Restoration of Native Species in High Elevation Aquatic Ecosystems Plan and Draft Environmental Impact Statement

Frequently Asked Questions

National Park Service
U.S. Department of the Interior

Sequoia and Kings Canyon
National Parks

What is the purpose of the Restoration Plan?
The purpose of the plan is to restore a portion of the high elevation aquatic ecosystems in Sequoia and Kings Canyon National Parks to natural conditions. This would be done by removing nonnative trout from up to 87 remote high elevation lakes, ponds, and marshes, and 41 miles (66 km) of streams, to allow for native species and ecosystems to flourish and function naturally. This work would be done to increase the resistance and resilience of native species to disease and unprecedented changing climatic conditions.

When were nonnative fish stocked, and does fish stocking still occur in the parks?
High elevation lakes in Sequoia and Kings Canyon National Parks were historically fishless. Nonnative trout were introduced to hundreds of high elevation lakes from 1870 to 1988 to draw recreationists and tourists to the area. Stocking was discontinued in 1988 by National Park Service policy.

How many lakes and streams have nonnative trout in them now?
There are approximately 549 high elevation lakes, ponds, and marshes within the parks that contain nonnative trout. Although the parks do not have survey data on nonnative trout populations in many high elevation streams, fish are assumed to be present in most streams. The sites are located in remote settings, and the majority of sites are inaccessible (i.e., by established recreation trails).

How many lakes, ponds, marshes, and streams would be affected by the project?
If the management preferred alternative is selected, nonnative trout would be removed from 32 lakes, 50 ponds, and 5 marshes, or 16% of the parks' lakes, ponds, and marshes that contain nonnative trout. Nonnative trout would also be removed from approximately 41 miles (66 km) of streams, which represents 1% or less of fish populations in park streams. Nonnative trout would remain in 462 lakes, ponds, and marshes.

Will I still be able to fish in the parks?
Sequoia and Kings Canyon National Parks offers outstanding fishing opportunities suited to a variety of interests and abilities. Fishing is a welcomed and popular form of recreation and will continue to be available and promoted throughout the parks. Lakes, ponds, and marshes proposed for trout removal in this project were selected to avoid most lakes with a reputation for good fishing.

Does this project include closures to recreational activities or access by hikers or stock users?
The Restoration Plan **does not** propose to permanently close areas to recreational activities or access by hikers or stock users. There would be short-term closures (3 to 7 days) associated with each piscicide treatment, if one of the action alternatives that includes piscicide use is selected.

How would this project affect area businesses?
This project would have little to no impacts on area businesses. The number of visitors accessing the parks for fishing is not expected to decrease, and the number of lakes available for recreational fishing would remain plentiful. A total of 462 lakes, ponds, and marshes, including the majority of "destination" areas, would still be available for public use. Therefore, the number of visitors accessing the parks for fishing is not expected to decrease.

Why are you proposing to take action now when fish were stocked in these areas beginning in the late 1800s?
Recent studies have shown that the widespread introduction and continued presence of nonnative trout causes substantial, cascading impacts to native species and entire ecosystems by reducing biological diversity and disrupting healthy ecosystems. Primarily affected are two species of yellow-legged frogs, *Rana muscosa* and *Rana sierrae*, which are proposed for listing under the Endangered Species Act due to effects from nonnative trout and disease (amphibian chytrid fungus). Extensive research has demonstrated that when nonnative fish are removed from lakes, native species (including yellow-legged frogs, aquatic invertebrates, and zooplankton) quickly recover.

How successful is removal of nonnative fish in restoring native species?
Sequoia and Kings Canyon National Parks began eradicating nonnative trout from selected lakes in 2001. By 2010, fish were eradicated from eight lakes and nearly eradicated from three lakes, and yellow-legged frogs in nine of these lakes remained disease-free 3 years after fish removal. During this time, average yellow-legged frog tadpole density in these nine lakes increased by 13-fold, while average yellow-legged frog density increased by 14-fold. One lake showed an overall 49-fold increase in yellow-legged frogs. Two of the restored yellow-legged frog populations are now the largest in the Sierra Nevada.

Isn't disease (amphibian chytrid fungus) the primary cause of the yellow-legged frogs' decline? Shouldn't you focus on managing this disease instead of removing fish?
Extensive research since the 1980s in the Sierra Nevada, including in Sequoia and Kings Canyon National Parks, has identified two primary factors for the decline of yellow-legged frogs:

1. Nonnative trout prey on yellow-legged frogs and compete with them for food. In addition, trout restrict the frogs to marginal, shallow habitat, and fragment populations.
2. Chytrid fungus, a recently discovered pathogen, causes a highly infectious disease (chytridiomycosis) in many amphibian species including yellow-legged frogs. Studies indicate the fungus has spread into the Sierra Nevada and has infected nearly all yellow-legged frog populations.

Chytrid fungus is a major factor in accelerating the decline of already stressed populations of yellow-legged frogs throughout the Sierra Nevada. We are working with scientists to conduct experimental treatments using antifungal agents on yellow-legged frogs to promote disease resistance. Unfortunately, treatment of the disease alone won't restore the yellow-legged frogs. The adverse impacts that nonnative trout have on frog habitat and breeding must also be addressed.

What types of methods are being proposed?
The management preferred alternative proposes to eradicate nonnative fish using gill nets, backpack electrofishers, shovels (to disturb fish egg nests), fish traps, and piscicides. Physical treatments would be used where feasible. Piscicide treatment methods include applying extremely low concentrations of the CFT Legumine® formulation of rotenone to lakes and streams and would be used only where physical methods are infeasible.

How would the proposed use of piscicides affect other species?
CFT Legumine® is toxic to trout at extremely low concentrations. It can also be toxic to other gill-breathing organisms including aquatic invertebrates, zooplankton and tadpoles. Effects on tadpoles would be mitigated by moving tadpoles to adjacent habitat outside the treatment area. Aquatic invertebrate and zooplankton populations would be reduced immediately after treatment. Studies have shown that most species typically return to pre-treatment levels within 1 year, while a few species take longer (3 to 5 years) to return to pre-treatment levels.

How long will a lake or stream be affected by piscicides?
There would be short-term impacts to surface water quality. Depending on environmental conditions (solar exposure, lake depth, wind, pH, etc.), most of the chemicals would break down in several days to several weeks. Piscicides applied to stream water would be neutralized at the lower end of the treatment site using potassium permanganate.

Will the use of piscicides affect drinking water?
Human consumption of water within treatment areas and approximately ½ mile downstream of the rotenone neutralization station would be restricted during treatment and for 3 to 7 days after treatment, in accordance with EPA rotenone label guidelines. Any compounds that remain in the water at the downstream end of a treatment area are neutralized using potassium permanganate, thus there would be no long-term negative effects on water quality. Piscicide treatments would not affect groundwater.

Is this project related to the U.S. Fish and Wildlife Service's proposed designation of critical habitat or proposed listing of the yellow-legged frogs and Yosemite toad as threatened or endangered species?
The project is not directly related to the proposed listing, but if an action alternative is successfully implemented, the activity would help restore yellow-legged frog populations in the long-term, and thus contribute to their overall recovery. The actions proposed within the Restoration Plan/Draft Environmental Impact Statement are also consistent with the draft multi-agency conservation strategy for yellow-legged frogs being developed by the U.S. Fish and Wildlife Service.

Has climate change been considered in the project alternatives?
This Restoration Plan/Draft Environmental Impact Statement is aligned with the NPS Climate Change Response Program - Natural Resource Adaptation Strategy and enhances all of the elements identified in the strategy to make natural systems more resilient to climate change.

Are the proposed actions allowed in wilderness?
The proposed actions have been assessed and determined to be the minimum necessary for the protection of the natural quality of wilderness character. Although the proposed action would also impact some qualities of wilderness character (undeveloped, untrammeled, and opportunities for solitude), the overall impact on wilderness character in the long-term would be beneficial.

Why not let nature takes its course without interference?
Management of National Park Service lands is founded on policies that strive to conserve resources in as natural a state as possible. Nonnative trout are not a natural part of Sequoia and Kings Canyon National Parks' high elevation aquatic ecosystems. Their presence causes substantial long-term adverse impacts to native species and ecosystem integrity. NPS *Management Policies 2006* guides parks to remove nonnative species and restore native species and naturally functioning ecosystems when feasible. This Restoration Plan/DEIS proposes actions demonstrated to be successful in restoring high elevation aquatic ecosystems.

What is the estimated cost of this project?
The cost for the preliminary project work conducted since 2001 averaged approximately $125,000 per year. If the management preferred alternative is selected, considering inflation for the implementation period (25 to 35 years), the average project costs would increase to approximately $200,000 per year.

Where do I find more information, and how can I make comments?
For more information, including the complete Restoration Plan and Draft Environmental Impact Statement, visit the National Park Service's Public Comment and Environmental Compliance website at http://parkplanning.nps.gov/projectHome.cfm?projectID=17157.

Comments may be made:

- On PEPC at: http://parkplanning.nps.gov/projectHome.cfm?projectID=17157
- Via mail or by hand-delivering your written comments to: Superintendent, ATTN: Aquatic Ecosystems Restoration Plan/DEIS, 47050 Generals Highway, Three Rivers, CA 93271
- Via fax to: 559-565-4202
- Since electronic comments are being accepted through the PEPC website, comments will not be accepted by e-mail.