Clarifying Questions from the IRST to the AMPC
Regarding the Amphibians Questions Package

These clarifying questions were developed by the IRST at their May 8, 2025, meeting and represent questions compiled after discussion with all IRST members.

Question 1. For each of the covered amphibian species, what is the distribution (including genetics) within Oregon, and what factors (e.g., stream gradient, stream size, fish presence/absence, slope, aspect, temperature, seasonality, micro-habitat conditions) determine this distribution at a smaller spatial scale (e.g., watershed)?

Clarifying Questions:

A. **At what scale and resolution does the AMPC request information regarding species distributions of the 5 covered amphibians?** For example, range maps found in a field guide or mapping databases describe species' distributions at a coarse scale in the state of Oregon (e.g., the USGS National Amphibian Atlas; https://armi.usgs.gov/atlas/). **Is AMPC interested in a summary of these existing coarse-scale distributions, particularly as they identify where the periphery of their geographic ranges are in Oregon? Or, is AMPC interested in collecting data to validate/verify these previously established distributions? Is there a particular species that needs emphasis?**

AMPC Response:

The AMPC is interested in a literature review that describes the geographic distribution for all 5 species, verifying coarse scale distribution data and providing information on a watershed level 5 scale (to the extent such data is available). The AMPC would like this to be accompanied by description of the level of confidence in these distributions and the AMPC would like to identify any gaps in the data related to the distribution of the five species. The AMPC does not envision collecting field data on these distributions at this time.

B. **With regard to the phrase "including genetics," what specifically does the AMPC want to know about the genetic distribution of each covered amphibian species?** Conservation genetics can be considered a tool to develop ecological understanding. For example, the extent to which genetic material is transferred among individuals and populations may provide information on habitat connectivity. **At what spatial scale is this question being asked and what would be a desired deliverable? Is AMPC interested in learning how the populations of the 5 covered amphibian species are structured genetically across private forest lands - in other words, what is the relative amount of genetic variability within and among populations or sub-populations in Oregon?**

AMPC Response:

The AMPC wants to understand the genetic diversity to assess both the health of existing populations, and the degree of habitat interconnectivity (e.g., across watershed divides). The AMPC would like to confer with the IRST further on this point.

C. Various models have been or can be developed to describe how local-scale factors influence the presence, occupancy, or abundance of species at smaller spatial scales. Other models focus on habitat characteristics and can be utilized to predict habitat suitability (e.g., Habitat Suitability Indices). Versions of these models exist for some of the covered species. The IRST can review options for potential future model development and the existing models in the scoping proposal. However, to guide development of research options, **could the AMPC clarify whether they are interested in a predictive model of "occupancy" (where the species are found currently) or of "potentially suitable habitat (where environmental conditions are available that may support the species)?"**

AMPC Response:

The AMPC is not interested in a predictive model at this stage of the research. Instead, they want to understand the contributing factors that drive where they exist on the landscape, including associated habitat characteristics.

Question 2. What is the population trend of the Columbia and Southern torrent salamanders over time on lands subject to the Forest Practices Act (FPA) rules? This question is informed by the following overarching biological goal as stated in the draft PFA HCP: "Forest practices that support the survival and recovery of the covered species by providing clean, cool, connected, and complex habitats."

Clarifying Questions:

A. Does the AMPC want to improve understanding of how or if baseline (current, or pre-PFA) population abundances are changing through time (trends) as additional stream and riparian protections are applied? Or is the AMPC interested in summarizing any existing long-term sampling data for amphibians on private lands in Oregon that occurred prior to the PFA?

AMPC Response:

The AMPC wants the primary focus on this research to be the trend going forward. Data on previous population abundances are helpful as baseline information, especially to the extent that informs the trend going forward.

B. Are there any specific, broad-scale disturbances or factors that should be integrated into this research question, such as impacts of wildfire or climate change?

AMPC Response:

No, this research is more of a baseline assessment and not focusing on causal linkages related to disturbances. For context of this work, please see the excerpt of the PFA Report in Appendix 1.

Note: The Amphibians workgroup did not have time yet to address IRST questions related to Question 3 (below) and will work on it the fall of 2025.

Question 3. The following sub-questions are informed by direction from the PFA Report to "…better understand how riparian and unstable slope protections of at least the current and proposed rules for private forestland impact persistence of populations."

Question 3.1. How do rules for no-harvest RMAs affect Columbia and Southern torrent salamanders' habitat? BGO from Draft PFA HCP: Goal 2: Shade and watershed processes controlling stream temperature provide cool water compatible with the needs of the covered species. Objective 2.2 – No-harvest RMAs maintain stream shade sufficient to support desired cool water temperatures for covered amphibians. The most recent version of the BGOs is in the Dec. 2022 draft HCP. The BGOs will be finalized within the HCP due Dec. 31, 2027. Private Forest Accord Report, p. 121.

Clarifying Questions:

A. Is the AMPC interested in how the rules for no-harvest RMAs affect only stream shade and water temperatures related to the habitat requirements of the torrent salamanders? Or, is the AMPC interested in how the species respond (changes to populations, individuals, etc.) to changes in the habitat features of stream shade and water temperature as influenced by the rules for no-harvest RMAs? Other habitat factors may be identified as important to the torrent salamanders through answering Research Question 1 and also could be included in a scoping proposal. **In addition, could the AMPC identify the specific rules related to no-harvest RMAs that are of interest to the AMPC in this context?**

Question 3.2. How do rules for Type N streams affect Columbia and Southern torrent salamanders' habitat? BGO from Draft PFA HCP: Goal 3: Stream network connectivity satisfies freshwater habitat needs for covered species. Objective 3.3 – Timber harvest maintains stream-associated connectivity in riparian areas along non-fish streams sufficient to support covered amphibians.

Clarifying Questions:

A. **Is the AMPC interested in how the rules for Type N streams affect only connectivity of the stream network for Columbia and Southern torrent salamanders or also including other specific habitat features?** The habitat factors important to describing occupancy, abundance, or habitat suitability for Columbia and Southern torrent salamanders may be identified through answering Research Question 1. **And, is the AMPC interested in understanding how connectivity affects species' responses (changes to populations or individuals) in addition to habitat metrics? Finally, could the AMPC identify the specific rules related to Type N streams that are of interest to the AMPC in this context?**

Question 3.3. How do rules for steep/unstable slope protections affect Columbia and Southern torrent salamanders' habitat? BGO from Draft PFA HCP: Goal 4: Riparian areas function to support complex habitats for the covered species. Objective 4.3 – Designated Debris Flow Traversal Areas function to deliver large wood to fish-bearing streams. Objective 4.4 – Forest practices maintain stream-associated wetlands and stream-adjacent seep and spring habitat for amphibians.

Clarifying Questions

A. **Is the AMPC interested in improved understanding of these species' responses (changes to populations, individuals, etc.) to steep/unstable slope protection changes associated with the PFA, or to changes to specific habitat characteristics that are important to Columbia and Southern Torrent Salamanders, such as large wood that may be provided through debris flows?** Habitat factors important to describing occupancy, abundance, or habitat suitability for the torrent salamanders including large wood or presence of stream-associated wetlands, seeps, and springs, may be identified through answering Research Question 1. In addition, **could AMPC identify the specific rules related to steep/unstable slope protections that are of interest to the AMPC in this context?**

Appendix 1. Excerpt from the Private Forests Accord Report, Chapter 7 Amphibian Conservation

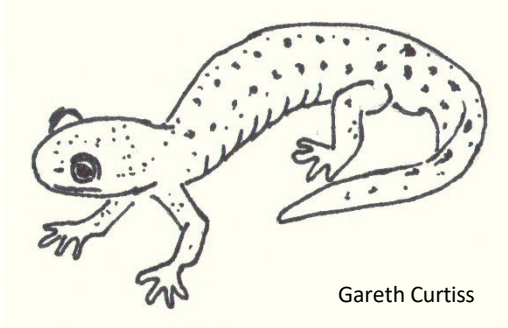
7.1 Introduction

The Authors were able to reach agreement regarding protections for five stream-dwelling amphibian species sufficient to support coverage under a Habitat Conservation Plan (HCP). These species are: Columbia torrent salamander (*Rhyacotriton kezeri*), Southern torrent salamander (*Rhyacotriton variegatus*), Coastal giant salamander (*Dicamptodon tenebrosus*), Cope's giant salamander (*Dicamptodon copei*), and Coastal tailed frog (*Ascaphus truei*). In Western Oregon forests, these species are stream-obligates during early development (eggs and larvae). Upon metamorphosis, they can occur in or along streams and use riparian and upland forests for foraging, dispersal, overwintering and aestivation.
However, in some cases, mature life forms of giant salamanders remain in streams for their entire lives ("neoteny").

At the time of the PFA agreements, these species had the following status:

- Columbia torrent salamander: Under review for listing under Federal Endangered Species Act, Oregon Sensitive, ORBIC 4, IUCN near threatened;
- Southern torrent salamander: Oregon Sensitive, ORBIC 4;
- Coastal giant salamander: No special status designations;
- Cope's giant salamander: Oregon Sensitive, Special Status/Sensitive Species; ORBIC 2 (Imperiled); and
- Coastal tailed frog: Oregon Sensitive, ORBIC 4.

The Authors considered issues related to riparian buffers, connectivity, roads, culverts, and water quality and temperature that informed the approach of this Chapter. The Authors also considered other approaches to protection of stream-dwelling amphibians, including the draft Western Oregon Forest Habitat Conservation Plan and the Washington Forest Practices Habitat Conservation Plan. This Chapter is not intended to be a comprehensive literature review of the variable response of amphibians to disturbance.


Gareth Curtiss

At watershed scales, stream-dwelling amphibian habitat includes streams that occur higher up in the stream network than federally protected fish species and therefore, protections and management approaches focused on fish are not necessarily sufficient to protect stream-dwelling amphibians.
Coastal giant salamanders and Coastal tailed frogs can co-occur in reaches with fish, but the entire assembly of stream-dwelling amphibians also frequently relies on non-fish-bearing headwater streams. As a result, specific strategies to avoid, minimize, or

mitigate impacts to stream-dwelling amphibians are largely absent under the current Oregon Forest Practices Act and related regulations.

Stream habitat for tailed frogs, torrent salamanders, and giant salamanders includes cool, clear surface water flow with instream microhabitat complexity, such as coarse stream substrates with interstitial spaces. Yet, the heterogeneity of small headwater streams warrants recognition relative to these species' occurrences. More specifically, Coastal tailed frogs and Coastal giant salamanders are more often associated with perennial stream reaches with larger substrates and more down wood, and torrent salamanders have been found in smaller waters with smaller substrates, less down wood, and spatially intermittent streamflow patterns (Olson and Weaver, 2007; Thompson et al., 2018).
After larval metamorphosis, many stream-breeding amphibians also are found within upland forests and have been trapped to 400 meters upslope of streams (Olson et al., 2007). The Authors have differing opinions regarding the conclusion that genetic analyses documented broader landscape- scale dispersal patterns in the following studies (Coastal tailed frog recolonization of Mount St.
Helens post-eruption: Spear et al., 2012; torrent salamanders in the Oregon Coast Range: Emel et al., 2019).

Stream-dwelling amphibians are also found within upland forests of the Pacific Northwest, with older-forest associations of these species supporting risks of historical forest management practices (Blaustein et al., 1995). For example, Pollett et al. (2010) found Coastal tailed frog and Cascade torrent salamander densities were 2-7 times lower in streams within managed forests than in streams in unharvested forests.

There is often variability in responses of stream-dwelling amphibians to disturbance. Existing uncertainties around responses of stream-dwelling amphibians to the collective disturbances associated with forest management prescriptions in Oregon is confounded by the variability in the contexts of individual studies, including a lack of studies that explicitly test contemporary treatments while controlling for high variability in landscape and site conditions (Schmidt and Garroway, 2021; Martin et al., 2021). Martin et al. (2021) evaluated the relationship between riparian buffering regimes, stream temperatures, and stream-associated amphibians and found no evidence to support that abundance of amphibian populations are positively correlated with larger buffers.

Due to the late publication of Olson and Ares (2022) during the course of the negotiations, not all of the Authors were able to review and evaluate this work. In a western Oregon study initiated in 1994 with a before-after-control-impact design across 8 sites and 54 stream reaches, Olson and Ares (2022) reported support for decadal lag-time effects on stream amphibians of buffer widths with upland thinning. Both Coastal giant salamanders and torrent salamanders were found in higher densities in streams with a one potential-tree height riparian buffer compared to narrower buffers, and torrent salamanders had associations with streams in unthinned control units as well.

In a western Oregon study, Olson and Burton (2014) reported reduced densities of *Rhyacotriton spp.* in stream reaches with the narrowest buffer they examined (6 m

wide on each side of streams) with two sequential entries of upland secondary-forest thinning. The Authors have differing opinions on the conclusion that the data in this study supported the use of the wider buffers that they examined in their study, a minimum of 15 m wide on each side of streams, to retain sensitive headwater stream amphibians.

In a second comprehensive before-after-control-impact (BACI) study of riparian buffers in hard rock lithology in western Washington, McIntyre et al. (2021) found riparian buffers adjacent to non-fish-bearing perennial stream buffers of second growth timber were important for tailed frogs, but no demographic effects were found for torrent and giant salamanders. This study emphasizes the importance of reviewing changes to salamander populations over an extended time period, as impacts may not manifest in the years immediately following harvest.

However, when genetic analysis was applied over the same time period, evidence was not found for any population level effects for Coastal tailed frogs or any amphibian species following the harvest prescriptions (Spear et al., 2019). Though interpretations of these results differ, these results support the fact that there is often variability in responses of amphibians to disturbance (Schmidt and Garroway, 2021) and the different response parameters and their time elements may warrant consideration.

The uncertainties surrounding amphibian population characteristics, distribution, productivity, survival, and abundance, as well as the variable response of amphibians to disturbance informed the approach of the Authors established in this Report. These uncertainties underpin the decision to prioritize research under the adaptive management process to ensure that the efficacy of protection strategies will be evaluated and adjusted as needed in a timely manner.