Foothill Yellow-legged Frog *(Rana boylii)*

Range and Distribution

Historically, the range of foothill yellow-legged frogs stretched from west of the Cascades in Oregon to the Oregon coast, and south through the Coast Ranges to the San Gabriel Mountains and the Sierra Nevada Mountains in California and northwestern Baja California. They live at elevations ranging from sea level to 6,000 feet.

In Oregon, they have been found from sea-level to approximately 2,800 feet in elevation. They are rarely found in the northern portion of their historical range in the Cascade foothills east of the southern Willamette Valley. They are more common south of the Umpqua River drainage, but habitat losses have affected populations in the Rogue Valley.

Habitat Characteristics

Foothill yellow-legged frogs have historically occupied a wide variety of permanent and seasonal waterbodies, generally characterized by partial shading with basking sites with direct sun exposure, slow moving water, and a coarse, rocky substrate. They require medium or large rocks in shallow, slow-moving streams for egg laying sites so that eggs are protected from being washed away. Metamorphosed juveniles and adults may use smaller streams and creeks that feed into the main river channel (tributaries) for foraging and dispersal. In fall and winter, habitat used is typically small streams with permanent water available. Non-breeding habitat also includes upland riparian areas adjacent to waterbodies used.

Species Description

The foothill yellow-legged frog is a resident of lower elevation mountain streams west of the Cascades, readily identified by the distinct lemon-yellow skin under the legs. The rest of their body is variable in color, ranging from black to olive or greenish-brown. Some foothill yellow-legged frogs have dark spotting, while others do not. Their coloration and grainy skin provide incredible camouflage in coarse sandy substrates. They have very long legs, short, webbed back feet, and a wide, pointy head. They also have a light-colored bar across the head from eye to eye, and most individuals have brighter coloration in the upper half of the eyes. Their call is a faint, low pitched series of four to six notes per second that is rarely heard, as they call underwater. Adults average three inches in length from snout to vent. Tadpoles have eyes on the top of the head and are olive-gray with coarse brown spots.

Similar species found in Oregon are the northern red-legged frog and Cascades frog. These three species are readily identified by the color of the underside of their legs, though this is not always a characteristic that is visible. Foothill yellow-legged frogs have no mask through the eyes, and have indistinct dorsolateral folds, or ridges of skin along the length of their body. Both northern red-legged frogs and Cascades frogs have distinct dorsolateral folds all the way to their hip. Juvenile American bullfrogs, an invasive species in Oregon, can sometimes look similar to foothill yellow-legged frogs.

Approximate range of foothill yellow-legged frog, *Rana boylii*

OREGON CONSERVATION

Oregon Department of Fish and Wildlife

Life History and Ecology

Foothill yellow-legged frogs time their life cycle with the natural ebb and flow of water availability. In the spring, adults leave their overwintering habitat to congregate at breeding sites on the main portion of rivers and streams as temperature increases and as streamflow decreases following snowmelt. This is a risky time period where streamflow is often unpredictable, but provides tadpoles (the aquatic form that emerge from eggs) with a long season to reach metamorphosis (when they transform into their adult form) and grow before the winter.

Foothill yellow-legged frog eggs and tadpoles face a perilous path to reach adulthood. Females lay egg clusters averaging 1,000 eggs each in rivers and streams, where they are attached to the downstream side of rocks or vegetation. Eggs are laid in habitats that are just right: shallow, calm water that provides a safe nursery for tadpoles, but that won't dry up before they metamorphose. Egg laying may be timed with seasonal flows, as eggs are vulnerable to scouring from seasonal pulses of water or from desiccation in low flow years. Foothill yellow-legged frogs undergo complete metamorphosis: tadpoles are distinctly different in body form from fully mature adults. Tadpoles are fully aquatic, have gills and a tailfin, and do not have legs. During metamorphosis, they transform drastically; they grow legs, reabsorb their tail, and develop lungs. They develop at a variable rate depending on temperature and food availability: eggs hatch in 5 to 37 days, and the tadpoles transform into frogs at three or four months old.

Foothill yellow-legged frogs are a relatively long-lived frog: adults can live up to 12 years. Like other amphibians, they are *ectothermic*, meaning they rely on the environment to maintain their body temperature. Newly metamorphosed juveniles move upstream into small tributaries following fall rains. Adult frogs' overwintering strategies are poorly understood, but evidence suggests they shelter in areas protected from high stream velocity and some may overwinter in protected terrestrial sites.

Predators of all age classes of foothill yellow-legged frogs include garter snakes, bass, American bullfrogs and small mammals. Tadpoles and egg masses are subject to predation by a wide variety of species and serve an important role in the food web. Predators include rough-skinned newts, trout, green sunfish and diving beetles. They defend themselves with camouflage and by diving to the bottom of the water and hiding.

Fun Facts

- Females lay an average of 1,000 eggs that all hatch at the same time, sometimes after only 5 days!
- Foothill yellow-legged frogs live on the edge, breeding in areas that are vulnerable to scouring from late season rains or that may dry out in droughts. To give their eggs the best chance of survival in these fluctuating habitats, egg laying is timed with late spring flows.
- To escape predation, foothill yellow-legged frogs will leap into the water when disturbed and hide motionless on the bottom of a stream. Their coloration helps to camouflage them even in clear shallow water.

Diet and Foraging

Their diet consists of a wide variety of insects, snails and spiders which they catch using their long, sticky tongue. Adults may even occasionally eat recently-metamorphosed juveniles. Using their specialized mouthparts, tadpoles graze algae and detritus (dead organic matter) off the surface of rocks.

Conservation

Foothill yellow-legged frogs have experienced range-wide population declines and have disappeared from many of their historically occupied habitats. Once one of the most abundant amphibians in the Rogue River area, they are now rare or absent throughout their range in Oregon; surveys conducted in the 1990s at known historically occupied sites only found foothill-yellow legged frogs present in 43% of surveyed areas. The contraction of their range in Oregon is attributed to habitat loss driven by hydrological changes. Important habitat components such as gravel bars and low-flow nursery areas have been lost. Foothill yellow-legged frogs are also likely impacted by sedimentation and waterborne pathogens.

Homeowners can help protect foothill yellow-legged frogs and other sensitive invertebrates by using fertilizers and pesticides responsibly to ensure you are not contributing to chemical runoff into riparian habitat. You can also help by planting native plants and removing invasive plants. When recreating with off-road vehicles, be sure to stay in designated areas in order to avoid damaging wetlands. Avoid handling frogs and other amphibians when you find them, as they have very absorbent skin. Oils, salts, and products on your hands may damage their skin.

They are an Oregon Conservation Strategy Species, and a Sensitive Species in Oregon. Their Federal status is currently under review. For more information about the conservation status of foothill yellow-legged frogs including special needs, limiting factors, data gaps, and conservation gaps, refer to the Oregon Conservation Strategy.