



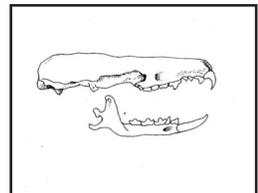
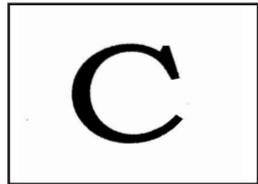
Shrews & Moles: Order Insectivora



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

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

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

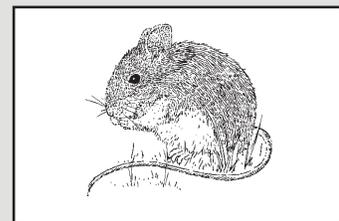
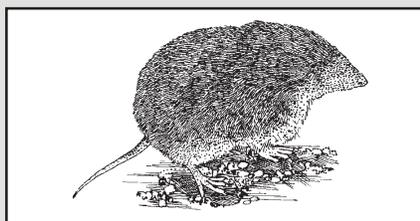
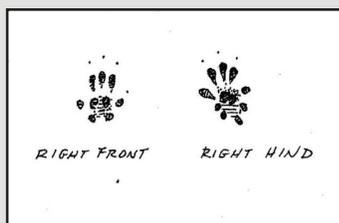


Shrews have a very high metabolic rates and, like many small birds, must eat almost continuously. Despite their minute size, shrews are pretty tenacious and often go after prey larger than themselves. The **short-tailed shrew even has venomous saliva.** It is a rare example of toxicity in mammals.

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

So is that a Shrew or a Mouse?

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



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

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

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

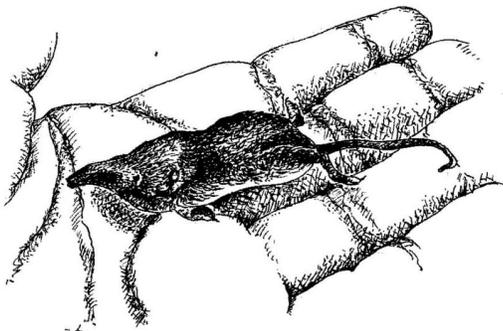
The **Smoky Shrew** (*Sorex fumeus*) occurs in most of Pennsylvania except in the southwestern and southeastern counties where it would be considered less common due to lack of suitable habitat. Similar to the masked shrew, but larger and darker, these shrews love shady, wet woodlands with lots of deep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

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



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

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



Pygmy Shrews (*Sorex hoyi*) are also uncommon

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

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

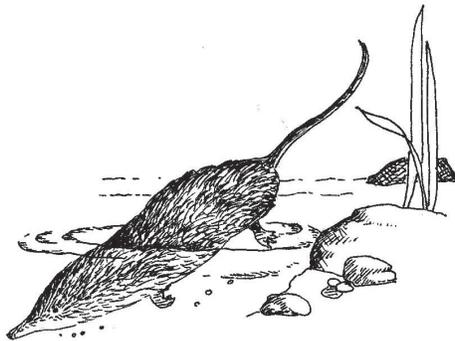
Short-tailed shrews can be found just about anywhere there is topsoil, and leaf litter to forage through. They also burrow through the snow in winter. Active day and night, **short-tails might eat small snakes, mice, even small songbirds if they get a hold of one.** Like all shrews, they are considered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

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

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

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

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



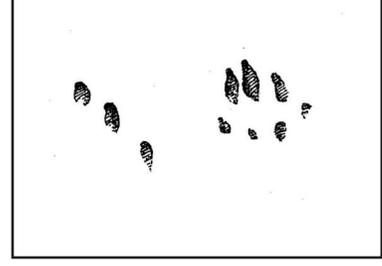
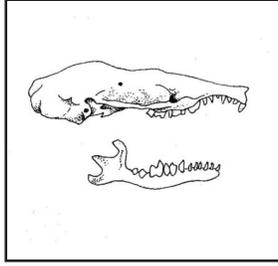
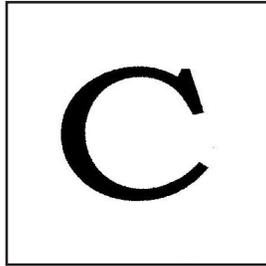
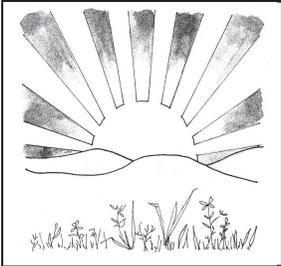
Water Shrews (*Sorex palustris*), found across Pennsylvania in heavily wooded areas, are **uncommon and mostly nocturnal.** Well-adapted to a semi-aquatic life, they live along mountain streams and bogs under bank overhangs, fallen logs or brushpiles. In winter they may move into a beaver lodge or muskrat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

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

Moles belong to the Family Talpidae



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



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

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

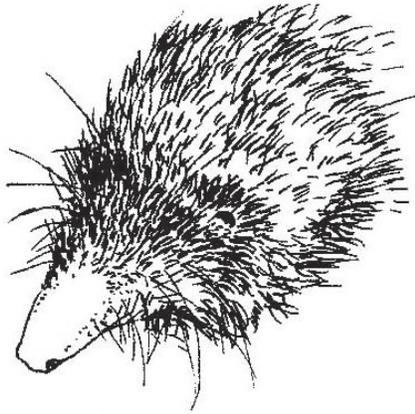


Hairy-tailed Moles (*Parascalops breweri*) are smaller than our other moles and have a short, hairy tail. They thrive in loam soils under both meadows and forests. They don't like wet habitats. Like shrews, they **spend most of their day eating up to three times their body weight**. They'll eat insects,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

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

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

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



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

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

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

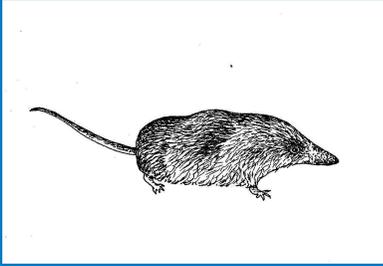
Star-nosed Moles (*Condylura cristata*) (right) are easily identified by the unusual starfish-like appendages around their nose. What do you do with a nose like that? Those unusual whiskers help them feel for prey and star-nosed moles have an excellent sense of touch.

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

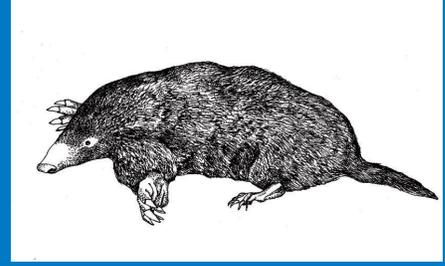
Their diet relates to a semi-aquatic life: feeding on aquatic invertebrates such as caddisfly larvae. In winter they forage under the ice in frozen lakes and ponds for food. The star-nosed mole has the second most teeth (44) of all North American mammals. Only the opossum has more (50).

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





A Simple Review of Shrews & Moles

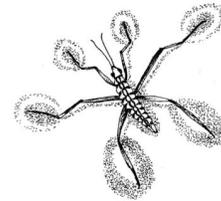


Shrews (above left) & Moles (above right) both belong to the **Order Insectivora**. This means they feed mostly on insects. Even though they are often confused with rodents, shrews & moles have lots of tiny, sharp teeth for biting and killing their prey. Rodents have chisel-shaped front teeth for gnawing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

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

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

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



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

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

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