bright plumage while the female or hen is drab,** helping to camouflage her against the ground vegetation where most puddle ducks nest. Each **summer after breeding season,** the drakes molt to an "eclipse" plumage resembling the hens until fall.

The **bill of puddle ducks have serrated edges** that allow water to drain out after the duck has pulled up plant foods from underwater. They will also take small fish, frogs and insect larvae, including mosquito larvae.

Most hens lay clutches of up to 13 eggs on grass, leaf and reed nests tucked into thick ground vegetation. A few species nest in tree cavities. **Ducklings are precocial** and covered with pale, dark-striped down to help them camouflage as they closely follow the hen. They can swim and feed themselves soon after hatching but will stay with the hen for several months until they learn to fly.

Green-winged Teal

Anas crecca

Green-winged teals are our smallest ducks, about the size of a pigeon. Drakes have lovely reddish-brown heads with a wide green streak and thin white stripe over each eye. The speculum is green. **Teals are fast flyers that stay in tight flocks**.

Green-wings whistle and call when communicating. **Their wings even make a whistling sound when they fly.** They feed in shallow waters but prefer to be near dense cover for protection. Most of their diet is made up of invertebrates.

Northern Pintail

Anas acuta

The **Northern pintail** is slighter in build than our other puddle ducks but among our most beautifully marked. The **drake has a dark brown head marked by a bold white stripe running up the neck and white breast**. The **speculum is greenish brown**. The **pintail gets its name from its long, pointed tail.** They are fast, agile flyers often **zigzagging as they descend to land.** Their **ground nests** can be found relatively far from water and are **sometimes found in the open**.

American black ducks are sometimes called "black mallards" because they so closely resemble a mallard hen. But their plumage is a bit **darker than mallard hen's, with white underwings and a violet-blue speculum.** Both the **drake and hen black ducks look alike.**

Northern Shoveler

Anas clypeata

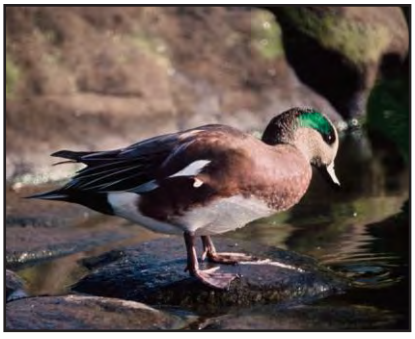
American Black Duck

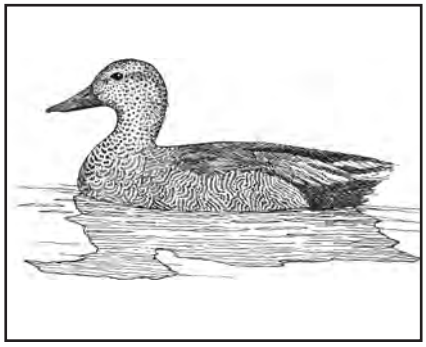
Anas rubripes

Another striking duck is the **Northern shoveler**. Similar in size and color to the mallard, **the shoveler drake has the same green head as the mallard, but his white breast and chestnut sides are reversed**. The best field mark to identify this duck is its l**ong, broad bill**, which it holds downward while swimming. **They like to feed on surface plants, straining them through their bills** as they eat. They are common migrants during spring and fall migration.

American wigeons (below left and center) are sometimes called **"baldpates,"** which refers to the **white patch on the drake's forehead**. There is also a **green area spreading out behind the eye and the speculum is blackish-green**. Wigeons are **easily startled** and will escape threats in compact flocks by twisting and turning in unison. Wigeons migrate through Pennsylvania but nest north into Canada.

Gadwalls (below right) are **subtle brown in color**. While they lack some of the striking plumage of other ducks, gadwalls are **are the only puddle ducks with a white speculum**. Gadwalls are **uncommon in our state** but often congregate in mixed flocks with pintails. Although they are puddle ducks, they **will occasionally dive** for food.





A Simple Review of Puddle Ducks

The two large groups of ducks in Pennsylvania are divided between puddle ducks and diving ducks. **Puddle ducks are sometimes referred to as marsh ducks or dabbling ducks**. Our most common duck, **the mallard, is a puddle duck**. If you can picture a mallard, you have a good idea of the body shape and behavior of most puddle ducks.

Puddle ducks feed in shallow water for aquatic invertebrates and pull up aquatic plants. They **dip their head under water, sometimes upending their bodies with only their tail sticking up**, as they feed. Their flat bills have tiny serrated edges (called lamellae) that strain water, leaving behind small pieces of food.

Ever alert to danger, one member of the flock always has its head up while the others feed with their heads underwater. On land or on the surface of the water, **puddle ducks take off by leaping straight up into the air**. Unlike diving ducks, which have a hard time walking on land, puddle ducks can often be seen **waddling on mudflats or marsh edges**. Some more common ducks can even be found walking along sidewalks or through backyards. Most nest on the ground. But a few, like the wood duck, nest in tree cavities.

Wood ducks often travel quite a distance from water to find a suitable nesting tree. Their nests may be as high as fifty feet up in a tree. Like all ducks, their **chicks are precocial**. This means the chicks are born covered with down. They can also walk and swim soon after birth. In order to get the wood duck nestlings to water, the hen leaves the cavity and softly coos to the ducklings. The ducklings leave the nest by jumping all the way to the ground, sometimes bouncing when they land. They then follow their mother to the nearest water to feed alongside the hen.

A group of ducks floating together **is sometimes called a "raft" of ducks.**

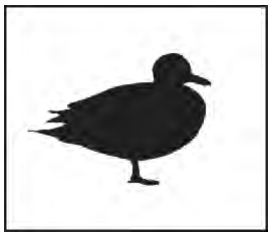
There are many different puddle ducks that live in Pennsylvania or migrate through our state, including the mallard. Male ducks are called **drakes** and females are called **hens**. Most drakes are very colorful, which helps them attract a mate. The hens are browns, blacks and grays. Those shades help them camouflage while incubating their eggs on ground nests. The down-covered nestlings are called ducklings.

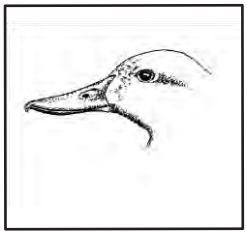
Diving Ducks

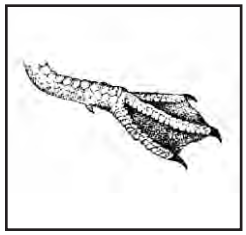
Order Anseriformes

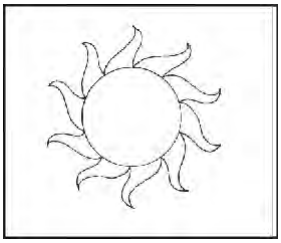
Family Anatinae

Subfamily Aythyini









While the two groups of Pennsylvania ducks can occasionally be seen floating together in rafts, **diving ducks spend more time further from shore than do puddle ducks.** Their preference for deep water requires physical features adapted to underwater feeding since these ducks can dive well below the surface of large lakes and rivers to feed on fish, mollusks, crustaceans, insects and bottom-dwelling aquatics plants. Their **large, broad fully webbed feet** help propel them through water. Their **legs are placed back toward their tail and they have a paddle-like flap on their hind toe.** Both features help them dive efficiently. But **on land, a diving duck is awkward** at best. Their **wings are small compared to their body size**. This, too, helps them dive and swim but makes it more difficult for diving ducks to become airborne. Unlike puddle ducks that can lift directly off the water surface, **diving ducks need to run across the water to build up speed for take-off** (below right).

The **precocial ducklings** are covered with yellow and brown streaks to help camouflage their body outlines as they follow their mother to water soon after hatching. Like puddle ducks, **male diving ducks undergo a post-breeding molt, changing their colorful plumage to resemble the more inconspicuous females.** This helps the males camouflage among vegetation as well as the females since the **males cannot fly during molt.**

Ring-necked Duck

Aythya collaris

Ring-necked ducks have faint **rings around their necks**, but the best field mark to identify these dark-headed ducks is the **white ring around their bills**. Their dark bodies (black males and brown females) are contrasted with white chests.

They are **fast flyers** that **feed in shallow waters more often than other diving ducks.** Ring-necks are common migrants in our state, but they do not breed here.

As with almost all waterfowl, **protecting wetland habitat for their food supply** is crucial for the ring-necks' survival as is **conserving marshland and prairies for their nesting** requirements. Both these particular habitats remain among our most fragile.

What do **cowbirds and redheaded ducks** have in common? **Both will parasitize other bird nests to raise their young**. Redheads lay their eggs in the nests of many other ducks, but they will sometimes lay a clutch of their own.

Even though they are diving ducks, they feed in water that is shallower than most other diving ducks. **Drakes have a beautiful bronze-red head, dark neck and gray body.** Hens are a buffy-brown.

Redheads can sometimes be found during fall and spring migrations in Pennsylvania, but their **numbers have declined due to the loss of the prairie habitats, where they nest** throughout northern North America and Canada.

Canvasbacks are one of our largest ducks, up to 21 inches long. The male has a beautiful rusty-red head, black neck and white body, with an **elongated elegant head profile**. Canvasbacks are **fast birds that can fly up to 70 mph**. They breed on the prairies in the midwest and are considered popular but **uncommon migrants in Pennsylvania**. They concentrate in huge populations in the Chesapeake Bay during winter. Like all waterfowl in our state, **game seasons on these ducks are regulated closely since over-hunting seriously reduced their numbers in the past.**

The **Lesser Scaup**, nearly identical to the **Greater Scaup** (Aythya marila), are also **known as "broadbills" or "bluebills."** Both male and female have blue bills. **Males are black and white, females, brown and white.**

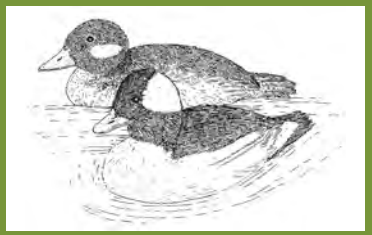
Lesser scaups are **common fall and spring migrants** in our state, while the greater scaup is much less common. These are **true diving ducks, preferring the large open waters of our lakes and rivers**.

Buffleheads are **small diving ducks** weighing about one pound, almost half what most other ducks weigh and only about 13–14 inches in length. The **black and white males** have a **large white patch on their heads**. Females are brown and white and lack the white head patch. They are **common during spring and fall migrations** and are **fast fliers** with very fast wing beats. Buffleheads nest in Canada and Alaska where they raise their brood in **tree cavities,** preferring old flicker nests.

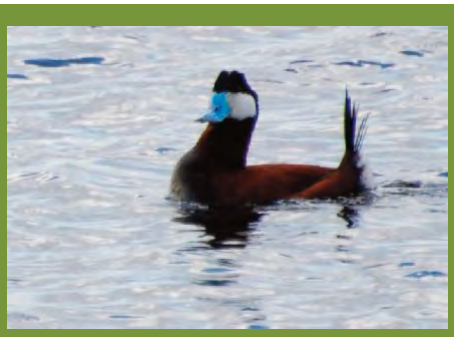
Redhead
Aythya americana

Canvasback
Aythya valisineria

Lesser Scaup
Aythya affinis



Bufflehead
Bucephala albeola



Ruddy Duck

Oxyura jamaicensis

Ruddy ducks are about as **small as buffleheads**. They have a distinct **short, stubby upturned tail**, large **white patches on their face** under a dark cap, and a **blue bill**. **When threatened**, ruddy ducks will **dive underwater** rather than fly away. They fly in tight flocks that skim closely over the water's surface and are **common migrants** in our state.

Other migrants and occasional winter residents to our state are the **common goldeneye** (*Brucephala clangula*) and the **oldsquaw** (*Clangula hyemalis*).

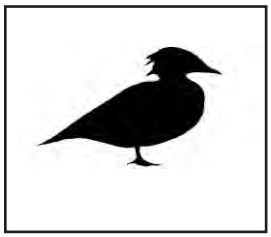
The more **rare species of scoters** (*Melanitta*) are **sea ducks that migrate through Pennsylvania on their way to Canada** and Alaska to breed and then back toward their wintering sites along the Atlantic coast.

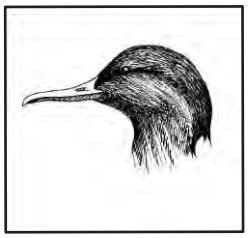
Mergansers

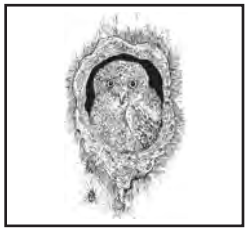
Order Anseriformes

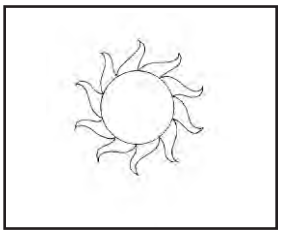
Family Anatinae

Subfamily Mergini







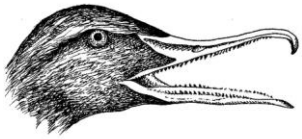


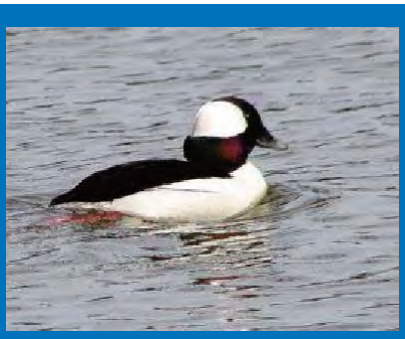
The Mergansers are grouped among the diving ducks but belong to their own subfamily. They are **long, slender-bodied** diving ducks with **long, narrow saw-edged** (or serrated–below, center) **bills**, which help them grip and hold on to fish. Often called "sawbirds," mergansers are known for their **colorful plumage** and habits of **flying fast and close to the water's surface.** Most species have **crests on their heads,** which they can hold up or down at will (top photos and below left). **In flight, their head, bill, body and tail are held in a straight horizontal line**.

Mergansers prey on fish, fish eggs and other aquatic animals. The **hooded merganser** (*Lophodytes cucullatus*)–top right–lives among reeds in Pennsylvania's **swampy, woodland habitats** using a **tree cavity** near a pond, lake, river or stream. They will also use a man-made nesting box placed in the proper habitat.

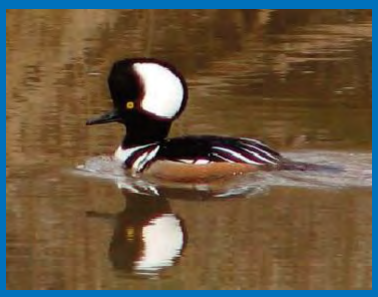
The **common merganser** (*Mergus merganser)*–top left–needs a **wilder, less inhabited** site in order to nest. They, too, are **cavity-nesters but will also nest in a rock pile or even a hole in a stream bank (like a kingfisher).**

Red-breasted merganser (*Mergus serrator)* females build their nests in thick vegetation on the ground, though they nest in Canada and Alaska, not in Pennsylvania. They can be seen on our open rivers during migration. Merganser ducklings from various nests are often grouped together and looked after by a single female.





A Simple Review of Diving Ducks & Mergansers



Diving ducks are a group of ducks that prefer to live on large open bodies of water. They are designed to dive down into deep water in search of small fish and other aquatic creatures. They will also pull up submerged plants for their food. Some diving ducks, like canvasbacks and redheads, prefer fresh water. Other diving ducks, such as buffleheads and oldsquaws, like salt water. Those ducks even have a special gland in the bill to get rid of the salt.

Diving ducks have large webbed feet and **are strong swimmers** as well as divers, but they **do not walk well on land**. That's because their legs are placed well back on their bodies. This helps them dive but makes them awkward on land. Some diving ducks can get stranded on land. One diving duck, the ring-necked duck, deals with this by pretending to be dead if it is grabbed on land by a predator like a fox.

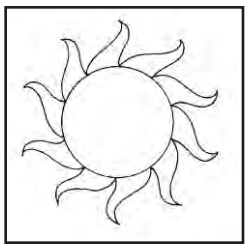
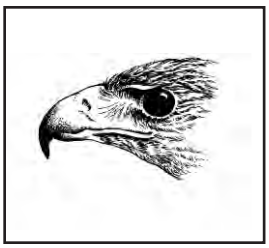
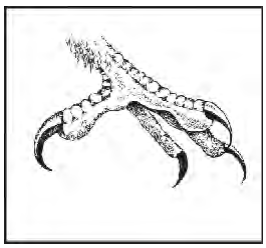
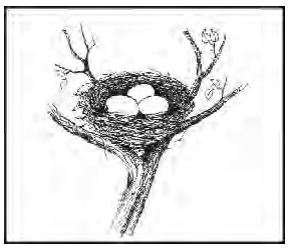
Like all ducks, diving ducks use their bills to strain plant parts and small creatures from water or its muddy bottom. Sometimes they can swallow lead shot left over from a hunting season or pollutants that might be in the water. If the marshes, lakes, rivers and bays where these ducks live are not clean, the ducks can become ill.

When puddle ducks take flight, they lift straight up off the water. But **when diving ducks take off, they need to run across the water's surface before they become airborne.** When diving ducks do fly, they are really fast. Canvasbacks, who get their name from coloring that looks like a piece of canvas, can fly as fast as 70 mph. Ring-necks and goldeneyes make whistling sounds with their wings as they fly overhead.

Mergansers are a group of waterfowl closely related to diving ducks. Mergansers are built long and flat, and they sit low in the water like a raft. They have **long, narrow bills with serrated edges.** Those sharp edges help them hold on to small, slippery fish they catch while diving. Sometimes they are called "sawbills."

Mergansers are beautifully colored birds and excellent swimmers. Before they dive underwater, they **lift the front of their body up out of the water and then arch their body down into the water, rather like a porpoise.** The hooded merganser nests in Pennsylvania and will travel some distance from water to find a suitable tree cavity in which to nest. **While underwater, mergansers propel themselves with both their feet and their wings.**

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.

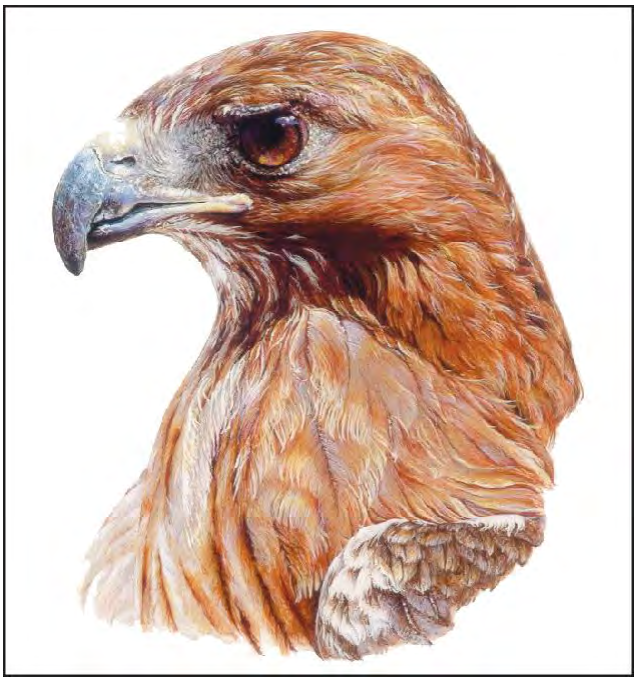
Males and females of most birds of prey are similarly marked and colored, but **females are usually larger than males**.

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

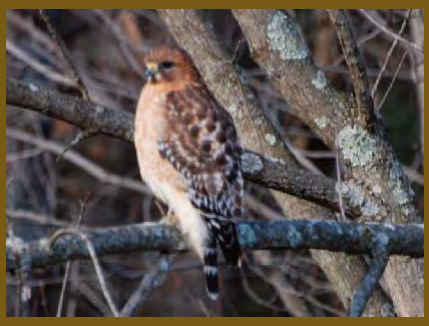
Our most common buteo is the impressive Red-Tailed Hawk. A stocky bird up to two feet long with a wingspan almost five feet, the red-tailed hawk is a common sight along our interstates and country roads perched high on a pole or tree looking for prey in the mowed stretches along the highway. When they 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.

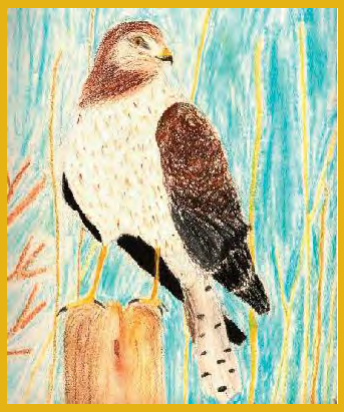
Broad-Winged Hawks *(Buteo platypterus)*–pictured at left–**are also smaller than red-tails.** They, too, are crow-sized, but that doesn't mean they are shaped like a crow. Despite their smaller size, both the red-shouldered and broad-winged hawks retain that very buteo-like body shape: chunky, broad-shouldered 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 lagophus)*–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

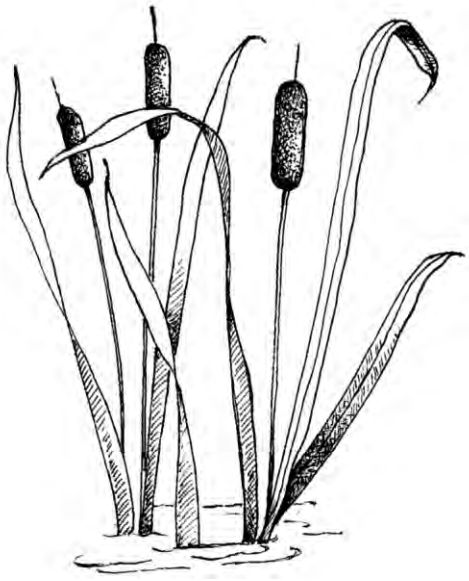
Circus cyaneus

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 patchblack 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.

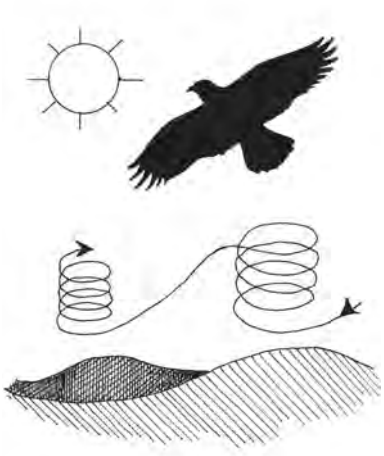
Like all birds of prey, their **eyesight is superb.** This helps them hunt while high up in the sky searching for small prey way down on the ground. Other buteos include rough-legged hawks, which are about the size of a red-tail but only visit our state in the winter. Broad-winged hawks and red-shouldered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

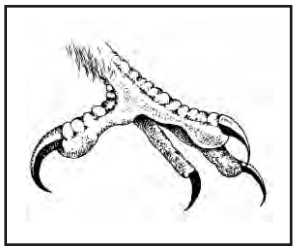
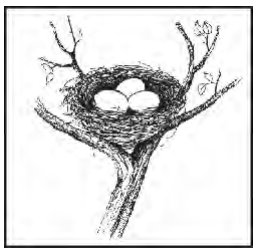
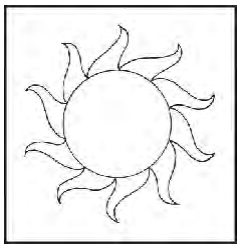
The **Northern Harrier** is also a large hawk, but **is not considered a buteo**. Their body is more slender. The male harrier is brown and the female is gray. This is unusual for birds of prey. Normally, male and female raptors are the same color. **Harriers fly low over the ground while soaring** and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

Eagles

Order Falconiformes
Family Buteoninae

Fortunately **in Pennsylvania it is possible to see both the Bald Eagle and Golden Eagle,** two very large, impressive birds of prey. **The golden eagle is a regular migrant** during fall and spring, but **the bald eagle is making a strong comeback throughout the commonwealth and is found here year-round**. Still, if you spot one of these birds, consider yourself very lucky. They are still uncommon.

Eagles are big. Their wingspan is up to eight feet. When standing they measure about two feet from head to tail and weigh up to fourteen pounds. Compare this to an adult great horned owl, weighing perhaps three pounds. Like all birds of prey, the female is larger than the male.

Bald Eagle

Haliaeetus leucocephalus

Even though **the bald eagle is our national bird**, Benjamin Franklin had wanted the wild turkey to be the symbol of our country, but his wish never came to be. Instead, our nation's emblem is the **magnificent black bird with the spotless white head and tail.** Many people have mistaken the black and white osprey for a bald eagle, until they see a bald eagle. Once you see this huge bird soaring overhead, you will never misidentify the two birds again.

The Bald Eagle is not bald at all. Historically, bald meant white, and when mature, both the male and female bald eagle have white heads and tails contrasting a dark body. The **immature bald eagles** are mottled brown all over their body, sometimes **resembling golden eagles**. At about five years of age, the bald eagle molts into its adult plumage. Both sexes and the immature birds have large yellow beaks and feet.

Never far from water, except when migrating, bald eagles soar on broad wings that they rarely flap. **Their flight silhouette is flat**–imagine two oars sticking straight out at right angles to a canoe. Osprey have a "squashed M" flight silhouette while turkey vultures have "V" or dihedral shape to their silhouettes when flying. **The eagle's call is a coarse *kweek-kik-ik-ikik-ik*** that they scream in flight or when perched.

Almost 90 percent of the bald eagle's diet is fish, although they will occasionally take another bird or mammal. They will also feed on carrion and are not above stealing fish from osprey. They fish from a perch or in flight, using their superb eyesight to spot a fish at the water's surface. As they fly down to the water, they push their feet forward (as if about to land) to prepare to grasp their slippery prey in their talons. They'll hold the food with their feet, using their heavy beak to tear the food into bite- size pieces.

Eagles engage in an impressive aerial breeding display with the birds locking talons, diving and somersaulting through the sky. They will mate for life or until one mate dies. **Huge stick nests called eyries are placed in a large tree** near large lakes, rivers or the ocean. Nests can be as wide as five feet in diameter and two feet deep. Some nests that have been used repeatedly can become so large that the tree branches supporting them collapse.

In early spring the female will lay one to three plain white eggs over several days. **Incubation begins with the first egg**, resulting in chicks of various sizes in the same nest. Both parents feed the young, but if food is scarce the youngest chick may not survive if it has to compete with its larger siblings. By 6 to 7 weeks, the chicks begin to walk around the nest flapping and exercising their wings until they begin to fly at three months.

Due to pesticide toxins that made their way from the farmer's fields into our waterways and into the fish that they ate, **bald eagle populations plummeted in the 1950s and 1960s**. In an effort to re-establish the birds, the **PA Game Commission began removing eaglets from nests in Canada and then raising and releasing them in our state through a hacking program.** Hacking refers to caring for a young bird in a semi-wild condition until it can fend for itself. It worked, and now there are dozens of bald eagle nests in the state. Although **recently downgraded from endangered status to threatened, bald eagles** still require our protection.

Bald eagles may live up to 30 years or longer, but since they don't begin to breed until about five years of age, **their reproductive rate is slow**. A slow reproductive rate means it is difficult to build population up if anything threatens it.

Eagles are not normally preyed upon by other animals, **but people have wreaked havoc on their populations**. Some eagles are shot illegally, and some are electrocuted when landing on power lines. Due to the bald eagle's close relationship with water, toxic pollutants have had the largest impact on our national bird.

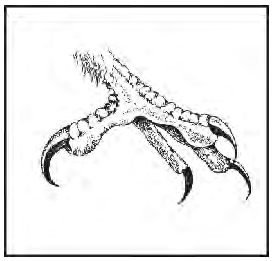
Golden Eagle

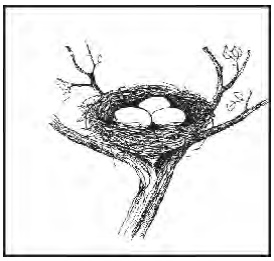
Aquila chrysaetos

Golden Eagles are associated more with the Western United States than Pennsylvania, but during spring and fall migration, especially during October, **it is possible to see these enormous golden-brown birds soaring overhead.** They do not nest in the state or spend any other time here.

Because immature bald eagles resemble both the immature and adult golden eagles, golden eagle sightings seem to be more common than they actually are. **Their dark plumage is highlighted with a golden sheen,** especially on the head and neck with considerable white mottling throughout the body.

Goldens are strong, intelligent birds. In their resident territories out west, goldens have been known to knock mountain goats and sheep off steep ledges in order to kill them. The eagles will then fly to the base of a canyon to feed on their prey wherever it landed. They hunt over open range taking rodents, hares, birds, reptiles, in addition to larger prey.





DIURNAL - Active during the day

Osprey

Order Falconiformes
Family Pandionidae

The Osprey *(Pandion haliaetus)* is not as large as an eagle, but it is still an **impressive bird of prey with striking field marks.** Any large black and white hawk-like bird seen near large lakes or rivers in the state should be considered an osprey unless you can be sure you are not looking at a bald eagle.

Osprey are black above and white below with a **white head marked by black cheek patches**. In flight their "wrists" are black against the white underside and **their flight silhouette has a distinct crook** (or squashed "M") in the wings.

Superb fishers, **osprey hover** high above the water before dropping to the water to grab a fish with their talons, sometimes submerging momentarily to grasp their prey. **Unique scales on their feet** help them hold the struggling fish while they fly back to a perch or their nest, turning the fish face-forward to reduce wind resistance.

Osprey don't soar as well as other birds of prey. **Their flight resembles a sea gull's slow wing beats.** The wingspan is up to 6 feet and they stand 20–24 inches from head to tail, but are noticeably thinner than eagles and perch in a slightly horizontal position, giving the impression they are about to take off.

Osprey calls are high-pitched whistles. Their nests can be seen on treetops, utility poles, billboards, channel buoys and other high structures, natural or man-made. They are quite tolerant of human activity but will duck down in the nest when there is too much commotion.

The stick nests are loose, bulky and lined with bark or grasses. Some nests, which are used year after year, are decorated with seashells or pieces of fish nets. The female lays an average of three white or pinkish eggs with brown spots.

A Simple Review of Eagles & Osprey

Bald eagles and osprey are both large, hawk-like birds found near large bodies of water. Many people mistake the osprey for a bald eagle, but **eagles are much, much larger than ospreys.** If you saw the two birds next to one another, you would not mistake them.

The **adult bald eagle** has a dark brown body and full **white head and tail**. The **osprey has a white body** with dark wings and black marks on its face.

Bald eagles do not get their white head and tail until they are about 4–5 years old. They are not bald. Many years ago the word **bald meant white**. For the first few years of their lives, bald eagles are a mottled brown and white all over. They have a **large, strong yellow bill**, and **yellow legs and feet.** The **osprey has a black bill**.

An eagle's feet and talons would be about the same size as an adult human's hand and fingers. They are big birds. **Bald eagles eat fish** most of the time. Sometimes they steal fish from ospreys hunting in the same area. Eagles **will also eat carrion** or injured small animals.

Like all birds of prey, **bald eagles have broad, flat wings**, which allow them to soar for hours on thermals. When eagles soar, they hold their wings flat. **Osprey hold their wings in a squashed "M" silhouette.**

The **bald eagle** holds a special place among wildlife because it **has been our national bird since the late 1700's**. Despite that title, until recently bald eagles have been on the **endangered species** list. Many years ago their numbers dropped to dangerous levels because they were sickened by toxins in the fish they ate. They have also suffered from loss of habitat. Happily their populations are growing. Bald eagles can be seen fishing and nesting on most large rivers in Pennsylvania.

Golden eagles do not nest in our state, but they do pass through the state during fall and spring migration. They, too, are **very large, dark birds**. Sometimes a golden eagle can be mistaken for an immature bald eagle, but golden eagles have **golden-brown feathers on the back of their head and nape.** Unlike the bald eagle, **their legs are completely feathered**. Golden eagles never have a white head or tail.

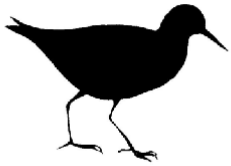
They soar in lazy circles, but **in a dive they have been clocked at 120 mph.** They are strong hunters, taking mammals and birds by attacking from above. Golden eagles have been known to take an animal the size of a small deer.

Osprey are beautifully marked raptors with dark brown body parts set against bright white. They **have small, white heads with a dark crown, eyestripe and dark bill.** They have **gray legs and feet**. Fish make up most of their diet.

The soles of their feet have barbed pads that help them grip the slippery fish they grasp from near the surface of the water. **In flight they will turn the fish around so the fish is facing head-first** in the direction the osprey is headed. This is believed to make flying easier.

The outer **toes of the osprey's feet are even reversible** to help them grab a fish easier. Depending on need, they can hold a fish with two toes forward and two toes backward or one toe backward and three toes forward.

Osprey love to nest on top of posts and platforms near large bays, rivers or the ocean. Their **stick nests** are large, but not as large as bald eagle nests which can weigh as much as two tons!



A Simple Review of Sandpipers

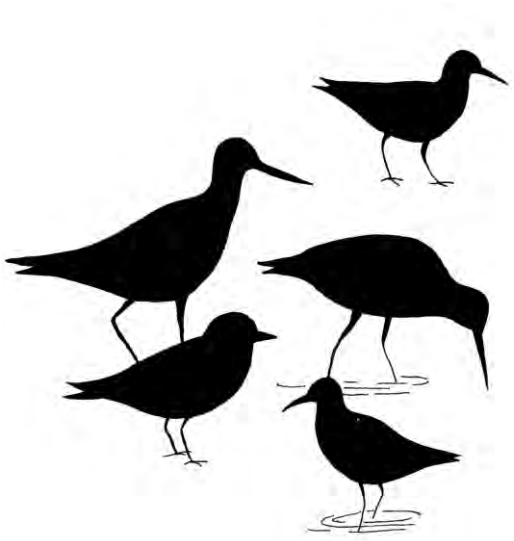
The **order of birds called charadriiformes includes some familiar shorebirds** like sandpipers and plovers. Woodcocks and snipes also belong to this order, even though some people assume those gamebirds are more closely related to birds like pheasants and turkeys.

Pennsylvania is not known for its shorelines, at least not the shorelines you associate with the ocean. But we have many large rivers in the state and our northwest corner borders Lake Erie. **Any muddy or sandy edge of a body of water can be considered a shoreline, and that's where you find most shorebirds.**

Our **most common shorebird is the spotted sandpiper.** They are easy to identify. When they walk along the water's edge **they teeter up and down,** sort of like the slow bobbing motion of a sewing machine. Even the chicks teeter soon after they hatch. The **precocial chicks** follow their mother as she feeds, quickly learning how to search for food in the muddy soil and which tiny insects and crustaceans to eat. If they are frightened, the bobbing gets faster. But if the birds stop, they stay motionless. No one seems to know why the spotted sandpiper behaves this way.

One of our sandpipers, the **upland sandpiper, is a threatened species**. They are much taller than a spotted sandpiper, which is about robin-sized. The upland sandpiper is longer-legged and stands about a foot tall. They also **prefer grassy areas and will nest in fields and meadows**.

Many other sandpipers pass through the state during spring and fall migration. Any time you are near a lake or river edge, it is worth scanning the shoreline for a glimpse of some of these attractive birds.



Different types of sandpipers practice feeding behavior known as **"resource partitioning."** This means they can live and feed together without a lot of competition.

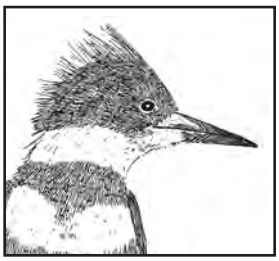
Some shorebirds have long legs and some have short legs; some have long bills and some have short bills. When they feed together, the long-legged, long-billed birds can wade further into the water and find small creatures deeper in the soil because of their physical features.

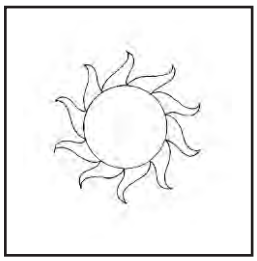
The short-legged, short-billed birds feed beside them, finding small creatures in the shallower water and closer to the soil's surface. Many other kinds of birds practice resource partitioning, too.

Belted Kingfisher

Order Coraciiformes
Family Alccedinidae

Ceryle alcyon





Easily identified by an **unusual body-shape, loud rattling call and distinct fishing technique**, the **belted kingfisher's body is short and stocky.** Their unusually large head is topped with a **ragged crest**. Their black beak is large and pointed, while their tail and feet are relatively small compared to their overall size.

The kingfisher has lovely blue plumage highlighted by a white breast and a ring of white around the neck. The female also has a **belt of rusty feathers along her breast and sides**. The belt gives this kingfisher its name, despite the fact that **male kingfishers lack this fieldmark**. Kingfishers can be up to 14 inches in length and are found in aquatic habitats throughout the state.

Hunting from perches like overhanging branches, pilings, utility wires or bridges, kingfishers hover over the water while searching for fish below. They will **dive into the water with their eyes closed** and grab their prey with their strong bill. **When returning to their perch with food, they smack it against their perch to stun it** and then eat the fish headfirst. Kingfishers will eat whatever kind of fish they can catch up to about 5 inches in length. They will also occasionally eat small birds or mammals, insects, mollusks, reptiles or amphibians, especially after rain has muddied their hunting waters.

Like birds of prey and some herons, **kingfishers regurgitate a pellet of indigestible matter** (bones, fish scales, fur, etc.) sometime after feeding. Most of their feeding occurs in the morning.

If you flush a kingfisher from its streamside perch, you will be scolded with a **crackling rattle.** The call is **used both as an alarm and for territorial clashes.**

Mated pairs call to one another more softly. Both defend their territory while raising their young. **During courtship the male will feed the female, and they often engage in acrobatic flights close to the water's surface.**

Kingfishers have unusual nesting behavior. Both males and females **dig a burrow several yards into a steep bank above a body of water** or in sand and gravel pits. The burrows are usually several feet below the top of the bank, rarely more than a mile from water.

The nest tunnel slopes upward and is three to four inches in diameter, ending in a nesting cavity about the size and shape of a watermelon. **Whenever the adult is about to fly into the tunnel, it sounds a call from a nearby perch and then dives down into the tunnel.** The only signs of activity will be toe marks at the entrance to the nest.

The female lays five to eight white eggs on the floor of the cavity. After about 24 days the eggs hatch. The **chicks are altricial**–depending entirely on **their parents to feed them regurgitated fish** until they are able to handle whole fish–delivered to them in the cavity as often as every 20 minutes during the day. The chicks cover their waste by scratching soil from the tunnel. This helps to reduce any odor that may attract predators. Within a month, the chicks are enticed out of the tunnel by their parents perched nearby with fish in their bills. It will take another three weeks or more for the parents to teach the young how to fish and find other food. As they grow and learn to care for themselves, **young kingfishers escape danger by diving into the water.**

A Simple Review of Belted Kingfishers

Kingfishers are oddly-shaped, but attractive birds. They have a **feathered crest on their head, a white collar, and large, black bill**. Males have a blue band across the chest, while the female has a blue and a orange band across her chest. Kingfishers are one of the few bird species that have a female more colorful than the male.

If you've ever heard a belted kingfisher call as it flies along a stream, you won't be surprised to learn that a group of these birds is called a "rattle" of kingfishers. Their **cackling call does sound like a large rattle.**

Kingfishers feed mostly on fish. They hover over streams, rivers, lakes and bays searching for food before diving into the water to catch their prey.

Once they catch a fish they will find a branch to perch on, **sometimes smacking the fish against the branch to kill it.**

Believe it or not, kingfishers **build a nest by burrowing into a dirt bank** (at right). Sometimes they even share their nesting tunnels with small birds like bank swallows. They are considered **colonial nesters.** That means they will often nest in a colony with other kingfishers. When they approach their nest they will swoop down to enter the tunnel, leaving just a feather mark or some toe scratches on the loose dirt surrounding the tunnel entrance.

Larger birds, like hawks, might try to catch and eat a kingfisher. **When they feel threatened, the kingfisher will dive underwater to escape danger.**