

# Torrent salamanders

## (*Rhyacotritonidae*)

**Class** Amphibia  
**Order** Caudata  
**Suborder** Salamandroidea  
**Family** Rhyacotritonidae

### Thumbnail description

Small, short-tailed, greenish yellow, large-eyed salamanders found near cool water in seeps, springs, or flowing streams

### Size

3–4.5 in (7.5–11.5 cm)

### Number of genera, species

1 genus, 4 species

### Habitat

The name *torrent salamander* is derived from direct translation of the scientific name (Greek *rhyakos*, "stream," and *triton*, the Greek sea god). These salamanders rarely are found in torrential streams, although they are found in gravelly habitat beside such streams. More typically they are encountered in seeps and springs, especially where clear, cool water flows or drips over crumbling rocks. These habitats almost always are in closed-canopy forests often dominated by coniferous trees, but some are in riparian areas dominated by maples and alders.

### Conservation status

Not classified by the IUCN



### Distribution

Northwestern United States

## Evolution and systematics

Torrent salamanders constitute a unique lineage of salamanders that have no close relatives. Morphological and molecular data attest to the distinctiveness of this clade, but there is no clear sister taxon. These salamanders may be remnants of an early radiation of the Salamandroidea. When first discovered early in the twentieth century, these salamanders were thought members of the family Hynobiidae (well represented in eastern Asia but not otherwise known in the New World). They then were included in the Ambystomatidae and later in the Dicamptodontidae. In several respects, they resemble plethodontids, and they may be related to that group. At present torrent salamanders are recognized as a separate family.

## Physical characteristics

These are small to medium-sized (3–4.5 in; 7.5–11.5 cm) semiaquatic salamanders with relatively stocky bodies and broad heads with protuberant eyes and a short snout. Limbs are small but robust, and the tail is short and laterally compressed with a small keel. These salamanders have vestigial lungs.

## Distribution

This family occurs from the Olympic Peninsula in northwestern Washington in the coast ranges to southern Mendocino County in northern California, and in the Cascade range from the vicinity of Mount Saint Helens, Washington, to Lane County, central Oregon.

## Habitat

Torrent salamanders are aquatic and semiaquatic, inhabiting usually densely forested areas in small, clear, rapidly flowing streams, seeps in rocky areas, and rock crevices with thin layers of water cascading over the surface.

## Behavior

The behavior of this family is not well known. These salamanders are secretive and are seldom seen.

## Feeding ecology and diet

Little is known about the feeding ecology of this family. The diet probably consists of aquatic and semiaquatic insects, especially larvae, as well as other invertebrates.



Olympic torrent salamanders (*Rhyacotriton olympicus*) live in the clear, cold streams of the Olympic Mountains in Washington, USA. (Photo by Animals Animals ©Maresa Pryor. Reproduced by permission.)

### Reproductive biology

Fertilization is internal. Large, unpigmented, yolky eggs are laid in cold, clear water under rocks or in crevices. Eggs develop slowly, as do the aquatic larvae, which live for three or four years. Metamorphosis occurs at close to adult size, but it is not known how long it takes metamorphs to mature. Metamorphosis is a gradual and mild transformation. Adults are characterized by morphology more typical of juveniles of other taxa, especially with respect to skulls and limbs.

### Conservation status

No species are listed by the IUCN. Clearing of forests is the greatest risk to torrent salamanders, because it leads to habitat degradation. One species, *Rhyacotriton variegatus*, is protected in California.

### Significance to humans

The four species of this family are probably similar to each other in ecology and other biological features. They form a unique clade that harbors unique parasites. The primary significance to humans is a contribution to understanding of the dimensions of biodiversity in the Pacific Northwest region of California.

## Species accounts

### Cascade torrent salamander

*Rhyacotriton cascadae*

#### TAXONOMY

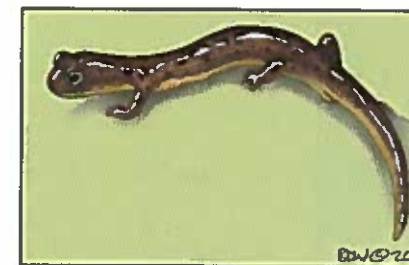
*Rhyacotriton cascadae* Good and Wake, 1992, base of Wahkeena Falls, Multnomah County, Oregon, United States.

#### OTHER COMMON NAMES

English: Cascades salamander.

#### PHYSICAL CHARACTERISTICS

Moderately small (3–4.5 in; 7.5–11 cm in total length) with a relatively stout body, a moderately broad head with prominent, protruding eyes and a relatively short snout, and a laterally compressed, keeled tail that is shorter than head plus body. Somewhat variable in coloration but usually rich brown above and yellowish below with greenish yellow in some specimens. The dorsal surfaces are richly marked with darker blotches and speckles. There is a sharp distinction between the brown coloration of the back and flanks and the yellow pigment of the belly. White flecking is found in the flank region above the transition to the yellow venter. The ventral surfaces are much less spotted than the dorsal ones. However, dark spots are present, as is fine gray flecking on the throat and chest. Males have swollen glands in the margins of the vent, and these produce a characteristically squared-off, conspicuous pair of structures.



*Rhyacotriton cascadae*

#### DISTRIBUTION

Cascade Mountains of Washington and Oregon from near Mount Saint Helens in Washington to central Oregon. Generally found at elevations below 2,000 ft (620 m).

#### HABITAT

Streams, usually in heavily forested areas. These salamanders avoid large streams but may be found near them in small, rapidly flowing tributaries, where they live under moss-covered rocks and in coarse gravel, even in talus in areas that are very moist. Water often is flowing through the rocks in thin sheets. Adults venture onto land but rarely go more than a few feet (1 m) from water. They may inhabit wet rock crevices. Larvae exist in the same habitat as adults but are strictly aquatic.



*Rhyacotriton cascadae*

#### BEHAVIOR

Not known. Extremely secretive; not seen unless actively sought through turning of rocks at the edges of the habitat.

#### FEEDING ECOLOGY AND DIET

Not known. Likely eat small invertebrates, especially aquatic insect larvae and mollusks.

#### REPRODUCTIVE BIOLOGY

Not well known. A related species lays eggs singly in small groups in cold water flowing through rocks and rock crevices. Females lay approximately eight relatively large, unpigmented, yolky eggs. Eggs probably are slow to hatch in the cold water. Larvae grow slowly, taking three or four years to metamorphose when they are relatively large (1.5–1.8 in; 37–45 mm).

#### CONSERVATION STATUS

Not threatened. The greatest risk for this species is clear cutting of forests, which severely affects local habitats by causing small watercourses to heat and dry.

#### SIGNIFICANCE TO HUMANS

None known. ♦

## Resources

### Books

Petranka, James W. *Salamanders of the United States and Canada*. Washington, DC: Smithsonian Institution Press, 1998.

*Rhyacotriton* (Caudata: Rhyacotritonidae)." *University of California Publications in Zoology* 126 (1976): 1-91.

David B. Wake, PhD

### Periodicals

Good, David A., and David B. Wake. "Geographic Variation and Speciation in the Torrent Salamanders of the Genus