



Figure VI-3



Figure VI-2



Figure VI-1, A yellow stripe accents the lower sides of the queen snake.

Figure VI-2, By the time ferns cover the forest floor, the timber rattlesnake has left this winter den for more open areas.

Figure VI-3, A timber rattlesnake peers from the shelter of a burned out stump on a warm autumn day.

Figure VI-4, The eastern smooth green snake can easily become lost among tall grasses.

Figure VI-5, The northern ringneck snake wears a golden or yellowish necklace around its neck.

Chapter VI SNAKES

Order Squamata
Suborder Serpentes



Figure VI-4



Chapter VI—The Snakes

Mention the word “snake,” and many people cringe, shudder, scream, run or all of the above. Snakes could be the most maligned, misunderstood, feared and hated animals known to man. Almost from the beginning of mankind (engravings of snakes were found on crafted antlers dating back to 8,000 B.C. to 15,000 B.C.), snakes have been a source of mystery, myth, folklore, fascination and fear. From the ancient story of Adam and Eve in the Garden of Eden to the present day, snakes have been considered fascinating—but a doer of dirty deeds. To ancient Hebrews, these serpents were the personification of evil, and early biblical references portrayed snakes as the sin-offering Satan.

Still, snakes have been popular symbols for countless centuries. The ancient Greeks believed that snakes had supernatural healing power, and even today the medical profession is symbolized by two snakes coiled around a winged staff. Called a Caduceus, the snake-encrusted staff originally was carried as a symbol of authority by Mercury, the messenger god of Roman mythology.

The elaborate headdresses worn by the pharaohs of Egypt were embedded with the likeness of snakes. The ancient rulers were convinced that snakes were a source of power and protection from harm.

Even colonists in the early days of this nation emblazoned a rattlesnake on their first flag and on several others afterward. With the words “Don’t Tread On Me,” the rattlesnake (with 13 rattle segments, one for each colony) graphically and boldly portrayed the determination of a fledgling country to become independent. In a letter that appeared in *Bradford’s Journal* of December 27, 1775, it was written that “ancients regarded the serpent as an emblem of wisdom, and . . . of endless duration.” It went on to note that “the rattlesnake is found in no other quarter of the globe than America, and it may therefore have been chosen on that account to represent . . . the Revolutionary armies.”

Regardless, many people continue to regard snakes only as a menace and a symbol of repulsiveness and evil. There are some who believe that the fear and hatred most people feel toward snakes is not inherent, but is taught, handed down from generation to generation. True, some date back to ancient biblical references. But what young Cub Scout, about to leave for his first-ever outing, hasn’t been admonished by mother as he goes out the door, “watch out for snakes.” And even as we get older, one angler might caution another about to embark on a fishing trip into a not-so-remote wilderness area to “be careful of the snakes in there.” We’re faced, it seems, with constant reinforcement that snakes—all snakes—are something to be feared.

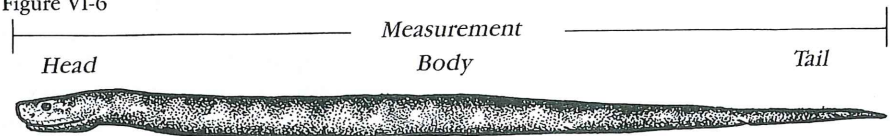
Through a better understanding of these reptiles, fears can be overcome, mysteries unraveled and hatred diminished. Armed with more knowledge, all of us can respect these animals for the important part they play in helping keep nature in check. There’s no question that care should be exercised when in the presence of poisonous snakes—they can be harmful. But given their due respect and the understanding that their venom sometimes is used as a means of defending themselves and in obtaining prey, even these snakes in most cases can be left to go their own way. They, like all animals, should be allowed to fulfill the mission nature intended for them as an integral component within a complex ecosystem.

There are some 2,700 snakes known in the world today. Snakes inhabit

all the continents except Antarctica. There are 11 families of snakes in all, five of which have representative species in the United States. In Pennsylvania, two families appear, with 16 genera accounting for 21 species; only three of these are poisonous.

Ancestors of today's snakes apparently evolved from lizards. It's believed lizards went underground where they escaped the huge appetites of the dinosaurs. Though safe from monstrous predators, over eons of time these lizards lost their limbs, hearing and to some degree their eyesight. Perhaps confined to close quarters, snouts became narrower and that meant smaller, non-chewing teeth. As they became more slender, internal organs also underwent changes resulting in a less efficient heart and the loss of one lung. The result of these changes, which occurred over countless years, is the snake much as we know it today.

Figure VI-6

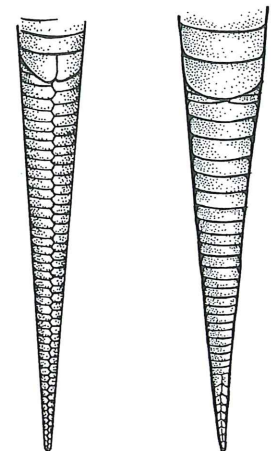


Snakes are generally described as long and slender (See Figure VI-6), perhaps elongated is a better term, and without limbs (although some species still have hidden vestiges of legs not completely lost during their evolution from lizards). Snakes do not have movable eyelids and there are no external ear openings. Their bodies are covered with scales that differ somewhat between species. Some scales are smooth (completely flat) while others have a ridge that extends down the center of the scale and are said to be keeled (See Figure I-10). The scales are dry and help prevent dehydration. They also aid in protecting the snake from physical injury. The type of scales, whether they are smooth or keeled, can help sort out one snake from another. The anal plate, a scale located near the vent, may be divided into two segments or appear as a single scale. This, too, can help identify certain snakes (See Figure VI-7). The scales on the underside of the tail help distinguish our pit vipers, which have a single row of scales, from our non-poisonous snakes which have two rows of scales (See Figure VI-7).

Snakes have a highly developed sense of balance, a trait especially helpful to those snakes considered arboreal. While some may spend a majority of their time in trees, other terrestrial species seldom, if ever, leave the ground. Still others are considered at least semi-aquatic and spend a certain amount of time in the water. Some of these reptiles are nocturnal. Others are considered diurnal and crawl about during the day. All are carnivorous and swallow their prey whole.

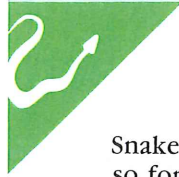
Figure VI-7

Underside of Snake Tail



Divided anal plate
Scales in two rows

Single anal plate
Scales in one row



Snakes do not feed on plants or plant parts, so grains, seeds, vegetables and so forth are never touched.

Snakes may mate anytime from spring to fall. The male locates the female by scent, and during breeding fertilization is accomplished internally.

Among our snakes, egg laying is probably the most common means of reproduction, although some species retain the eggs or young snakes inside the body during the embryo stage. In this case the snakes are born alive (See Figure VI-8).



Figure VI-8

A young black racer gets its first look at the outside world.

There are several advantages to keeping the young inside the mother during the development stage. Protection from predators is better ensured and atmospheric fluctuations that could cause eggs to dehydrate or rot are minimized. Development is also enhanced because

the mother can better regulate the temperature of the embryo by avoiding extremes of heat or cold, moving from one area to another as necessary to ensure proper and speedy growth of the expected progeny. The eggs, which remain inside the female, lack a calcified shell and in fact are more a sac-like membrane.

In most cases after the young are born, or the eggs are laid, the parent snake departs immediately and the juveniles are left to fend for themselves. Fortunately, young snakes are self-sufficient from the very beginning and can manage quite well without their parents. In some cases, a quantity of unused egg yolk may remain in the body. Thus, the young snake has an internal source of nourishment to carry it over until it is able to forage for itself.

Some snakes, usually the smaller species, feed on worms, insects and other small prey. Larger snakes feed on rodents, fish, frogs, birds and a variety of mammals. Different species of snakes employ different methods in obtaining and swallowing food. The smaller snakes simply grab the prey with their teeth and swallow it live. Others snatch their prey with their teeth and constrict it until it dies from suffocation. Still others have adapted poisons to kill their prey before eating it.

All snakes have numerous teeth, but in most cases they are designed only for grasping and holding. The teeth have not been developed for chewing, so the snake is unable to carve its food into bite-sized pieces before eating it. Thus, it is forced to swallow its prey whole. This process has fascinated people for ages because the prey sometimes exceeds the diameter of the snake. But again, nature has constructed a jaw that permits this reptile to engulf prey many times larger than itself.

The lower jaw is not solidly fused in front but is held together instead by an elastic ligament that allows the jaw to part. This jaw is only loosely connected to the skull. The upper jaw is immovable, but the bones to which the upper teeth are attached can be moved slightly. With the prey held firmly in the mouth by many sharp, rear-pointed teeth, either side of the lower jaw can be loosened, which enables the head to move forward, up and around the prey, a small step at a time. The mouth now opens in a wide gape, each side works alternately and independently of the other and by so doing pulls or "walks" the food into the mouth (See Figure VI-9). As the food is forced into the back of the mouth, the throat expands because of a



loose assemblage of head bones, and the food enters the throat. At this point, powerful muscles work the food into the stomach where strong digestive juices take over, even to the extent of absorbing bones. The skin is extremely elastic, and when distended, allows prey to be taken into the stomach where a large bulge



Figure VI-9

A specially adapted jaw allows snakes to swallow their prey without chewing.

shows that the snake has just enjoyed a meal. A movable windpipe, which extends from the throat to the end of the lower jaw, permits the snake to swallow large prey and breathe at the same time.

A snake's skin does not grow as the body matures and becomes larger. Therefore, the skin must be shed, a process called ecdysis. Snakes may shed for the first time only a few days after being born or hatched. As they age, shedding may occur from four to six times a year at first, slowing to only once or twice a year after they reach maturity.

As the shedding process begins, the snake's general coloration becomes dull and the eyes become cloudy as a molting fluid fills the space between the old and the new skin. This may occur 10 days to three weeks before the actual shedding takes place, and the snake may be partially blind during a portion of this process. As the skin becomes slack, it is first worked loose at the chin and snout as the snake rubs against a solid object. With the skin on the head loosened, muscular contractions take over and the snake slips out of the skin, turning it "inside out" in the process.

Snakes have no eardrums or external ear openings. They apparently were lost during the evolutionary process. Even though they are unable to hear as can most other animals by sensing air-borne vibrations, snakes are sensitive to contact vibrations and in that sense have a well-developed sense of "hearing." A bone called the columella, transmits vibrations from the lower jaw into the inner ear embedded in the side of the skull. It's an effective method. Approaching footsteps are easily detected and the snake often escapes long before it might be seen by the approaching intruder.

Several snake myths and folklore have been fabricated on the "unblinking stare" of these serpents, that their steady gaze has caused their prey—and perhaps even humans—to become hypnotized. Although snakes do not hypnotize, it is true that they do not blink. They can't blink. They are not equipped with movable eyelids. Instead, the cornea is covered and protected by a transparent eyecap that actually is a fixed, circular scale shed and renewed along with the rest of the skin and scale covering. This eyecap, called the brille, is an important protective device and prevents injury when the snake burrows, swims through the water or slithers quickly through dense vegetation.

Although its eyesight is keen and sensitive to movement over a wide range, distant vision is not so well-defined because it lacks a refined method of focusing.

The tongue seen darting quickly in and out of the mouths of snakes also has been a source of myth and tall tales. It is not a needle-like projection and cannot be used to penetrate the skin of prey, a nearby foe or humans. It is not capable of injecting venom or any other toxic substance. It is, in fact, harmless.

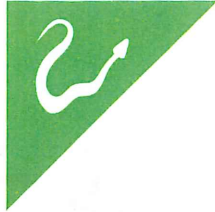
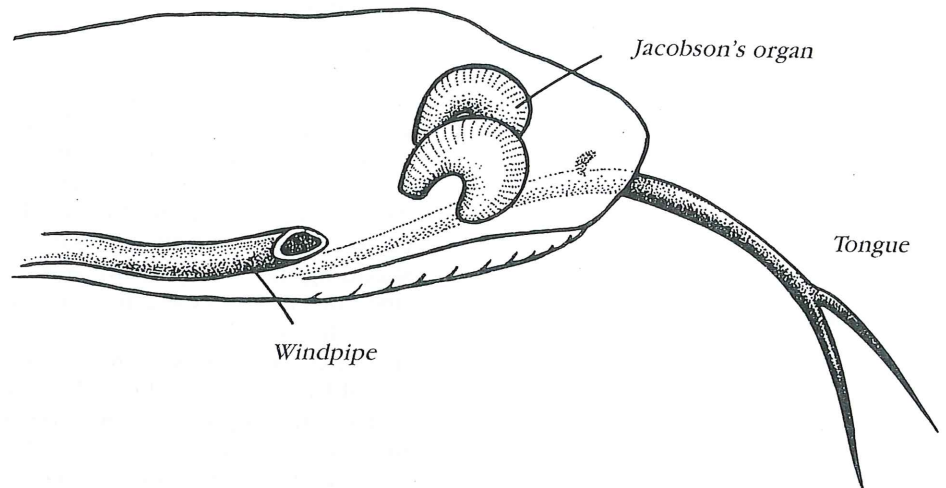


Figure VI-10

Jacobson's Organ and Tongue



The tongue is moist and quite delicate, and it's an important part of an extremely sensitive system used for tasting and smelling. (Some lizards and salamanders have similar systems.) Though the snake's sense of taste is not highly developed, the ability to smell (although perhaps not in the same sense as humans) is excellent.

The tongue is forked and can dart in and out of the mouth through a notch in the upper jaw even when the mouth is closed. When extended, the tongue picks up microscopic particles from the air and brings them into the mouth. Here, the double-tipped tongue quickly places the samples into two small cavities embedded in the palate at the rear of the mouth. The cavities lead to a chemical receptor called the Jacobson's organ (See Figure VI-10). The Jacobson's organ contains sensory cells able to identify chemical particles and transmits these sensations of taste-smell to the brain.

When not collecting chemical information, the tongue is withdrawn into a narrow sheath on the floor of the mouth located just in front of the breathing tube. When disturbed or in some other way its interest is aroused, the snake's tongue moves rapidly and frequently between the Jacobson's organ and the air outside. With this well-developed sense of "smell" the snake detects the presence of enemies, finds food and locates its mate.



How Does a Snake Get from Here to There?

In spite of having lost its limbs as it developed over millions of years, the snake as we know it today in Pennsylvania is able to move about efficiently and when needed, quickly. Several methods or a combination of means can be used.

The most important body structure allowing snakes to be as mobile as they are, is the very large number of vertebrae in the spine, or backbone. Counted in the hundreds, each vertebra is attached to a pair of ribs curving downward and around the body. The ribs in turn are attached with muscle to large scales, or scutes, on the belly. These scales and the ribs are important if a snake is to be able to move quickly and effectively through its surroundings.

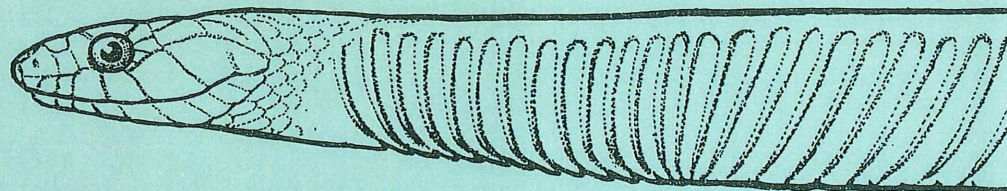
When not in any hurry, a snake uses a caterpillar-like movement called rectilinear locomotion (See Figure VI-11a). This method of locomotion allows the snake to move in a straight line. To do so, the scutes (those belly scales) move in groups, alternately gripping and advancing; not all the scales on the belly move at the same time or in unison. Instead, several scutes in a group grip the surface over which the snake is moving and push forward, while the next group of scales is picked up slightly and

moved forward. The second group of scales then grips the surface as a third group advances to be laid down in preparation to provide the grip, and so on. The effect is similar to the familiar method used by a caterpillar.

When the snake needs to move more rapidly, it uses another, more effective method, called serpentine locomotion. In this case, a series of writhing undulations is used in which the sides of the body are pushed against some solid object such as a tree, stone or even the rough surface of the ground. The unmoving objects provide a hold or push-point for each rib as it passes (See Figure VI-11b). As the snake moves, it alternately contracts and relaxes the muscles attached to the vertebrae, first one side, then the other. The result is a bending of the body into a series of S-curves (See Figure VI-12), providing pressure points on the back side of each body curve. As the curved body pushes against the stable object, the snake is propelled forward in a wavelike motion. It is thought that the scutes are also used to help pull the body forward while gripping the surface.

By using either the rectilinear or serpentine method of locomotion—or a combination of the two—snakes can negotiate nearly any surface and move about almost anywhere.

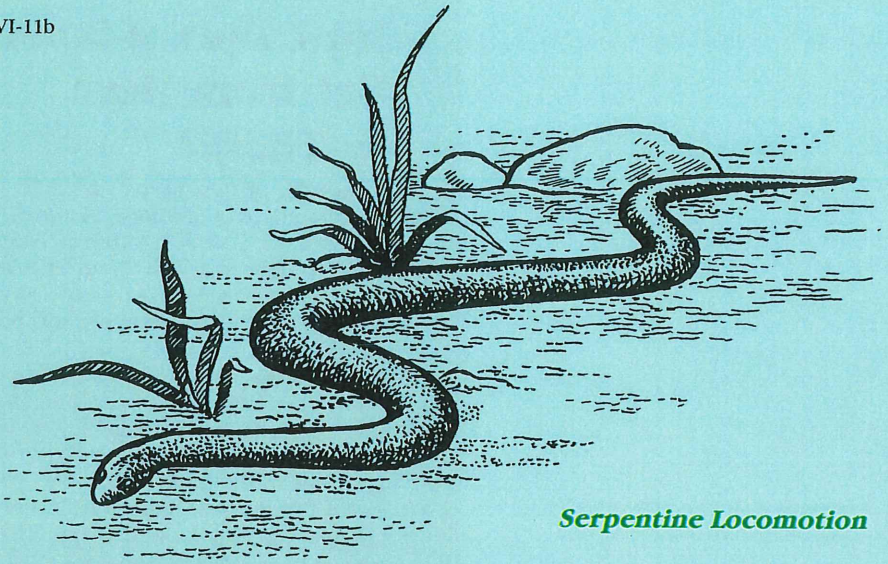
Figure VI-11a



Rectilinear Locomotion



Figure VI-11b



Serpentine Locomotion

Figure VI-12



Snakes use pressure points at the rear of each body curve to propel themselves forward.



The liquid movement of snakes has been a source of wonder and amazement for many people over countless years. To become mobile, snakes have developed a specialized and effective bone-muscle-scale construction.

One of the most important elements in the enhancement of this reptile's locomotion was the growth of a large number of very small vertebrae. Some species have as many as 400 of these miniature spinal bones, which allow the snake's fluid movement and flexibility. Except for the tail, these vertebrae have a pair of ribs attached to them. Muscles in turn connect the ribs to large belly scales, called scutes. The scutes are able to grip the surface over which the snake is moving, enabling it to travel over a variety of terrain and climb trees.

The ribs and scutes do not all move together as the snake propels itself forward. As scales on one part of the belly move forward, others are just beginning to move backward, to be picked up and placed in a forward position once more. The scales, as they move back and forth, grip the surface and produce a caterpillar-like movement, pulling the snake along at a leisurely pace with the body in a straight line. The pace is silent and slow, ideal for stalking prey.

However, when the snake is disturbed or wants to move quickly it uses a series of undulations in an accordion-like form of locomotion. By drawing the body into several S-curves, successive sides of the body are pushed against solid objects such as rocks, plants or the rough ground. This serpentine effect is produced with alternate contractions and relaxations of the muscles on each side of the body. Relaxing the muscles and ribs attached to one side of the vertebrae while contracting the opposite allows the body to flex or bend. This S-shaped wriggling continues in a wave-like pattern as the curves alternately form and straighten out. This "curve-push-straighten-out" series of movements can be performed rapidly and it quickly propels the reptile forward.

Colubrid snakes (Family Colubridae)

Eastern worm snake—*Carphophis amoenus amoenus*

Kirtland's snake—*Clonophis Kirtlandii*

Northern black racer snake—*Coluber constrictor constrictor*

Northern ringneck snake—*Diadophis punctatus edwardsii*

Black rat snake—*Elaphe obsoleta obsoleta*

Eastern hognose snake—*Heterodon platyrhinos*

Eastern kingsnake—*Lampropeltis getulus getulus*

Eastern milk snake—*Lampropeltis triangulum triangulum*

Northern water snake—*Nerodia sipedon sipedon*

Rough green snake—*Opheodrys aestivus*

Eastern smooth green snake—*Opheodrys vernalis vernalis*

Queen snake—*Regina septemvittata*

Northern brown snake—*Storeria dekayi dekayi*

Northern redbelly snake—*Storeria occipitomaculata occipitomaculata*



Shorthead garter snake—*Thamnophis brachystoma*

Ribbon snake—*Thamnophis sauritus*

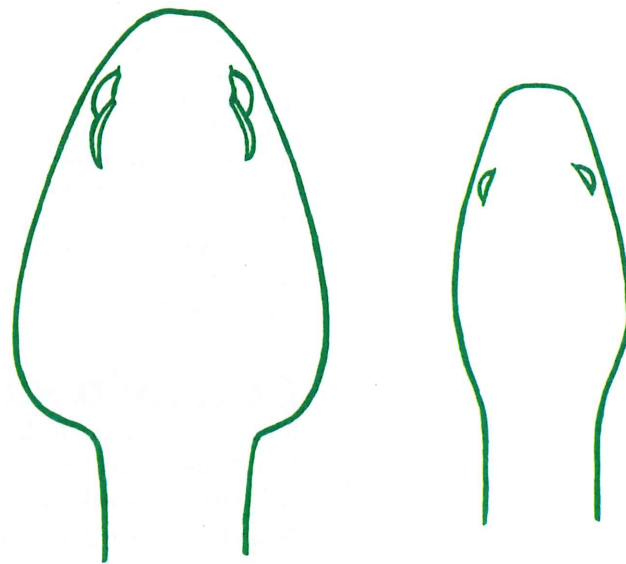
Eastern garter snake—*Thamnophis sirtalis sirtalis*

Earth snake—*Virginia valeriae*

The colubrid family is the largest of all the snake families and contains all of Pennsylvania's non-poisonous species. Three-fourths of the world's 2,700 snakes belong to this family. There are 18 species from this family in Pennsylvania, representing 13 genera. The colubrid family includes arboreal snakes, and others that seldom, if ever, leave the ground. The state's water snakes are also included in this family.

Figure VI-13

Shape of Heads of Pennsylvania's Snakes

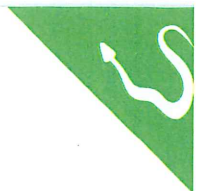


Poisonous

Non-poisonous

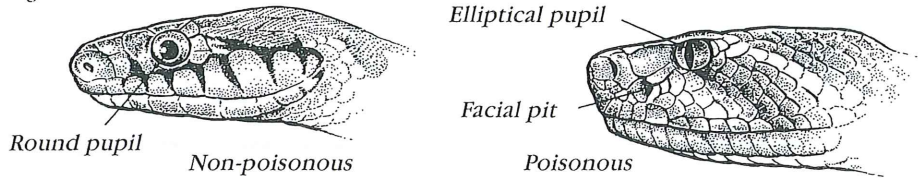
Generally, these snakes all have a head that is tubular to somewhat flattened. The head is normally as wide as the neck (See Figure VI-13), perhaps a bit more so in some species. The pupils of the eyes are round in Pennsylvania species (See Figure VI-14). The head is covered with large scales arranged in a regular pattern. The scales across the back may be either smooth or keeled and can help in identifying several of the species (See Figure I-10). There are two rows of scales on the underside of the tail (See Figure VI-7). There are teeth on the upper and lower jaws, but these snakes do not have the enlarged hollow fangs common to the poisonous varieties.

The colubrid snakes feed on a variety of vertebrate and invertebrate animals. They devour their prey whole. No vegetation is used in the diet of these snakes.



Facial Pit and Pupils of the Eyes of Pennsylvania's Snakes

Figure VI-14



Pit Vipers

(Family Viperidae; subfamily Crotalinae)

Northern copperhead—*Agkistrodon contortrix mokasen*

Timber rattlesnake—*Crotalus horridus*

Eastern massauga—*Sistrurus catenatus catenatus*

Pennsylvania has three poisonous snakes. All are members of the pit viper subfamily Crotalinae of the family Viperidae and all its species are poisonous. Most are stout-bodied snakes with a head that is well-defined from the neck (See Figure VI-13). Their pupils are vertically elliptical, shaped like a cat's pupil (See Figure VI-14). Most members of this family are nocturnal and bear live young. They are considered the most advanced of the snakes.

These snakes are equipped with long, hollow fangs that actually are modified teeth located near the front of the upper jaw. Their normal position is folded back along the jaw where they connect to a movable bone but swing forward rapidly when the mouth is opened in preparation to strike. Except for its tip, each fang is encased in a fleshy sheath. While only one set of functional fangs is in place, several others may be in various stages of development with replacement occurring every few weeks.

Each of these large, hollow teeth is connected by a duct running from the base of the fang to a gland located on the side of the head, behind the inner ear (See Figure VI-15). The snake usually strikes from a defensive S-curve posture. It is lightning-quick as the body straightens. The snake can strike a distance of about one-third to one-half its body length. Young snakes can strike, inflict a wound and inject venom as

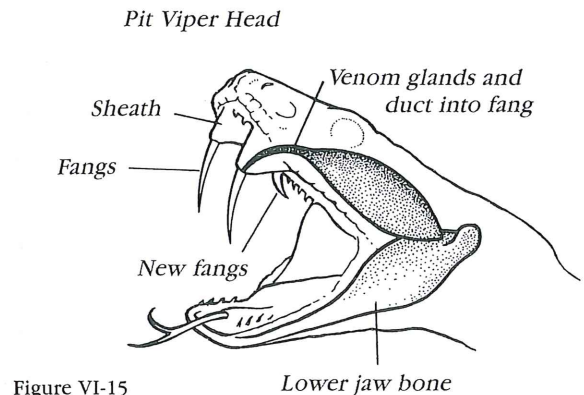
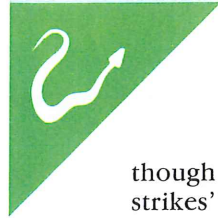


Figure VI-15

soon as they are born. The venom of Pennsylvania's poisonous snakes is a complex mixture of proteins primarily affecting elements of the circulatory system. Tissues are destroyed by the venom and the blood's ability to clot properly is affected. Victims also find that the body's ability to fight off infection is lowered. The venom may also contain some neurotoxin, thus potentially inflicting damage to the nervous system.

Prompt medical treatment should be sought in the event of a bite. However, these snakes are able to withhold the venom if they desire, even



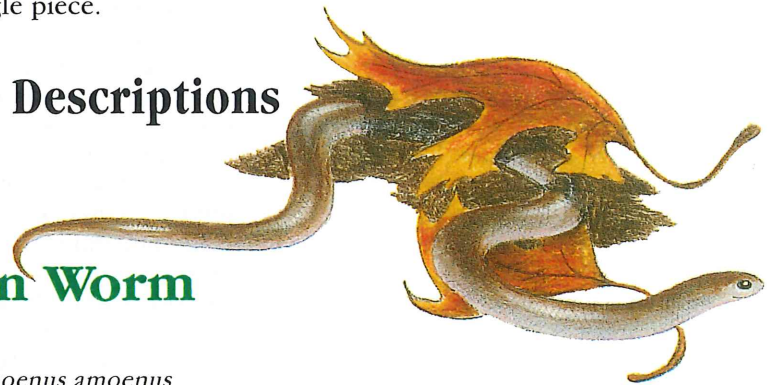
though the fangs may have been used to inflict a bite. So-called “dry strikes” are known to occur.

Pennsylvania’s three poisonous species are pit vipers, so named for the deep pit located on each side of the head between the eye and the nostril (See Figure VI-14). These depressions are heat-sensitive organs able to respond to very small changes in temperature. Always alert, the organs respond to the amount of heat reaching them and help the snake detect the existence and locate the direction of a warm body. It is especially helpful at night when lying in wait for prey, because it allows the snake to locate warmblooded prey in complete darkness. Using this heat receptor, the snake locates prey that comes its way and strikes with great accuracy.

Like other snakes, pit vipers must shed their skin as they grow. In the case of the rattlesnakes, this also means adding a new segment to the rattle. A new segment is added each time the skin is shed, which could occur several times a year depending on the age of the snake. Thus, counting the number of segments on the rattle does not reveal the true age of the snake. A newborn rattlesnake has a pre-button on the end of its blunted tail. The first button is not gained until the young rattlesnake sheds its skin for the first time. The scales on the underside of the tail are in a single row (See Figure VI-7).

These snakes, like the others, are carnivorous and must consume their prey in a single piece.

Species Descriptions



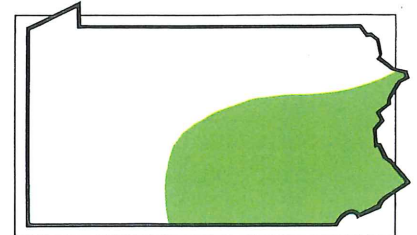
Eastern Worm Snake

Carphophis amoenus amoenus

General characteristics. It’s easy to understand how the eastern worm snake got its name. It resembles an earthworm and isn’t much larger when you consider that adults reach only seven to 11 inches. It is one of the smallest snakes in Pennsylvania. The worm snake is a secretive animal, rarely seen in the open. If you wanted to locate a worm snake, you would have to do some serious searching.

Identification. This snake is tiny and glossy in appearance. Except for the belly, which is a bright reddish pink, the eastern worm snake is brown and unpatterned over its entire body. The head is blunt and rounded and the tail is short with a sharp tip. The scales of the eastern worm snake are smooth and contained in 13 rows. The anal plate is divided.

Range. Range. This small reptile ranges from lower New England to South Carolina and Alabama. The known distribu-



tion of the eastern worm snake in Pennsylvania is limited to the southeast quadrant, covering about one-fourth of the state. It has not been confirmed as inhabiting areas north of the lower Poconos nor west of the Allegheny Mountains.

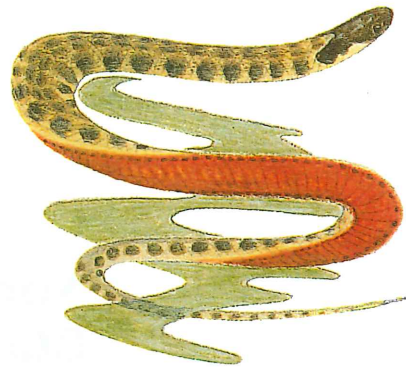
Habitat. Damp, often hilly woodlands are home to the eastern worm snake. It is partial to wooded or grassy hills above streams or moist ground. The eastern worm snake takes temporary shelter under rocks and decaying logs or retreats into the loose soil of its environment. During dry spells and during periods of cold weather, the eastern worm snake burrows deep into the soil.

Reproduction. The tiny eastern worm snake mates during April and May, depositing one to eight eggs in June or July. Elongated and thin-shelled, the eggs measure less than an inch. The eggs hatch in seven weeks and the emerging young eastern worm snakes are three or four inches long. Darker than the adults, they mature in three years.

Food. The eastern worm snake feeds on worms and soft-bodied insects. Its habitat normally produces sufficient food of the type preferred, so it feeds well before going into winter hibernation. Not without problems, however, the eastern worm snake is in turn preyed on by the milk snake.

Kirtland's Snake

Clonophis kirtlandii



General characteristics. This snake is one of three water snakes in Pennsylvania, but it is found only in limited numbers and considered very rare. It was named for Jared P. Kirtland, an Ohio physician/naturalist. It is the smallest of the state's water snakes, attaining adult sizes of 14 to 18 inches. Kirtland's snake reacts in much the same manner as other water snakes when alarmed, except its reaction is more pronounced. When frightened, the defense mechanism is suddenly and swiftly to flatten their bodies to the ground. Kirtland's ability to perform this feat is more developed than other water snakes, becoming almost ribbon-like in the process.

Identification. Kirtland's snake is a slender reptile with background colors ranging from brown to reddish brown or gray. The back is accented with two rows of alternating dark, squarish spots that run the length of the body. The belly is reddish and bordered along each side with a line of round, black spots. The latter is a good identifying characteristic, helping sort this snake from others that might have similar markings or reddish underparts. The scales are keeled and the anal plate is divided.

Range. In Pennsylvania, Kirtland's snake is limited to the western portion of the state, roughly following the western slope of the Allegheny Mountains. From here it ranges west through Ohio into Michigan and Illinois and

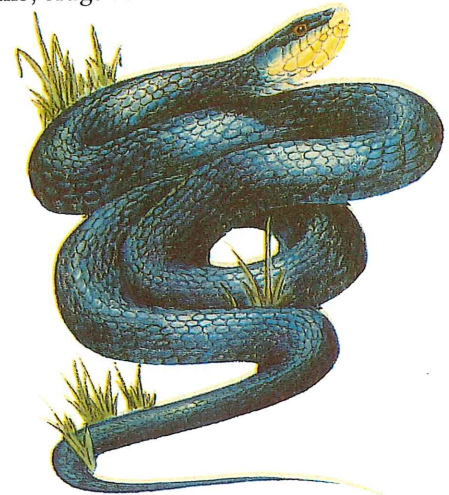
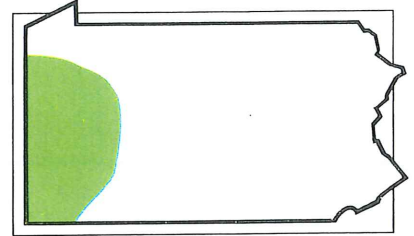


south to Kentucky. It does not extend into Erie County. It is an Endangered Species of special concern.

Habitat. Unlike many water snakes that thrive in or close to a near-total aquatic environment, this water snake prefers to remain near marshy meadows, swamps or woodland ponds. It would not be unusual to find it tucked under a piece of sandstone or other flat stone in a marshy meadow. Although it swims well, Kirtland's snake is the least aquatic of the water snakes.

Reproduction. Young are born in early August to late September. It does not lay eggs, giving birth instead to live young measuring five to 6½ inches long. The size of the litter varies from four to 22. When born, the belly is a deep red, becoming somewhat subdued as the snake matures.

Food. The diet of Kirtland's snake is limited to what it can find in watery or at least moist surroundings. Worms, slugs and some small fish are the main staples.



Northern Black Racer

Coluber constrictor constrictor

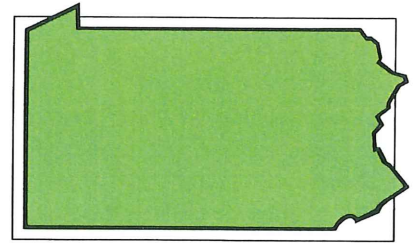
General characteristics. The northern black racer is often referred to as the "black snake" and is second only to the black rat snake in size. It can attain an adult size measuring three to five feet in length. The northern black racer is diurnal, which means that it is most active during the day.

In spite of its scientific name, the black racer is not a constrictor. In fact, it is among several species of snakes considered non-constricting. If picked up, however, it does have a tendency to bite, sometimes repeatedly, and is apt to thrash about violently. The unusual habit of rapidly vibrating its tail against dry leaves has probably startled a hiker or two. One's first reaction to the buzzing sound produced as the tail strikes the crisp surface of the leaves is "rattlesnake." If nothing else, this false alarm heightens the senses of the trail walker. Although usually quick to flee, the black racer can become a fierce fighter when cornered or somehow made to feel trapped. Left to itself, it is harmless.

Identification. The black racer grows to become quite long but retains a slender appearance. It is fast, able to cover a lot of ground in a short time,

and it is an agile climber. The northern black racer is slate black above and below, with an almost satiny luster. There is usually a small patch of white on the chin and throat. When born, the young racer is gray and marked with dark spots on the sides and with dark gray, brown or reddish-brown blotches streaming down the middle of the back. This pattern becomes less distinct as the snake grows, and by its third summer it has taken on the shiny single color of the adult. By then it is probably 30 inches long. The scales on the northern black racer are smooth and can be compared to the keeled scales of the black rat snake. The anal plate is divided. The head is narrow and the eyes show the yellow lens common to diurnal snakes.

Range. This long reptile can be found from Maine to Georgia and Alabama. It extends as far west as Tennessee. The northern black racer is a fairly common snake and is distributed statewide in Pennsylvania.



Habitat. This snake is at home in a variety of habitats. It can be found in abandoned fields, grassland, open woods or on wooded hills strewn with rocks. Anglers might see it moving silently along the grassy banks of a stream. The racer spends most of its time on the ground, but it is a good climber, retreating to the branches of a serviceberry or other small tree or shrub. Open areas that are fairly dry appeal to the black racer when it is time to bask in the sun. Dens for hibernating often are found on a rocky hillside and sometimes are shared with other species of snakes.

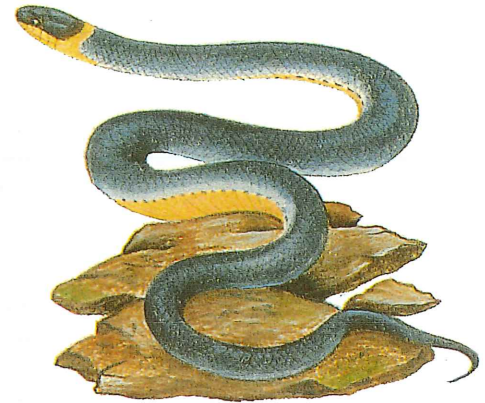
Reproduction. The northern black racer begins looking for a mate in April to late May, and by mid-June to August the female deposits from five to nearly 30 eggs in a rotting tree stump or sawdust pile. Sometimes the female might find a tunnel burrowed into the soil by a groundhog or other mammal in which to lay her eggs. The eggs are white and leathery to the touch with a rough, granular texture. They are elongated and one to two inches long. The juveniles emerge in six to nine weeks and are eight to 13 inches long, about one-quarter-inch in diameter.

Food. When hunting, the black racer moves swiftly through the grasses, its head elevated above the rest of the body. It hunts down and consumes large insects, lizards, small rodents, other mammals and even other snakes. When possible, the racer preys on birds and their eggs (the ground-nesting killdeer could easily be a potential target) and occasionally takes frogs and salamanders to alter its diet, or perhaps as a last resort to finding a meal.

Figure VI-16



Though only temporarily abandoned, these killdeer eggs could be easy prey for the swift-moving black racer.



Northern Ringneck Snake

Diadophis punctatus edwardsii

General characteristics. The northern ringneck snake is a secretive animal, not often seen even by persons who spend a great deal of time outdoors. It usually moves about after dark, making it even less likely to be observed. This relatively small snake is harmless, although it can emit a pungent, unpleasant-smelling musk that may help repel an attacker.

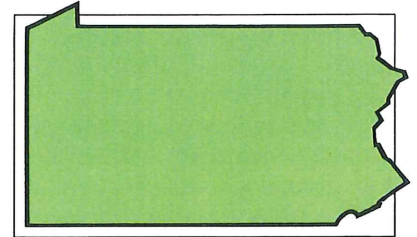
Identification. The ringneck snake in Pennsylvania reaches adult sizes of 10 to 24 inches while maintaining a slender build. Its distinguishing characteristic is the golden or yellowish ring that encircles the neck. The back and sides are usually gray, but at times can be black or even brownish. The belly is almost always a uniform yellow, although at times it may have a center row of black dots. The anal plate is divided and the scales are smooth. The smooth scales help distinguish this snake from the juvenile northern brown snake, which also has a collar but which has keeled scales.

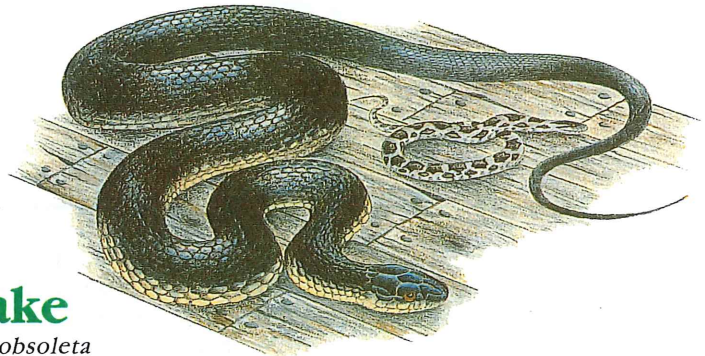
Range. This reptile is found from Nova Scotia to Georgia, west to Wisconsin and down the Mississippi Valley. The northern ringneck snake is found throughout Pennsylvania and is partial to moist areas.

Habitat. It is more at home in a forest than it is in grassland, and a rocky, wooded hillside could easily host this unassuming reptile. It seeks cover under flat rocks and logs or might even wriggle beneath the loose bark of a dead oak.

Reproduction. The ringneck snake mates in the spring or fall. Two to six elongated white or yellowish eggs are laid in June or July, sometimes in communal nesting sites among decayed logs or rocks. Initially about one inch long, the eggs increase in size after being deposited. They hatch in about eight weeks, releasing juvenile ringneck snakes four to six inches in length. The snake matures in two to three years.

Food. At mealtime, the ringneck snake partially constricts its prey before attempting to swallow it. Salamanders are an important part of its diet, but the ringneck snake also takes worms, slugs and lizards. Even newborn snakes can be targeted by a hungry ringneck snake. Insects round out a somewhat varied diet.





Black Rat Snake

Elaphe obsoleta obsoleta

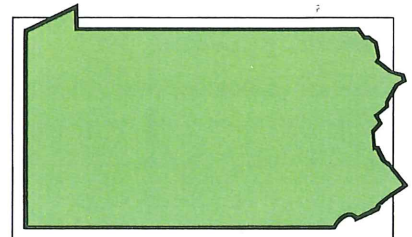
General characteristics. This is the familiar “black snake.” The black rat snake is the largest of 21 species generally recognized to be indigenous to the state. Adult lengths of 42 to 100 inches have been recorded. The black rat snake is active during the day throughout the cooler months of spring and autumn. As the long days of summer grow hotter, it becomes more nocturnal in its movements, resting in a cool retreat as daytime temperatures climb. The black rat snake is a powerful constrictor. It uses this physical strength to subdue its prey by suffocation. Musk glands located in the vent can emit a foul-smelling fluid, a defensive trait common among snakes.

Identification. The black rat snake is plain, shiny black. The skin between its scales may be bluish white, yellow, red or orangish, although this coloration is not always evident. The belly of the black rat snake is an even shade of white or yellow with darker mottling of gray or brown. The belly becomes more slate gray as it approaches the tail. The chin and throat areas are a toneless white or cream. The head of the black rat snake is clearly defined in relation to the neck and body. A flattened snout seems to emphasize the head’s squarish appearance. Also, the black rat snake does not have the rounded or tubular body common to most snakes. Its belly is flat, meeting the sides at an angle. If one could imagine it viewed from the end, it would resemble a loaf of bread rather than appear circular. The black rat snake has a divided anal plate. The scales are only weakly keeled.

The young black rat snake is deeply patterned down the back and onto the tail. The vivid dark-gray or brown blotches contrast strongly at first with the paler gray body tones, but as the snake grows the pattern darkens. By the time the snake approaches three feet in length (about two years old) these markings are often lost, and it has assumed the uniform black appearance of the adult black rat snake. The pattern, on close examination, can sometimes still be seen.

The black rat snake frequently is confused with the black racer, but several elements can be used to distinguish between the two. First, the head of the black racer is narrow. The black rat has a squarish head, more broad and with a flattened snout. Second, the scales of the black racer are smooth and unmarked with other colors. The scales on the middle of the back of the black rat snake are slightly keeled, and although its scales seem to be edged in bluish white or yellow, the skin between them is the lighter color.

Range. The black rat snake ranges from southern New England and Ontario south to Georgia, and from Wisconsin to





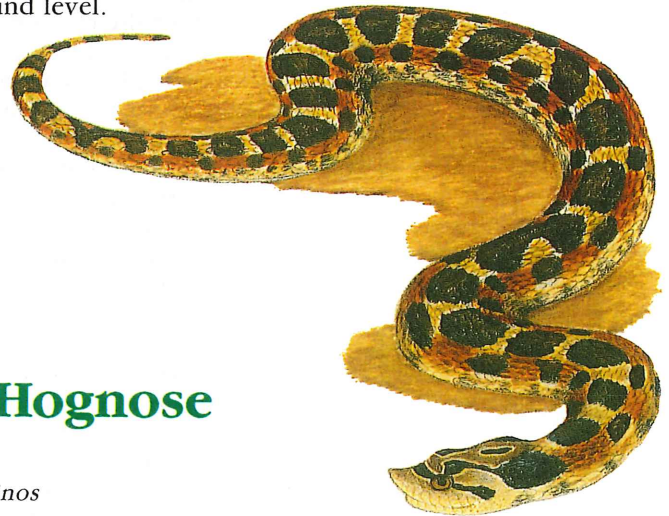
Louisiana. The entire state has some population of black rat snakes, and it is seen quite frequently.

Habitat. The black rat snake occupies a variety of habitats. Anglers, hikers and farmers can expect to see one of these large snakes almost anywhere. It prefers hardwood forests, wooded valleys and hillsides, but the black rat snake might feel just as welcome in an old field, barnyard or active farmland.

Farms might be a favorite because they usually offer a good supply of mice and other small mammals. The black rat snake is an excellent climber and uses small angles protruding from the belly scales to grip the rough bark of a tree. This ability allows easy access to the hollow cavity of an old tree and possible relief from unbearably hot summer temperatures. As winter approaches, the black rat snake seeks shelter underground, sometimes denning with rattlesnakes or copperheads.

Reproduction. The black rat snake locates a suitable mate and breeds in April to June or sometimes not until autumn. By June through August five to 30 eggs are left by the female in decayed logs, piles of leaf litter or under an amply sized rock. The eggs are smooth-shelled and leathery when deposited. They are covered with a moist, glue-like substance that hardens and adheres to the eggs as it dries, becoming slightly yellowish in the process. This causes the eggs themselves to become glued together. The eggs are oblong and 1½ to just over two inches in length. The incubation period takes seven to 15 weeks and ends with the emergence of young black rat snakes 10 to 16 inches long.

Food. The black rat snake hunts on and off the ground because it is capable of climbing with little effort. The young of the species may feed on tree-frogs, but also take mice and other small mammals. Birds and their eggs fall prey to the black rat snake, too, so it is evident that not all of its foraging is restricted to ground level.



Eastern Hognose Snake

Heterodon platyrhinos

General characteristics. The hognose snake has been pegged with several formidable-sounding nicknames: puff adder, hissing adder and spreading adder. All arise from a behavior contrived to scare off would-be attackers. When disturbed, the hognose snake widens its neck to take on a hood-like appearance (See Figure VI-17). It does this by flattening the head and neck, spreading long rib bones outward. Then, inflating the body with air, hiss-

ing and striking out, the hognose snake suddenly resembles a fearsome-looking creature, but it is harmless.

If awards in various categories were given to snakes, the eastern hognose snake would win hands down for “most dramatic performance.” It alternates between playing dead and performing a series of aggressive-looking maneuvers that ultimately prove to be more of a decoy than anything else.

If approached, the hognose snake may attempt to fool the intruder by rolling over and “playing dead.” A few convulsive jerks may first set the stage and then with mouth agape and tongue hanging out, the performance ends with the body frozen in place. If picked up, the snake suddenly goes limp. But returned upright to the ground it again quickly rolls over on its back, apparently forgetting it is “dead.”

In Pennsylvania, the eastern hognose snake resides in a major portion of the state, although it is not found in abundant numbers. Adult sizes vary from 18 to 45 inches.

Identification. A pointed and slightly upturned snout gives the hognose snake its name. It has a wide neck leading to a stout body. The body color varies and may be yellow, tan, brown, gray or reddish-hued. More or less square blotches appear on the back, alternating on their edges with round dark spots. Some specimens have been observed on which there are no discernible blotches. Instead, they are a uniform black, brown or greenish. The belly is yellow, light gray or pinkish and is mottled with gray or shades of green. The underside of the tail is lighter than the belly. A divided anal plate and scales that are keeled complete the description.

Range. The eastern hognose snake, though limited in numbers, inhabits roughly the eastern two-thirds of the state. Its range arcs from Somerset County in the southwest to Wayne County in the northeast. It also dwells in a portion of the Lake Erie Drainage. Outside of Pennsylvania, its range extends from New England to Florida and west to Minnesota and Texas.

Habitat. The hognose snake likes dry terrain, preferring open areas, thinly wooded uplands or rock-strewn hillsides. Sandy and other dry soil that is easily crumbled attracts the hognose snake, and it occasionally is seen by farmers working their cultivated fields. During the winter months, the hognose snake seeks relief by burrowing deeply into the soil.

Reproduction. Mating can occur in either the spring or fall. The hognose snake lays eggs usually in June or July, but sometimes as late as August. The female deposits from six to 61 eggs in a shallow cavity of loose or sandy

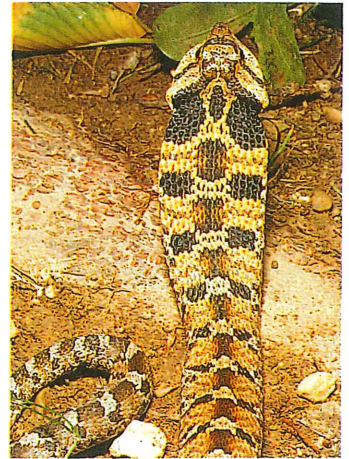
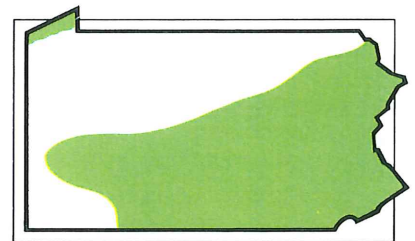


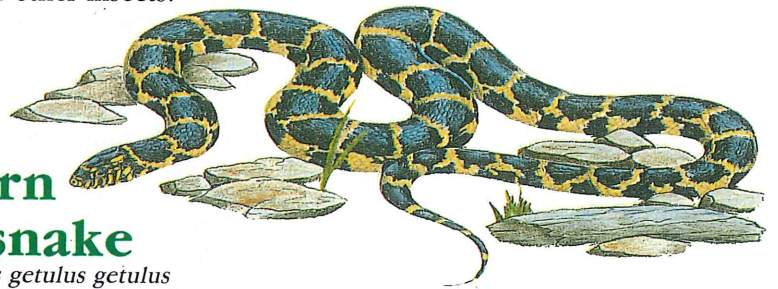
Figure VI-17
Spreading its neck hood-like is only one ploy used by the eastern hognose snake to scare off an intruder.





soil. Leathery, white and thin-shelled when released, they are about 1 ¼ inches in length and elongated. The eggs swell to become more spherical while increasing in size by about one-third. They hatch in 40 to 65 days, producing youngsters of about six to nine inches in length. The hatchlings display the same markings as the adult hognose snake, but tend to be more gray than yellowish brown.

Food. The eastern hognose snake is most active during the day. That's when it feeds. Toads and frogs are the mainstay of the hognose snake diet, although salamanders may be added. The young hognose snake consumes crickets and other insects.



Eastern Kingsnake

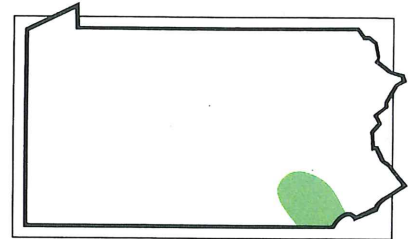
Lampropeltis getulus getulus

General characteristics. Although it has been described as an attractive snake, the eastern kingsnake is one of the least sociable, clashing at times with other snakes. It has been known to wrap itself around copperheads and other snakes to suffocate its victims. The kingsnake is reputedly immune to the venom of pit vipers.

The kingsnake becomes nocturnal during the hottest days of summer, but otherwise it is most active during the daylight hours. It shows a particular preference for moving about in the early morning hours and again toward twilight. The kingsnake is a close relative of the more common milk snake. It is a large snake, reaching adult sizes of three to over six feet. It has been known by several other names, such as thunder snake and chain snake.

Identification. Its nickname "chain snake" is descriptive of the bold yellow or white chain-like pattern that laces the body. This design contrasts sharply with the rest of the body, which is chocolate brown to shiny black. Yellow or white blotches often cover the black belly. The kingsnake's narrow head is marked with yellow-white. The neck is distinct and emphasizes the stout, cylindrical body. Smooth scales cover the body. The anal plate is single.

Range. In Pennsylvania, the eastern kingsnake historically has been recorded from a very limited area, in parts of two counties in the southeast. However, no verified specimens exist from Pennsylvania, and the status of this species as a bona fide member of our snake fauna is still questionable. It is known from southern New Jersey to Florida and west to the Appalachians and southern Alabama.

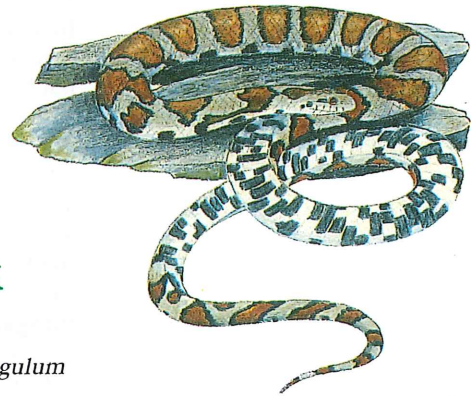


Habitat. The kingsnake is primarily a terrestrial creature, although it makes its way up the trunks and branches of shrubs and small trees every so often. Its preferred habitat consists of rocky, wooded hillsides, especially those

near water. It can be found within swampy areas as well. Stream banks are a favorite haunt because they often are a ready source of turtle eggs and water snakes. The kingsnake is a willing swimmer when the occasion calls for it. Logs, debris and piles of loose rocks offer hiding places for this often secretive reptile.

Reproduction. Seeking and finding a mate from early spring to late June allows the female to deposit from five to more than 20 eggs sometime from June through July. The eggs are leathery and yellowish to creamy white. More or less elongated, the eggs measure 1 1/4 to nearly three inches long. The female coils herself around the eggs perhaps for a day or two and then departs. After incubating eight to 11 weeks, the eggs hatch to produce a miniature version of the parents. The hatchlings measure nine to 12 inches.

Food. The eastern kingsnake is a strong constrictor and uses this physical power to disable its prey. Its menu consists of other snakes including copperheads and rattlesnakes. It is thought immune to the venom of the state's poisonous snakes and thus can attack these species with little apparent harm to itself. It also pursues lizards, rodents and birds and their eggs.



Eastern Milk Snake

Lampropeltis triangulum triangulum

General characteristics. In Pennsylvania at least, the eastern milk snake is the subject of more tales and is more often mistakenly identified than any other snake. It is among the state's most beneficial snakes, but sadly, is also the most often killed in mistake for a copperhead. Actually, there is only a superficial resemblance between these two snakes. The head of the copperhead is an easily recognized coppery color without any marks. The head of the milk snake is light with brownish marks. The belly of the copperhead is unmarked and a uniform cream or off-white. The belly of the milk snake is white with dark splotches resembling a checkerboard pattern (See Figure VI-18).

Other snakes confused with the milk snake include the northern water snake with its keeled scales, compared to the milk snake's smooth scales. The northern water snake also has a divided anal plate. The milk snake's anal plate is single. The juvenile northern black racer and black rat

Belly of Eastern Milk Snake and Northern Copperhead

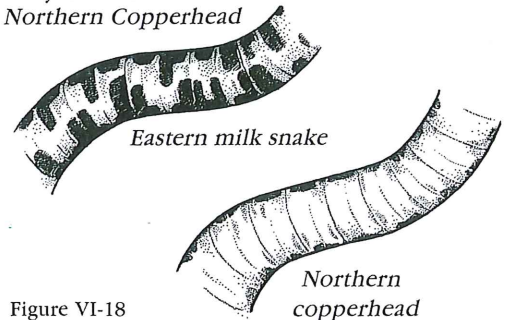
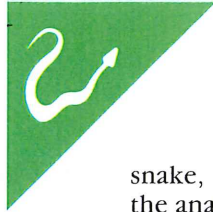


Figure VI-18



snake, which unlike their adult counterparts are patterned, can be told by the anal plate. Both have divided anal plates compared to the single plate of the milk snake.

The milk snake, contrary to popular belief, does not milk cows. Thus, this alleged habit hardly contributed to its name. Rather, the name probably originated from its habit of spending a lot of time around barns, not a bad idea considering its fondness for mice.

The eastern milk snake, although considered to be more secretive than many other snakes, still is seen quite often. It appears in numbers throughout its range. Adults attain lengths of two to over four feet when fully grown.

Identification. The most important identifying characteristic of the eastern milk snake is its belly. The belly is white or cream-colored with dark more or less square splotches that create a checkerboard effect. This definitive pattern separates the milk snake from the copperhead, which has a uniformly colored white to grayish belly with sometimes mottled markings or cloudy blotches (See Figure VI-18). The body of the eastern milk snake is gray or tan. This color is interrupted with chocolate-brown to reddish-brown blotches or saddles that cross over the back and down each side. These darker saddles are bordered with black. They are widest across the back, nearly rectangular but may become narrower as they continue down the sides. This, too, can be used to distinguish the milk snake from the copperhead, which has dark bands that are at their narrowest across the back, wider at the bottom. Smaller, dark blotches also appear low on the side, near the belly. They fall in place between the bottoms of the larger saddles. A Y-shaped or V-shaped dark mark appears on the nape of the neck, extending onto the head. Smooth scales shield the body and the anal plate is single.

Range. You are likely to run into the eastern milk snake nearly anywhere in the state because it is distributed in all 67 counties. It occurs over much of the Northeast, extending well into Canada and west to Minnesota.

Habitat. The milk snake does not prefer any particular type of habitat and is apt to reside in suburban as well as rural areas. Damp bottomland, meadows and farmland harbor the milk snake. But pine forests, open deciduous forests and rocky hillsides also are acceptable to the milk snake in which to make its home and forage for food. Rotting logs and damp trash offer convenient places for the milk snake to take refuge.

Reproduction. Leaving the den during the spring months, the eastern milk snake immediately begins its search for a mate. In June or July, the female deposits from six to 25 or more elliptically shaped eggs, often in a rotted log. The eggs incubate for six to nine weeks, and in August or September the juveniles emerge. Some five to 11 inches long, they are more brightly colored and their patterns more sharply contrasted than their parents.

Food. The eastern milk snake's favorite prey is small rodents, and mice make up the largest portion of this group. Other snakes, including venomous species, also are taken, and lizards and an occasional bird supplement the diet.

