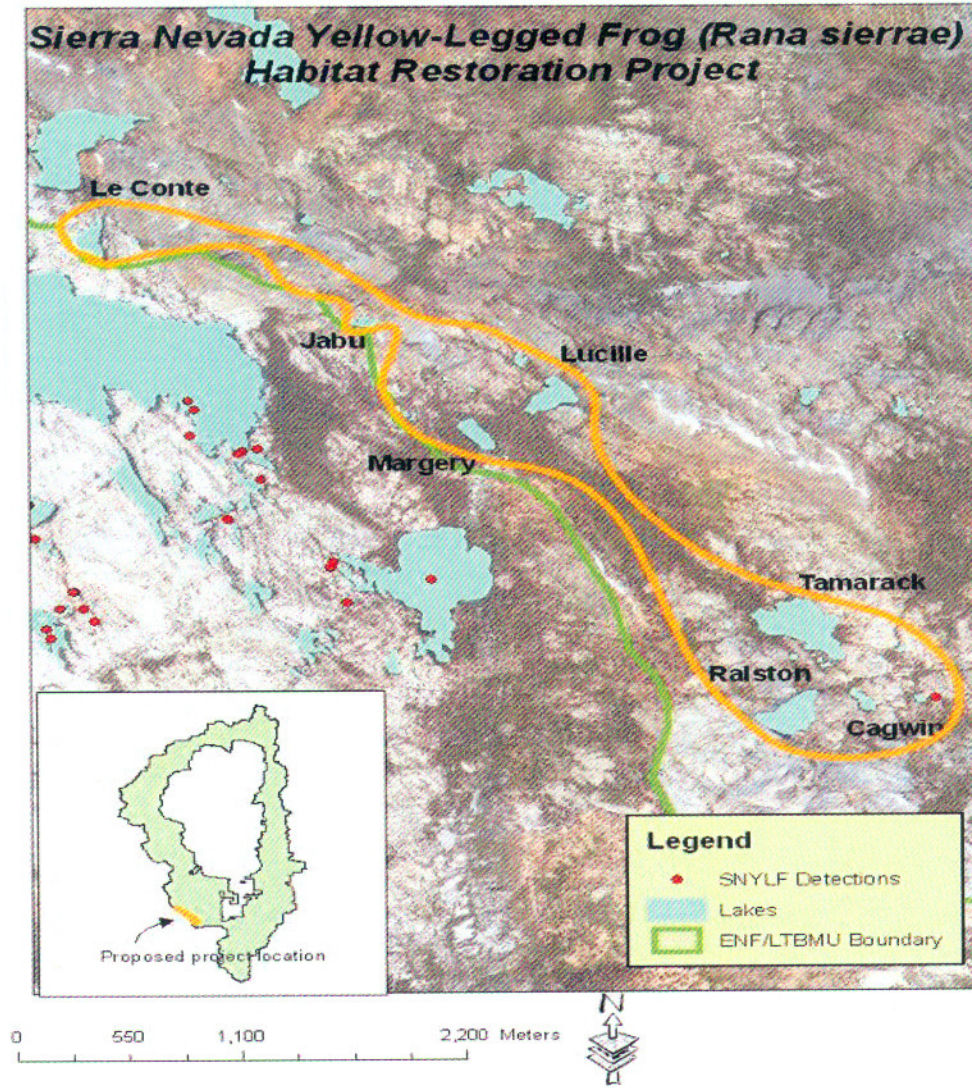




Sierra Nevada Yellow-Legged Frog Restoration Project Proposal

The proposed project is located in El Dorado County, California within a series of seven high alpine lakes that are all within the Desolation Wilderness, a congressionally designated management area. The identified lakes include Tamarack, Cagwin, Ralston, Lucille, Margery, Jabu, and LeConte (T12N R16E and R17E). A total of 69 lake acres and 3 miles of stream are proposed for habitat restoration during the course of this project.



Proposed Action:

The USFS Lake Tahoe Basin Management Unit proposes to restore ecological conditions for native aquatic species to seven lakes in Desolation Wilderness. The proposed actions would allow re-colonization of native species, specifically Sierra Nevada yellow-legged frog (*Rana sierrae*), either naturally or through further management actions. The seven selected lakes were chosen due to their proximity to an existing population of *R. sierrae* and therefore offer the greatest opportunity for population expansion in Desolation Wilderness. A similar effort removing fish on the El Dorado National Forest began in 2007 in Desolation Wilderness on lakes adjacent to the project area.

The proposed project includes the following actions:

- Manual removal of introduced, non-native fish using monofilament gillnets in Tamarack, Ralston, Cagwin, Lucille, Margery, Jabu, and Le Conte lakes and associated ponds. All proposed lakes have been identified by the California Department of Fish and Game as Native Species Restoration Lakes, Category 1 (restoration feasible and no public use concern) or 2 (restoration feasible and some public use concern). Nets will be left in the lakes over winter and re-visited the following season. No chemicals will be used during the course of this project. It is projected that it will take three to five years to eradicate the introduced brook trout and rainbow trout from each lake and its associated streams. The proposed project will be implemented over the course of 10 years (Table 2), to ensure introduced trout are eradicated from all seven lakes in the project area.

Table 2. The proposed treatment schedule for the seven lakes in the Desolation Wilderness, LTBMU.

Lake Name	Begin Implementation	Expected Completion Date
Ralston	2008	2011
Tamarack	2009	2012
Cagwin	2009	2012
Margery	2012	2015
Lucille	2012	2015
Le Conte	2015	2018
Jabu	2015	2018

- Manual removal of introduced, non-native fish using a backpack electroshocker in all inlet and outlet streams, to the closest upstream and downstream fish barrier, associated with proposed lakes and ponds. Barriers are considered falls >0.75 m high if there is no pool at the base, falls >1.5 m if there is a pool at the base, or steep cascades higher than approximately 1.5 m. Approximately three miles of streams will be treated. No chemicals will be used during the course of this project.

The proposed action is consistent with California Department of Fish and Game goals and objectives for recovering and developing waters for native amphibians, as outlined in the 2008 Desolation Fish Management Plan. The proposed action is consistent with the International Association of Fish and Wildlife Agencies, "Policies and Guidelines for Fish and Wildlife in

National Forest and Bureau of Land Management Wilderness”, which states management activities will emphasize the protection of natural processes. The proposed action is also consistent with the Tahoe Regional Planning Agency’s Wildlife Threshold W2, which states: “A no degradation standard shall apply to significant wildlife habitat consisting of deciduous trees, wetlands, and meadows while providing for opportunities to increase the acreage of such riparian associations.”

Purpose and Need for the Proposed Project:

There is a need to manually remove non-native salmonid fish from high mountain lakes in Desolation Wilderness that have been identified by the California Department of Fish and Game as Native Species Restoration Lakes, Category 1 and 2. The proposed lakes will be managed and monitored for native species and will no longer be stocked with salmonid fish, native or non-native. The proposed action will restore 69 acres of lake and 3 miles of stream habitat for the *R. sierrae*, a candidate species for listing under the Endangered Species Act (ESA). Because this species has been extirpated from over 90% of their historic habitat, there is a multi-agency perspective for the need to recover the species range and prevent its federal listing on the ESA.

Predation by introduced fish is one of the best-documented causes of the decline of *R. sierrae* in the Sierra Nevada. The decline in frog populations has resulted in the need to restore this habitat while a source population still exists adjacent to the proposed project area. Populations extirpated or reduced as a result of fish introduction can recover to pre-disturbance after fish are removed. Recovery of frog populations following fish removal has been documented in the Sierra Nevada (Vredenburg 2004, Knapp et al. 2007) and indicates that manual fish removal, as a management action, can be successfully implemented. Prior to the 1950s conditions of alpine lakes in Desolation Wilderness were fishless and supported viable populations of *R. sierrae*. Although no stocking has occurred in at least eight years for the majority of the project lakes, there is a need to assist in the recovery of *R. sierrae* habitat by removing an undesired predator and competitor (Table 1).

Table 1. Project Area Stocking Record, Desolation Wilderness, LTBMU.

Waterbody	Initial Stock Year	Final Stock Year	Species Stocked
Cagwin Lake	1950	1999	Rainbow Trout
Lake Lucille	1950	1974	Brook Trout
Margery Lake	1950	2000	Brook/Rainbow Trout
Ralston Lake	1950	2000	Rainbow/Brook Trout
Tamarack Lake	1950	2000	Brook/Rainbow Trout
LeConte Lake	1951	1999	Brook/Rainbow Trout
Jabu Lake	1962	2000	Brook/Golden Trout

R. sierrae have a long larval stage, which requires the use of perennial waters for up to four years to complete metamorphosis cycle. This requirement, in combination with the highly aquatic adult stage, leaves this species especially vulnerable to aquatic predators (Bradford et al. 1993).

Historic collections and accounts indicate that *R. sierrae* were relatively abundant throughout the Lake Tahoe Basin. Currently within the Lake Tahoe Basin, *R. sierrae* have been documented in Cagwin Pond (adjacent to Cagwin Lake in Desolation Wilderness) and Hell Hole (located in the headwaters of Trout Creek). A substantial source population, however, is located in lakes in Desolation Wilderness located on the Eldorado National Forest and in close proximity to LTBMU lakes and streams (refer to attached map).

Last year, the Eldorado National Forest began recovery efforts (fish removal) on three lakes, Waca, Pyramid, and Gefo Lakes. Recent documentation (Knapp et al. 2007) of the rapid re-colonization of MYLF into newly restored fishless lakes and ponds suggests that once fish are removed from the seven suitable lakes and stream habitats on the LTBMU, *R. sierrae* populations from the Eldorado National Forest will also disperse and re-colonize into the newly formed suitable habitat, thus increasing the abundance of *R. sierrae* in the Desolation Wilderness and allowing for future re-colonization and population dispersal.

Although fishing opportunities will be eliminated in lakes identified as Habitat Restoration Lakes, other lakes in Desolation have been identified as Recreational Fishing Lakes. These lakes will have continued stocking efforts in the future to provide for recreational fishing. More information regarding these lakes can be obtained by contacting the California Department of Fish and Game Office.

Literature Cited:

- ▶ Knapp, R.A., D.M. Boiano, and V.T. Vredenburg. 2007. Recovery of a declining amphibian (mountain yellow-legged frog, *Rana muscosa*) following removal of nonnative fish. *Biological Conservation* 135: 11-20.
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