



# Climate Change Vulnerability Assessment in the Upper Snake River Watershed

## Columbia Spotted Frog

MORE WARMING

Low Vulnerability

Medium Vulnerability

High Vulnerability

**EXTREME VULNERABILITY**

LESS WARMING

Low Vulnerability

Medium Vulnerability

**HIGH VULNERABILITY**

Extreme Vulnerability

Results above highlight **Columbia spotted frog climate change vulnerability in the 2050s** for two different climate change scenarios. The higher climate change scenario (RCP 8.5) is labeled “More Warming” and the lower climate change scenario (RCP 4.5) is labeled “Less Warming”. Generally, more greenhouse gas emissions over a longer time will lead to more severe impacts from climate change.

Relative vulnerability rankings were determined by combining the best available climate change science with the local and traditional knowledge of the Upper Snake River Tribes (USRT) Foundation’s four member tribes. These rankings are based on climate change projections, species-specific sensitivities, and the ability of species to adapt and respond to the projected changes.

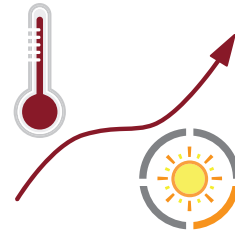
### Columbia Spotted Frog and the USRT Member Tribes

USRT member tribes have reported a decrease in amphibian abundance. The Columbia spotted frog depends on both low and high elevation riparian habitats. These habitats are affected by the presence of beavers and overall groundwater availability, which has been decreasing in some agricultural areas due to high withdrawals. Columbia spotted frogs also use springs and seeps and are sensitive to similar reductions in water availability and water flow in these habitats.

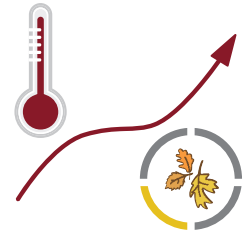


## Key Climate Impacts

By the 2050s, climate change in the region is projected to increase maximum summer temperatures 6.5° to 8.5° Fahrenheit and maximum fall temperatures 5° to 7° Fahrenheit. Precipitation regimes may shift slightly, increasing winter, spring, and fall precipitation. Increasing summer temperatures will evaporate more water and warm streams. These shifts have the potential to decrease overall water availability.



Maximum summer temperatures are projected to increase 6.5°F to 8.5°F.



Maximum fall temperatures are projected to increase 5°F to 7°F.

## Columbia Spotted Frog have:

factors that “**increase**” vulnerability

### **Dependence on aquatic habitats**

The Columbia spotted frog is found in the shallow portions of lakes, ponds, marshes, and streams. Increasing summer temperatures and evaporation may alter the presence or suitability of these environments.

### **Sensitivity to disease and predators**

Climate change could intensify the effects of diseases and parasites, such as chytrid fungus and trematodes, on the Columbia spotted frog. Cutthroat trout and rainbow trout prey on Columbia spotted frog tadpoles and juveniles. They will be able to move farther up rivers and streams with warming water temperatures, thus increasing predatory pressure on frogs in these areas.

### **Low genetic variability**

Columbia spotted frog populations in Oregon have been found to be genetically isolated, with low levels of variation. This decreases their ability to adapt to changing environmental conditions and can increase the likelihood of local population extinction.

factors that “**somewhat increase**” vulnerability

### **Limited dispersal abilities**

The average female typically moves less than 500 meters between breeding and summer sites. This limited movement will likely restrict the Columbia spotted frog’s ability to migrate as climate change alters habitat conditions.

### **Natural and man-made barriers**

Roads and other human modifications of the landscape, along with large expanses of landscape without water, can act as a barrier to migration and increase mortality for Columbia spotted frogs that attempt to cross these barriers.



Photo by: Kate Brady

These are select results of a more comprehensive climate change vulnerability assessment developed collaboratively by the Upper Snake River Tribes Foundation, Burns Paiute Tribe, Fort McDermitt Paiute-Shoshone Tribe, Shoshone-Bannock Tribes, Shoshone-Paiute Tribes, Adaptation International, the University of Washington Climate Impacts Group, and Oregon Climate Change Research Institute.

For more information on this assessment or to get involved, visit: [www.uppernakerivertribes.org/climate](http://www.uppernakerivertribes.org/climate) or contact Scott Hauser, Executive Director, USRT at [scott.hauser@usrf.org](mailto:scott.hauser@usrf.org).