Southern Torrent Salamander

(Rhyacotriton variegatus)

Range and Distribution

In Oregon, southern torrent salamanders are found in the Coast Range, western Willamette Valley, and Klamath Mountains. They can be found from Tillamook County in Oregon, south into Mendocino County in California. Where habitat is suitable, they are locally common and can occur from sea level to around 4900 feet in elevation.

Habitat Characteristics

Southern torrent salamanders are primarily aquatic and can be found in shallow, cold water such as seeps, springs, headwater streams, and the edges of larger tributaries. They are typically associated with shady mature forests where the closed canopy of the forest insulates streams from the sun and the wind, creating a stable, cold, and humid microclimate that is necessary for the survival of this species. In suitable habitats, salamanders occupy water sources with loose, coarse substrates and a low input of fine sediment. Individuals avoid the open water, preferring instead to use the spaces between cobble-sized rocks within the stream to find food or to hide from predators. Fully grown salamanders are occasionally found out of the water in areas that are also wet ("splash zone").

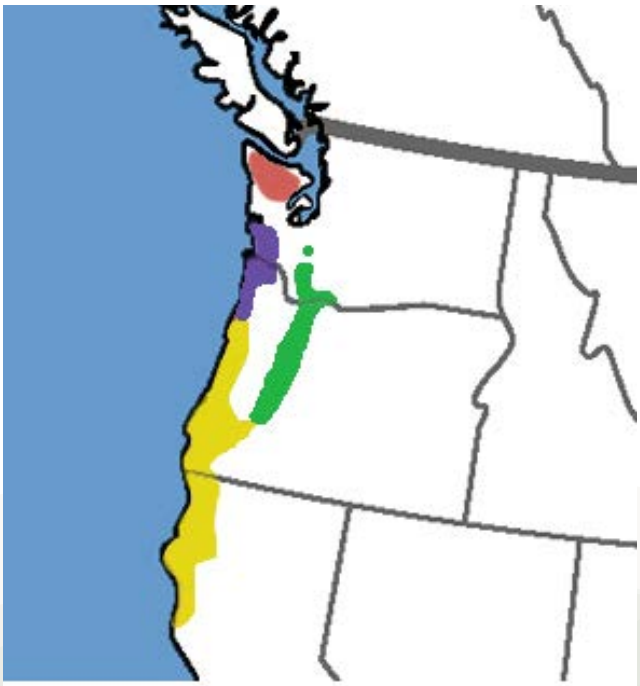
Diet and Foraging

The main prey items of adult southern torrent salamanders are aquatic and semi-aquatic invertebrates including springtails, amphipods, flies, beetles, and stoneflies. For some prey types, larval and nymph life stages may be preferred over adults. Juvenile diets are unknown, but likely similar to adults.

Species Description

Southern torrent salamanders are highly aquatic and closely associated with cool, clear, permanent water. They are a relatively small salamander with short legs and a short, vertically compressed tail. They have a small, broad head with large, protruding eyes, and a short snout. Southern torrent salamanders are olive to brown in color on their bacjs, with small black and white spots that extend onto their bright yellow underbelly. There are a lot of geographic differences in how spotted or speckled individuals of this species are. Adults can grow 1.5 to 2.5 inches snout to vent. Males are slightly smaller than females, with squared off lobes at the base of the tail. Aquatic juveniles (larvae), look similar to adults but have short external gills and a tail fin. This salamander has reduced lungs, and obtains oxygen through its skin. They are very intolerant of desiccation (drying out).

Similar species to the southern torrent salamander include three other species of torrent salamander (Cascade, Olympic, and Columbia) that were treated as one species until 1992 when genetic analysis showed that there were four distinct species of torrent salamander. All four species are morphologically similar. The geographic location where the specimen was found is important to note in identifying these species.



Range map adapted from Gary Nafis, California Herps

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Life History and Ecology

Like other other torrent salamanders, this species is adapted to life in cold water. Salamanders are *ectothermic,* (sometimes described as "cold-blooded") which means they rely on the environment to maintain their body at the optimal temperature for metabolism. For torrent salamanders, this optimal temperature is relatively cool - they are intolerant of warm temperatures (above approximately 63°F). They regulate their temperature behaviorally, moving to warmer or cooler locations to maintain their body temperature.

Torrent salamanders undergo complete metamorphosis, with distinct immature and mature forms. Larvae, the immature form, hatch from eggs and develop in the water. They are entirely aquatic. They look similar to adults, but have short, external gills, and a tail fin. When they metamorphose, their external gills shrink, their lungs develop, and their tail fin is reabsorbed. Adults are semi-aquatic, though are generally found close to streams.

Southern torrent salamanders mature slowly for amphibians: eggs may take around eight months to hatch, and larvae take about an additional two years to reach metamorphosis. Females then live in their adult form for one and a half to two years before reaching sexual maturity. The lifespan of southern torrent salamanders is currently unknown, although researchers suspect that the species is long-lived.

The courtship behavior of southern torrent salamanders has not been documented. The few nests that have been found for this species were deposited underwater in protected spots under boulders, or in deep and narrow rock crevices. Some documented nest sites are thought to represent eggs from multiple clutches. The egg-laying period likely occurs from August through November, and peak hatching time occurs in early spring. Eggs are laid singly in clutches of about 10 eggs, on average.

Movement behavior of southern torrent salamanders is poorly understood. One study of marked animals found that larvae moved an average distance of 7.2 feet per year, while adults moved an average of 3.2 feet per year. The species may be capable of short distance dispersal during moist conditions, though this is not well described.

Giant salamanders and garter snakes are predators of southern torrent salamanders (larvae and eggs). Other likely predators include salmonid fishes.

Fun Facts

- Their Latin species name, "*variegatus*," refers to the mottled pattern and heavy spotting that some populations of this species exhibit.
- Torrent salamanders are more cold-tolerant than other aquatic salamanders. Individuals have been recorded with body temperatures as low as 42.4°F (5.8 °C)!
- Southern torrent salamanders may be unpalatable to some potential predators, though more research is needed. Shrews have been documented rejecting torrent salamanders as prey, suggesting they may be noxious to shrews.
- The bright yellow underbelly of torrent salamanders may be *aposematic*, which means it is a warning to potential predators that they may not be good to eat.

Conservation

This species has likely experienced a declining trend in occurrence and abundance relative to historic conditions. Research suggests that certain forest management practices may be driving this pattern, resulting in significant habitat loss for increasingly fragmented populations throughout the species' range.

Southern torrent salamanders are also vulnerable to land-use changes that reduce habitat quality through increased sedimentation, decreased canopy cover, reduced headwater flows, or increased water temperatures. The life history traits and habitat associations of this species make it especially sensitive to rapid changes in environmental conditions. Conditions associated with increased wildfire frequency may exacerbate existing vulnerabilities by accelerating habitat fragmentation and declines in habitat quality.

You can help contribute to the conservation of southern torrent salamanders and other aquatic salamanders when hiking in their habitat. Be careful not to damage delicate riparian habitats by going off trail, pack out all trash, and dispose of waste responsibly. Walking in waterways or flipping over rocks can increase turbidity and cause unnecessary stress to salamanders. Avoid handling salamanders when you find them, as they have very absorbent skin. To help protect known populations of southern torrent salamanders and other amphibians found in headwater streams on your property, you can maintain a buffer around occupied streams that you do not treat in order to prevent sedimentation and temperature increases that would result from reduced canopy cover.

In Oregon, southern torrent salamanders are a Sensitive Species and an Oregon Conservation Strategy Species (Species of Greatest Conservation Need). For more information about the conservation status of southern torrent salamanders including special needs, limiting factors, data gaps, and conservation actions, refer to the Oregon Conservation Strategy.