



## Sierra Nevada Yellow-legged Frog (*Rana sierrae*)

### What is the status of Sierra Nevada yellow-legged frogs and why are they important?

The Sierra Nevada yellow-legged frog is endemic to the central and northern Sierra Nevada of California, including Yosemite, where it inhabits higher elevation lakes and streams.

These frogs were once the most abundant amphibian in high mountain lakes in the Sierra Nevada. A person walking the shore of one of many lakes would encounter hundreds of frogs that would leap from the shore, splashing into the water and swimming strongly away.



Today, the frog is one of the most critically endangered amphibians in North America, having disappeared from more than 95% of their historic sites. Because of these declines, the frog is listed as a Threatened species under the California Endangered Species Act and is proposed as Endangered under the U.S. Endangered Species Act, with a decision likely in fall 2014.

The ecological effects of the loss of the species from most of its range have been tremendous. In their former abundance, frogs were a vital link in energy and nutrient cycling in both the aquatic and neighboring terrestrial ecosystems—they are top predators feeding primarily on insects and they are an important prey for native birds, snakes, and mammals.

---

### What is causing their decline?

The primary factors implicated in the decline of the frog are the introduction of non-native fish into a majority of lakes and streams in the Sierra Nevada, and the recently-discovered amphibian chytrid fungus.

The impacts of non-native fish on high elevation aquatic and adjacent terrestrial ecosystems are well documented and occur at all levels of the food web. For example, fish prey on all life stages of the frog and compete with the frogs for food resources.

The diversity of species native to the park's high elevation aquatic ecosystems evolved over thousands of years in and around waters containing no fish. This is because fish were naturally restricted to the lower reaches of the Merced and Tuolumne Rivers by the grand waterfalls which Yosemite is famous for.

Stocking of non-native fish in Yosemite began in the 1870s and continued through 1990. Although stocking no longer occurs, many non-native fish populations continue to persist.

The recently-discovered amphibian chytrid fungus, *Batrachochytrium dendrobatidis* has been spreading across the Sierra Nevada since the 1970s, causing the extinction of hundreds of frog populations. Studies indicate that the fungus is not native to the Sierra Nevada. The fungus has infected nearly all frog populations, including those in Yosemite.

These factors, as well as other possible causes of amphibian declines, such as habitat loss, airborne contaminants, and climate change, are the subjects of ongoing research.

---

## Is there hope?

Despite widespread occurrence of the chytrid fungus among frog populations and observation of chytridiomycosis (the disease resulting from infection with the fungus) often being fatal, some populations in the Sierra Nevada are persisting and reproducing. There are a small number of these sites in Yosemite, and researchers are trying to determine why these populations have been able to expand to grow to include hundreds of individuals.

## What is Yosemite doing to protect and restore the frog?



All lakes, ponds, and marshes were surveyed for frogs between 2000 and 2002. These surveys were conducted to determine the current status and distribution of the frogs in the Park and to better understand the impacts of non-native fish on these systems. Follow-up surveys were conducted from 2005-2007 and again in 2012. Existing populations continue to be monitored.

The Yosemite Conservancy supported an effort to reintroduce frogs into three fishless lakes in 2006. Two additional lakes were added in 2008 and two more were added in 2013. These reintroductions are part of a Sierra-wide research effort to better understand under what conditions frog populations may be able to reestablish and persist even with the chytrid fungus. This research is also supported by a grant from the National Science Foundation.

Entrance fee funds are supporting an experimental effort to remove non-native fish from a small number of sites for the benefit of amphibians, snakes, birds, bats, and insects that depend on fish-free habitat. These restoration projects began in 2007 and use gill nets and electroshockers to remove fish (not chemicals).

The results of these research projects will help park staff develop strategies for recovering and protecting the frogs and their associated ecosystems.

## How can I learn more and become involved?

The National Park Service is preparing the High Elevation Aquatic Ecosystem Recovery and Stewardship Plan and Environmental Assessment to guide how Yosemite will protect the park's diverse high-elevation aquatic ecosystems into the future. The plan will address future actions that may be needed to restore native species, habitats and systems that have been disturbed by past or ongoing human activities. Here are ways to learn more about this plan and stay involved:

- **Attend a monthly Yosemite National Park Open House** to talk with Park staff and obtain more information on this and other planning process:
  - Open House: generally the last Wednesday of each month in the Yosemite Valley Visitor Center Auditorium from 1:00-5:00pm
- **Add your name to the park's planning list** and receive the *Planning Update* or **submit your email address** to receive the park's periodic electronic newsletter online at [www.nps.gov/yose/parkmgmt/updates.htm](http://www.nps.gov/yose/parkmgmt/updates.htm).
- **The Environmental Assessment will be open to public review in the future.** To request notification about the plan's availability for review  
**Mail:** Superintendent  
*Attn: High Elevation Aquatic Resources Management Plan*  
P.O. Box 577  
Yosemite, CA 95389  
**Phone:** 209/379-1365; **Fax:** 209/379-1294  
**E-mail:** [Yose\\_Planning@nps.gov](mailto:Yose_Planning@nps.gov)
- **Visit online:** [www.nps.gov/yose/parkmgmt/aquatic.htm](http://www.nps.gov/yose/parkmgmt/aquatic.htm)