Natural Heritage & Endangered Species Program

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Massachusetts Division of Fisheries & Wildlife

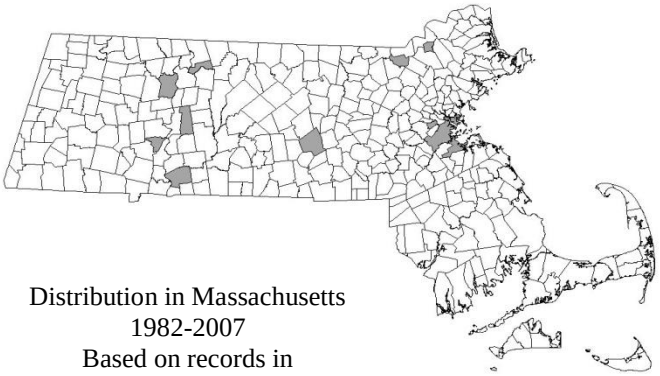
Eastern Ratsnake
Pantherophis alleghaniensis

State Status: **Endangered**
Federal Status: **None**

DESCRIPTION: The Eastern Ratsnake is a wide-ranging eastern snake that is represented by five currently recognized subspecies: the Black Ratsnake, Gray Ratsnake, Yellow Ratsnake, Texas Ratsnake, and Everglades Ratsnake. The Black Ratsnake is the most widespread of the subspecies and is found from central Georgia north to Vermont and southern Ontario, and west to Illinois and Louisiana. All of the Eastern Ratsnakes found in the Northeast are Black Ratsnakes (*Pantherophis alleghaniensis*), and all of the descriptions in this fact sheet refer to this northern subspecies.

Jackson, S., and P. Mirick. 1993. *Massachusetts Snakes: A Guide*. University of Massachusetts Cooperative Extension System and Massachusetts Division of Fisheries and Wildlife, Amherst, Massachusetts.

Adult Eastern Ratsnakes are large, plain, shiny black snakes in the family Colubridae. Other names for this species are Black Rat Snake, Pilot Snake, or Pilot Black Snake. Some adults show traces of white patterning; actually this is pigmented skin that is exposed between the scale rows. The chin and throat are whitish and unpatterned. The undersides are mottled, with checkerboarded light and dark areas becoming uniformly slate gray towards the tail. Some individuals display only a few inches of white mottling on the belly before it changes to uniform gray. The eye has a black pupil typically surrounded by a distinctly white margin, but while this characteristic is particularly prominent in all juveniles, it is not always present in adults. Body scales are weakly keeled with apical pits. The keels are especially noticeable on the mid-dorsal portion of the body. A typical adult snake has 25 scale rows near the head (range 23 - 27) and 19 near the tail (range 17 - 21). The anal plate is usually divided or partially divided.



Distribution in Massachusetts
1982-2007
Based on records in
Natural Heritage Database

Juvenile Eastern Ratsnakes, from throughout the species' range, are distinctly patterned dorsally with black, diamond-shaped blotches against a pale gray base color. Ventrally, the pattern is the same as that found in adults. The juvenile coloration changes rapidly and is nearly absent by the time the animal is 1 meter long. The eyes of juvenile Eastern Ratsnakes are large and have a black pupil surrounded by a distinctly white margin.

There are no color differences between males and females. However, male Eastern Ratsnakes have proportionately longer tails (16-19% of total body

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length) compared to females (14-18% of total body length).

The Eastern Ratsnake is the largest snake in Massachusetts. Large adults commonly exceed 200 cm in length. J.A. Allen mentions several specimens between 7 ft. (213 cm) and 7 ft. 9 in. (236 cm) being killed in the vicinity of Springfield, Massachusetts, during the 1860s. The largest Eastern Ratsnake ever recorded was 256.5 cm (about 8.4 feet). Hatchling lengths range from 29 - 37 cm (11 – 14.5 inches) total length.

SIMILAR SPECIES: When young, Eastern Ratsnakes may be confused with other snakes that have "saddlemark" patterns, in particular with Milk Snakes (*Lampropeltis triangulum*) and North American Racers (*Coluber constrictor*, also known as Black Racers). Look for the distinct white-margined eyes of juvenile Eastern Ratsnakes and use a magnifying glass to see if there are keeled scales on the middle of the back. North American Racers have dark eyes and smooth scales, and Milk Snakes have smooth scales.

Adult Eastern Ratsnakes are often confused with North American Racers, but can be easily distinguished by the ratsnakes' keeled scales and sometimes by their behavior — racers tend to be extremely alert and quick to flee *when warm*, while ratsnakes are more lethargic and slow to take alarm. Adult ratsnakes are also much more heavy-bodied than racers. Ratsnakes are sometimes confused with Timber Rattlesnake (*Crotalus horridus*) because ratsnakes sometimes vibrate their tails at high speed when alarmed, but they lack an actual rattle. When a ratsnake vibrates its tail on dry leaves, it may sound very similar to the rattle of a rattlesnake.

RANGE AND HABITAT: The Eastern Ratsnake ranges from central Georgia north to Vermont and southern Ontario, and west to Illinois and Louisiana. Regionally, it is found in Connecticut, southwestern Rhode Island, Massachusetts, and central Vermont. Massachusetts' populations are found in a few widely scattered locations — the Connecticut River valley, southern Worcester County, and Bristol County. Historically, the Eastern Ratsnake may have been more widely distributed in the state. Allen, in 1868, mentions that Eastern Ratsnakes are "not rare along the Connecticut... from Longmeadow to Mt. Tom" being about "one-half as numerous as the common black snake [Black Racer]".

In Massachusetts, Eastern Ratsnake distribution seems to be restricted by the availability of suitable hibernating sites. Since New England is the northern limit of this animal's range, hibernacula must be situated in areas with southern exposures to receive the maximum thermal benefit from the winter sun and provide basking areas for snakes in the early spring and late fall. Eastern Ratsnakes may share hibernating sites with other species of snakes such as North American Racer, Copperhead (*Agkistrodon contortrix*), and Timber Rattlesnake.

Aside from the need for specialized sites for hibernation, Eastern Ratsnakes are found in a variety of woods and forests, as well as in adjacent fields, thickets, and other early successional habitats that support populations of its prey species.

LIFE HISTORY AND ECOLOGY: After emerging from the hibernacula in the spring, ratsnakes disperse into adjacent woodlands to feed and mate. The species is well adapted to arboreal foraging, which appears particularly prevalent in the spring and early summer, but also forages on the ground and will enter rodent holes in search of prey. While some individuals remain in forested habitats throughout their annual activity period, others spend considerable time in edge and field habitats. Virtually nothing exists in the literature regarding the natural history of the Eastern Ratsnake in Massachusetts, but a telemetry study conducted with individual snakes from a Worcester County population indicates the animals ranged less than a mile from their hibernacula during their annual activity period. In this study, the individual annual activity area varied from a small 28 acres (11.3 ha) to 158 acres (64 ha) (P. Mirick, unpublished data). Based on data collected in New York, Massachusetts, and Connecticut, it appears that Eastern Ratsnakes enter their hibernacula in late fall, probably early to mid-November, and emerge from den sites around mid-April (although sometimes as early as March).

Mating occurs after emergence, probably late April through May. After a gestation period of 31 to 57 days, eight to twelve eggs are laid in a clutch in piles of decaying leaves and other rotting vegetation, stumps, or hollow logs and trees. Young hatch in late summer.

Ratsnakes feed primarily on small mammals such as deer mice (*Peromyscus* spp.), voles (*Microtus* spp.), Eastern Chipmunks (*Tamias striatus*), squirrels (*Sciurus* spp.) and small cottontails (*Sylvilagus* spp.). However, no less than 25 species of nestling, fledgling and adult birds have been mentioned as prey items, as well as reptiles and amphibians. One captured Massachusetts specimen disgorged a clutch of mallard duck eggs. Live prey is seized in the snake's jaws, and then constricted. Juvenile and young Ratsnakes are probably eaten by any predator capable of over-powering them. Adults are probably taken by mink and larger carnivores and by large birds of prey.

THREATS: Eastern Ratsnake populations are threatened by: (1) habitat alteration; (2) collecting for the pet trade; and (3) roads, both as barriers to migration and as sources of vehicular mortality. Increasingly, houses are being built along ridgelines and rock outcrops that historically served as refuges for these animals. The succession of open agricultural land to second-growth forest has led to a relatively homogeneous upland habitat; this absence of diverse habitats leads to reductions in the number of suitable prey items available.

As well, Eastern Ratsnakes have long been popular in the pet trade, in part because of their relatively docile nature and large size. In recent years, public interest in reptiles has increased enormously. With this increase in interest comes a concomitant increase in collecting pressure. Because of their dependence on specialized hibernacula, to which snakes return year after year, a population of ratsnakes can easily be eliminated in a few years by collectors who focus on finding dens. In Massachusetts, it is not only unlawful to capture a wild Eastern Ratsnake; it is also unlawful to possess an Eastern Ratsnake from any other source, such as from out of state.

Increased development near hibernacula creates a proliferation of roads. As more roads intersect migration routes and transect foraging areas, more and more snakes will be killed by vehicles.

MANAGEMENT RECOMMENDATIONS:
Continuing efforts must be made to locate and assess the habitat and, especially, denning locations of all populations of this species in the state. Detailed studies need to be conducted on select populations to determine accurately critical biological parameters necessary for protecting this species in Massachusetts.

Vehicular traffic of all kinds should be minimized within about 1 km of den sites, but small-scale agriculture and forestry may benefit Eastern Ratsnakes, as they create and maintain edge habitats. The details of agricultural and forestry practices in Eastern Ratsnake habitat should be developed in consultation with Natural Heritage & Endangered Species Program biologists.

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