

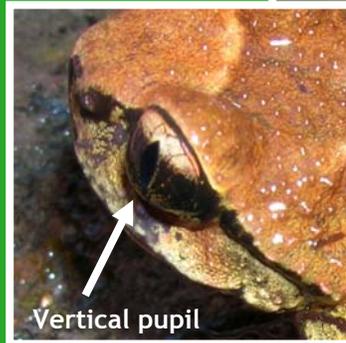
BC's Coast Region: Species & Ecosystems of Conservation Concern

Pacific Tailed Frog (*Ascaphus truei*)

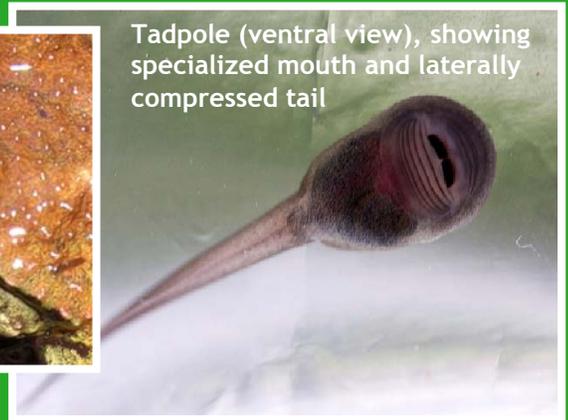
Global: G4, Provincial: S3S4, COSEWIC: SC, BC List: Blue Identified Wildlife



Adult male with "tail"



Vertical pupil



Tadpole (ventral view), showing specialized mouth and laterally compressed tail

Notes on *Ascaphus truei*: A member of the family Ascaphidae ("tailed frogs"), the genus is represented by only two species, Pacific and Rocky Mountain Tailed Frog, both found only in western North America. Tailed Frog do not have an actual tail, rather males possess a fleshy appendage that is an extension of the cloaca (exterior opening that serves both intestinal and reproductive tracts in some species). Tailed Frog are also the only North American frog to fertilize eggs internally. The "tail" appendage is an adaptation to reproduction in fast flowing water, directing sperm into the female and reducing sperm loss during breeding.

Description

Snout to vent length: 2.2-5.1 cm (females larger). Adult and juveniles are variable in colour, ranging from light brown, tan, grey-green to charcoal. Lighter coloured individuals may have irregular dark spots on back. The skin is covered with minute bumps giving the frog a 'pebbly' appearance. A light-coloured bar or triangle between the eyes and snout is common, a dark broken line extends from the tip of the snout along the eye to the end of the head. Unlike other frogs the head does not exhibit a tympanum (ear) and the pupil is vertical. Outermost toes on the hind feet are flattened and wide. This species does not have an ability to vocalize like other frog species. Tadpoles range from brownish-grey to reddish-brown or black and are up to 3 cm long prior to metamorphosis. In some populations (e.g. US), the tail has a white tip. The head is relatively flat and the tail is laterally compressed to provide streamlining in fast flows. Tailed Frog tadpoles have suction like mouth parts with rows of teeth on the top and bottom, allowing them to anchor to rocks (and other surfaces) in fast flowing water.

Diet

Foraging by adults and juveniles occurs primarily at night, close to water (occasionally underwater), and targets a variety of prey items, including spiders, ticks, mites, and various insects as well as snails. Unlike most frogs, the tongue of Tailed Frog is not attached at the front of the mouth and they lack the ability to flip it out to catch prey. Rather they have to grab prey items directly. Tadpoles use their suction-like mouth disk to adhere to rocks in fast-flowing streams where they scrape algae off the rocks with their rows of small teeth.

Look's Like?

Pacific Tailed Frog share habitat preferences and some basic morphological traits with other frog species including Northern Red-legged Frog and Western Toad. Western Toad tadpoles, typically found in shallow wetlands or vernal pool habitats, have been known to occur in fast flowing systems where they could be confused with Pacific Tailed Frog tadpoles¹. Northern Red-legged Frog can be highly mobile in riparian areas where adult and juvenile Pacific Tailed Frog may also occur. The somewhat 'pebbly' skin of Tailed Frog could also cause it to be confused with juvenile Western Toad.



Western Toad (juvenile)

¹ Rearing in flowing water habitats, while unusual, may reflect localized adaptations by some Western Toad populations. See Western Toad and Northern Red-legged frog factsheets.

Distribution

Elevation - 0-2140 m. Pacific Tailed Frog is distributed from northern California through Montana, Idaho, Oregon, Washington State and north into BC along the Coast Region up to the Alaska border. Most populations are typically found on the windward side of the Cascades and Coast Mountains, though a few scattered occurrences have been observed in leeward systems as far north of latitude 54° N. Coast Region populations are known to range from the Tulameen, Similkameen, Nicola, Coquihalla, Coldwater, Chilliwack, Bridal Falls, Harrison, Alouette, Pitt and Coquitlam watersheds, west along the north side of the Fraser River to the Squamish/Lillooet and Sunshine Coast area and then north along the Central and North Coast to Port Canal. While generally restricted to the mainland, small populations have been found on coastal islands of the Central Coast. The habitat conditions required by this species (fast flowing systems with cool water temperatures throughout the year and low sediment levels), have likely resulted in extirpated populations from many historic systems located in developed areas of the Fraser Lowlands. Populations in urban areas are still known to persist (e.g. southwest Coquitlam, Vancouver's northshore). Typically these populations are found in systems where surrounding forest structure and understory diversity, flow regimes and water quality remain relatively intact or are not significantly impacted by clearing or stormwater runoff. As populations can occur in relatively small systems, and island populations have been detected, the actual extent of potentially occupied watersheds on the Coast Region has yet to be determined.



Pacific Tailed Frog (*Ascaphus truei*), potential occurrence range for the Coast Region.

Habitat Preferences

Older forests tend to provide the more ideal microclimatic and microhabitat conditions for this species. Tadpoles and young-of-the-year metamorphs can also be found in high densities in streams flowing through young clear-cuts. However, presence in streams flowing through these areas is not necessarily indicative of long-term, sustainable populations. While often associated with steep gradient, non-fish bearing waters, this species does also utilize systems supporting resident fish species such as Bulltrout, Dolly Varden, Coastal Cutthroat, Steelhead and Rainbow Trout. Frogs overwinter in ice-free areas under stream substrates at or near the stream surface. Tadpoles appear able to survive dewatering events and have been found in ephemeral stream systems, reappearing when flows return, possibly surviving low flows or drying by seeking refuge under wetted substrate where oxygenated subsurface flow may occur at or near the surface of the channel bed.



Found in and around cold, clear (unsilted), fast-moving streams associated with old growth and mature second growth coniferous, deciduous, and mixed conifer-deciduous forest.

Critical Features

Preferred systems are <10 m in width and forested on both sides. This species has small lungs and relies on heavily vascularised skin for much of its respiration, making it especially prone to desiccation. The physiology of Tailed Frog results in narrow temperature tolerances, with lethal temperatures, depending on life stage and age class, starting at about 22°C. Adults rarely travel far from streambanks, but have been found under logs or other suitable cover in adjacent forests up to 40 meters from one year to the next and will travel further distances from waterbodies if suitable cool, moist micro-climates exist. Newly emerged juveniles appear to move the greatest distance, ranging up to 100 m from natal streams. Tadpoles prefer, smooth rounded substrate 5 cm and larger, not likely to fracture into angular pieces. Interstitial spaces (voids) between these larger materials provide refuge sites from flood events, bedload movement, predation, and warm temperatures.

Seasonal Life Cycle

The longest lived of the Anurids, Tailed Frog can live 15-20 years, and have the longest larval period (2-4 years) and longest time to sexual maturity (8-9 years), of all North American frogs. Sperm stays viable in the female’s oviducts until egg laying in June or early July. Each female produces a double strand of 44-85 colourless, pea-sized eggs that she attaches to the underside of a large rock or bolder in the stream in late summer. Embryos emerge approximately 6 weeks after egg deposition, feeding on a yolk sac which sustains them through the winter in the natal pool until their “suctorial” mouth is fully developed, after which they become more mobile.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
					Eggs laid (fertilized previous year).			Courtship / Breeding			
Larval stage (tadpoles) 2-4 years											

Threats

- ◆ Distribution (i.e. Areas of the South Coast) coincides with areas undergoing rapid development and habitat loss/alteration.
- ◆ Forestry and other resource extractive activities can alter microclimate regimes in riparian and upland forest areas, and increase water temperatures and siltation rates in occupied streams.
- ◆ Roadways with inadequately designed or perched stream crossings (e.g. culverts), can negatively effect flow regimes as well as provide barriers to movement by adults and tadpoles.
- ◆ Hydroelectric projects that divert or alter natural flow regimes or channel structure and seasonal wetted areas.

- ◆ Disturbance, clearing and fragmentation of upland terrestrial habitat reduces adult survival. Combined with a low dispersal rate, slow development, and low reproductive capacity, the species is highly vulnerable to local extirpation where its habitat is being encroached by human activities.
- ◆ Areas experiencing large-scale or persistent channel disturbance (natural or human caused), will have reduced likelihood of supporting Pacific Tailed Frog populations (adults and tadpoles).
- ◆ Climate change effects resulting in higher stream temperatures, droughts, or lower water flows. Combined with anthropogenic activities and natural events (e.g., mudslides/avalanches, storms, flooding) that increase siltation, water temperatures or levels, local populations may be severely impacted in various parts of their known range.
- ◆ Pacific Tailed Frog utilize their skin for respiration more than other frog species and as with most amphibians, easily absorb contaminants through their skin. Direct mortality or sub-lethal impacts can occur throughout all life-history phases from fertilizer and pesticide applications for silviculture management.

Conservation & Management Objectives

- ◆ Apply conservation and management recommendations as set out in “Accounts and Measures for Managing Identified Wildlife - Accounts V.2 Coastal Tailed Frog *Ascaphus truei*.” Integrate complimentary objectives and approaches identified in the “EBM Working Group Focal Species Project”, Watershed-level Protection and Management Measures for the Maintenance of *Ascaphus Truei* Populations in the Skeena Region and other management resources identified at the end of this factsheet.
- ◆ Inventory and monitor using Resource Inventory Standards Committee methodology #39 “Inventory Methods for Tailed Frogs and Pacific Giant Salamanders (Version 2.0)”².

Specific activities should include:

- ◆ Maintain microclimatic, hydrological, and sedimentation regimes to minimize the occurrence of extreme discharge events, limit the mortality rate of tailed frogs during floods, and meet foraging and dispersal requirements of post-metamorphic life stages.
- ◆ Ensure adequate buffers are applied to protect the broadest range of habitat features and functions (e.g. at a minimum those set out for Wildlife Habitat Areas for this species under the Forest and Range Practices Act). Riparian buffers imposed to protect fish habitat are likely insufficient for connecting and protecting the complete range of microclimate, water quality and dispersal requirements for this species.
- ◆ Maintain slash-free headwater creeks and forested riparian buffers, especially within fragmented areas.
- ◆ Collect information on population trends, including a monitoring plan for individual sites and watersheds and studies to monitor population responses to disturbance activities, habitat restoration, reintroductions, and the impacts of translocation on populations³.
- ◆ Avoid stocking of sport fish or transplanting of fish species to systems utilized by native amphibian species, especially those sites previously non-fish bearing.
- ◆ Maintain clean and stable cobble/boulder gravel substrates, natural step-pool channel morphology, and stream temperatures within the tolerance limits of the species. Silt generating activities and runoff should be appropriately managed to reduce contaminants and sediment loading to receiving waters.
- ◆ Clear-span crossings of stream are preferred. Culvert crossings should be a minimum of 2 meters in diameter, preferably open bottomed with a bottom layer of natural substrate.
- ◆ Employ integrated pest management approaches that reduce the need for chemical applications in silviculture practices.
- ◆ Implement habitat protection measures, including the acquisition of lands in which the species occurs and the creation of further “WHA’s”. To be useful, protected habitat needs to be large enough and in adequate condition for the species to carry out its seasonal activities and life history functions, including protection of not just riparian areas but also surrounding upland habitat and dispersal corridors.
- ◆ Encourage and support the voluntary cooperation of landowners and managers in stewardship activities on a variety of land tenures to ensure successful conservation efforts.

This species is listed under the Federal Species At Risk Act (SARA), is Identified Wildlife under the Forest and Range Practices Act and may be subject to protections and prohibitions under the BC Wildlife Act. Habitat for this species may also be governed under provincial and federal regulations including the Fish Protection Act and Federal Fisheries Act as well as Regional and local municipal bylaws.

² Other than areas supporting high density adult populations, typical visual encounter surveys (VES) for adults/sub-adults can produce inconclusive results. Larval surveys may provide greater certainty for inventory purposes. Other approaches to inventorying and monitoring such as those found in “Measuring and Monitoring Biological Diversity - Standard Methods for Amphibians” and “Suitability of Amphibians and Reptiles for Translocation” are recommended.

³ Relocation and translocation should not be a first choice mitigation or compensation option to avoid land use impacts.

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