



# Salamanders of Rhode Island

Red-backed salamanders are a common and plentiful amphibian, frequently discovered beneath the logs and leaf litter around Rhode Island. While this one little vertebrate is well known, few have seen all 8 salamander species that inhabit the state, including the remarkable red-spotted newt. While all fall into the family Salamandridae, each species has a different way of enduring the seasons and ensuring the survival of their offspring. Their permeable skin allows them to absorb water and nutrients, but human impacts have turned this beneficial adaptation into a dangerous weakness that exposes amphibians to chemicals and pollution. Protecting and connecting habitats and maintaining a healthy ecosystem is key to conserving these charismatic creatures. Most salamanders share similar diets, eating insects and other small terrestrial invertebrates. Tadpoles typically feed on algae, however, marbled salamander tadpoles are known predators and will eat the eggs and larva of other amphibians.

## THREATS TO SALAMANDERS

As amphibians, salamanders are considered indicator species, meaning the health of their populations can tell us about the health of the environment. Habitat loss, pollution and the human-mediated spread of disease are all serious risks to salamanders. Certain Rhode Island salamander species are particularly vulnerable to these threats and require special attention.

**Habitat Loss and Fragmentation:** The biggest threat that salamanders face, like many other animals, is habitat loss and fragmentation. While Rhode Island species live in a variety of habitats, it is essential that these habitats are connected to allow animals to safely access the resources they require. Fragmentation increases road mortalities, killing salamanders as they attempt to cross the road to reach isolated sources of food and shelter.

**Disease:** [Chytridiomycosis](#), or “Bd”, is an infectious disease caused by the Chytrid fungus (*Batrachochytrium dendrobatidis*) that has devastated amphibian populations world-wide. The Chytrid fungus causes thickening of the normally permeable skin, disrupting an amphibian’s ability to absorb water and breathe. This disease primarily impacts frogs, but salamander species are susceptible, as well. Salamander Chytrid Fungus, or “Bsal”, is another species of Chytrid fungus, just recently detected in 2013, that is caused by *Batrachochytrium salamandrivorans*. Bsal impacts salamanders in a similar fashion to Bd, but is

not yet widespread. It is known to be particularly lethal to newts, including our local red-spotted newt. If Bsal arrives in North America, the global hotspot for salamander biodiversity, it will have catastrophic consequences.

[Ranavirus](#) is an infectious disease affecting reptiles, amphibians and fish with up to a 90-100% mortality rate. There are several different kinds of Ranavirus that impact species at different levels. This disease is believed to be responsible for many recent massive mortality events around the world and, unchecked, could eliminate entire species.

**Disease Prevention:** The greatest risk with all of these diseases is transfer to new, uninfected, populations. To avoid further spread of these diseases, all equipment should be bleached and scrubbed in a 3% bleach solution before entering a wetland and between wetlands. This includes boats, paddles, shoes and anything else that comes into contact with the water. Never relocate an animal, it is illegal and can transfer disease to new locations. For more information on proper sanitation procedures, [click here](#).

**Other Threats:** Other sources of mortality include pollution as a result of run-off from roads, lawns and factories and predation from subsidized predators such as cats and raccoons, whose populations increase alongside human populations. **It is illegal to take an animal from the wild to keep as a pet, even temporarily.** Removing adults, tadpoles or eggs from their natural habitat can harm sensitive populations. Releasing any kind of native or non-native animals into the wild can introduce diseases and could potentially establish invasive species, which could harm our native wildlife.

## LEARN MORE

*Amphibians of Rhode Island*, by Division of Fish and Wildlife Biologist Christopher Raithel, contains in-depth information on all of our native species. To learn more, [click here](#).

Amphibian and reptile sightings can be reported using the RI Division of Fish and Wildlife HerpObserver App. For more information [click here](#).

# Salamander Species Profiles

Christopher Raithel



## SPOTTED SALAMADER (*Ambystoma maculatum*)

**Habitat:** Spotted salamanders can be found in shaded wetland and nearby forested habitats throughout Rhode Island, excluding Jamestown and Block Island. They spend most of their lives below the ground or hidden beneath logs or leaf-litter. They only enter the water as adults to mate and lay eggs in seasonal wetlands.

**Behavior:** During the winter they are thought to remain somewhat active beneath the ground in small mammal burrows or within root systems below the frost line. Adults emerge in March after rain and migrate to their breeding grounds. Spotted salamanders breed in late March to mid-April and lay their eggs in fist sized masses enveloped in a gelatinous layer. Egg masses are attached to vegetation below the water or laid directly on the bottom of pools. Eggs hatch in early May and most metamorphose around August, there are only a few accounts of larvae overwintering.

### IDENTIFICATION

**Appearance:** Heavy bodied. Back dark grey, black or brown with two uneven rows of yellow spots running from head to tip of tail. Belly light grey.

**Average Length:** ≈17cm

**Similar species:** Marbled salamanders have larger, white markings on back.

Mary Gannon



## MARBLED SALAMANDER (*Ambystoma opacum*)

**Habitat:** Marbled salamanders are found throughout mainland Rhode Island, mostly in Kent and Washington Counties. They are tolerant of drier soils but breed in seasonal wetlands. Aside from breeding, they inhabit small mammal burrows or remain hidden beneath leaf litter.

**Behavior:** Adults are active underground during the winter, moving throughout small mammal burrows. Most become active in June and breed around September. Females excavate small cavities and typically lay clusters of around 50 to 100 clear eggs beneath leaf litter in dried ponds or shallow ditches. Females remain with eggs which become stained dark grey as she rotates them, keeping them moist until the nest is inundated by rainwater, triggering the eggs to hatch. Once hatched, they overwinter as larvae and come spring, their advanced development allows them to prey on other amphibian eggs and larvae. Larvae metamorphose into adults between June and early July.

### IDENTIFICATION

**Appearance:** Heavy bodied. Back black with white transverse markings from head to tip of tail. Belly brownish.

**Average Length:** ≈10 cm

**Similar species:** Spotted salamanders have yellow spots along back.





### NORTHERN DUSKY SALAMANDER (*Desmognathus fuscus*)

**Habitat:** Dusky salamanders are uncommon in Rhode Island, found mostly in Western portions of the state. They are mostly terrestrial but inhabit areas with saturated soils and are found adjacent to running water. They hide beneath leaf litter and will create or utilize burrows of other animals.

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#### IDENTIFICATION

**Appearance:** Body rounded and thick with line running down length of back and “costal grooves” or short transverse grooves along sides. Large “cheeks” and laterally flattened tail. Back dark brown or gray mottled with dull, creamy white belly.

**Average Length:** ≈8.5 cm

**Similar species:** Both red-backed salamanders and two-lined salamanders are much slimmer and two-lined can also be distinguished by their yellow belly.



### NORTHERN TWO-LINED SALAMANDER (*Eurycea bislineata*)

**Habitat:** Two-lined salamanders are found all throughout Rhode Island, excluding Block Island. They inhabit a variety of moist habitats but typically are found under logs and stones adjacent to running water with sandy or gravelly substrates.

**Behavior:** Two-lined salamanders move to wet areas with more stable temperatures such as springs, and remain active during the winter. They breed in their wintering grounds from around September to May. Females lay about 30 eggs around April and May. Adults commonly tend egg masses, which are white to pale yellow and are hung beneath stones in riverbeds. Eggs hatch around May to August and larvae may take several years to metamorphose.

#### IDENTIFICATION

**Appearance:** Slender bodied. Back yellowish, golden to olive green or grey. Two black stripes run from snout to tail tip. Belly yellow and unmarked.

**Average Length:** ≈8.5 cm

**Similar species:** No other salamanders have an unmarked, yellow belly.



### RED-SPOTTED NEWT (*Notophthalmus viridescens*)

**Habitat:** Red-spotted newts are found throughout Rhode Island but are more common in the Western part of the state. They are found on Block Island but are absent from the small bay islands. As larvae and adults, they inhabit permanent or semi-permanent ponds with aquatic vegetation. During their terrestrial, eft stage, they inhabit moist forests.

**Behavior:** Eggs are individually secured to aquatic vegetation and hatch between May and September. Larvae take several months before they metamorphose into a terrestrial “eft” stage, around late summer or early fall. Efts live on land and can take up to 7 years to fully mature. Adult newts and mature efts migrate to breeding ponds around March and April, where mature efts metamorphose into their aquatic adult form. Breeding occurs in early spring; some newts remain in breeding ponds throughout the summer and others move onto land to rest under leaf litter. It is believed newts spend the winter inactive on land, if their water source is not permanent. If their water source is permanent, they may overwinter in the water.

#### IDENTIFICATION

**Appearance:** Long, keeled (laterally compressed) tails. Back olive green, brown or yellow with two lines of red dots haloed in black. Belly yellow with black spots. Juveniles (Efts): Skin rough, back bright red, orange or brownish with two lines of red-dots haloed in black. Belly yellow.

**Average Length:** ≈9 cm

**Similar species:** Spring salamanders are far less common, much larger and have smoother skin than efts.

Christopher Raithel



### FOUR-TOED SALAMANDER (*Hemidactylium scutatum*)

**Habitat:** Four-toed salamanders are widely distributed throughout Rhode Island, except Block Island. They are tolerant of a wide variety of habitats from dry, upland forests to swamps or kettle ponds. They breed in a multitude of wetland habitats, often where sphagnum moss is present.

**Behavior:** Four-toed salamanders are thought to overwinter underground. They breed during September and October and lay about 40 opaque yellow or cream-colored eggs in the spring. They often nest in vegetation such as moss or leaf litter in communal nests, which multiple females tend. Once hatched, larvae make their way into the water where they metamorphose relatively quickly into adults around July or August.

#### IDENTIFICATION

**Appearance:** Back orange-brown marked with W-shaped indentations. Belly bright white marked with black spots. Snout short and blunt.

**Average Length:** ≈7 cm

**Similar species:** No other salamanders have bright white underside marked with black spots.

Christopher Raithel



### NORTHERN SPRING SALAMANDER (*Gyrinophilus porphyriticus*)

**Habitat:** Spring salamanders are very rare in the state, only occurring in the Northwest corner of Rhode Island. They are found around cool springs or seep-ages in higher elevations, hidden beneath rocks along the stream edge.

**Behavior:** Little is known regarding seasonal behavior of spring salamanders. It is thought that they remain active beneath the ground during winter, breeding anytime from late fall to late spring. Eggs are laid in the warmer months, attached in masses to the bottom of rocks in streams where females remain to brood. Larvae take about 4 years to mature.

#### IDENTIFICATION

**Appearance:** Stretched body with long, laterally flattened (keeled) tail and squared snout. Back pinkish-brown, orange to red and slightly mottled with brown. Belly yellowish-white or beige.

**Average Length:** ≈15 cm

**Similar species:** The juvenile stage of the red-spotted newt has rough skin and is much smaller.

Christopher Raithel



### EASTERN RED-BACKED SALAMANDER (*Plethodon cinereus*)

**Habitat:** Red-backed salamanders are found in abundance throughout Rhode Island except on Block Island and a few of the smaller bay islands. Though they prefer deciduous forests, they are tolerant of disturbance and are found in many developed areas. They can be uncovered beneath leaf litter and under rocks and logs in moist habitats.

**Behavior:** Red-backed salamanders remain somewhat active in the winter, digging their way into the soil. They emerge around March but estivate, or rest, during the middle of the summer when temperatures are high and moisture is low. Around June, females lay small, yellowish-colored eggs beneath logs, in soil cavities or under cover objects. Eggs hang from the ceiling of the nest cavity while females brood, defending the nest from intruders. Eggs hatch after about 6 weeks and larvae immediately lose their external gills. Juveniles look like miniature adults and remain with the female for up to 3 weeks.

#### IDENTIFICATION

**Appearance:** Small bodied. Thick tail, round in cross-section. Body black with variable colored stripe along back: brick-red, completely black (lead-backed morph), or golden. Belly dark grey with “salt-and-pepper” markings.

**Average Length:** ≈7.5 cm

**Similar species:** Four-toed salamanders have bright white belly with black spots.