

# **RECORD OF DECISION**

## **Sequoia and Kings Canyon National Parks Restoration of Native Species in High Elevation Aquatic Ecosystems Plan and Environmental Impact Statement**

### **INTRODUCTION**

The Department of the Interior, National Park Service (NPS) has prepared this Record of Decision (ROD) on the Restoration of Native Species in High Elevation Aquatic Ecosystems Plan and Final Environmental Impact Statement (Restoration Plan/FEIS) for Sequoia and Kings Canyon National Parks (SEKI or the parks). This ROD includes a description of the selected action, the basis for decision, synopses of other alternatives considered, the identification of the environmentally preferable alternative, and an overview of public involvement and coordination with other agencies in the decision-making process. Figures that are referenced in the ROD are available in the Restoration Plan/FEIS; a description of measures that will be implemented to minimize or avoid environmental harm are included as attachment A; and the park manager's determination of non-impairment, as required by NPS *Management Policies 2006*, is included as attachment B. References for citations included in the ROD and for attachments are provided in the Restoration Plan/FEIS.

### **BACKGROUND**

Historically, the parks' high elevation waterbodies were inhabited by a diverse assemblage of aquatic species that developed over thousands of years in a fishless environment. Stocking of nonnative trout into the parks' fishless high elevation waterbodies occurred as early as 1870, and continued until 1988 when the NPS terminated all fish stocking. Although stocking no longer occurs in the parks, as a result of stocking, nonnative fish have self-sustaining populations in approximately 575 waterbodies and in hundreds of miles of streams within SEKI.

Many studies conducted in SEKI and elsewhere in the Sierra Nevada have analyzed the effects that nonnative trout have on native species and ecosystems. These studies consistently find that the widespread introduction and continued presence of nonnative trout have caused substantial impacts to native species and ecosystems. Because nonnative trout are efficient predators and competitors, their introduction results in modifications to native food webs. They prey on large organisms, such as amphibians and large-bodied aquatic insects and zooplankton, and alter, deplete, or eliminate populations of these animals from naturally fishless habitats. The animals that are consumed by nonnative trout occupy the middle of native food webs, functioning as both prey and predators. Their reductions as prey result in less food being available to native predators, such as snakes, birds, and mammals, in turn altering the distribution and abundance of these animals. Their reductions as predators affect the roles of herbivores and detritivores and associated nutrient cycling. When extirpations occur, all ecosystem functions associated with the species are lost. Thus, the presence of nonnative trout has negative, cascading effects on entire ecosystems, and their presence in individual lakes, connecting streams, and entire lake basins in SEKI continues to cause negative impacts on native species and ecosystem processes. These impacts are replicated on a landscape scale across a large portion of the parks' high elevation lands.

Integral to SEKI's high elevation aquatic ecosystems are two species of mountain yellow-legged frogs (*Rana muscosa* and *Rana sierrae*, collectively referred to as MYLFs). Formerly abundant, MYLFs are today among the world's most endangered amphibians: over 92% of their populations in the Sierra Nevada have disappeared, and most of the remaining populations are much smaller and more isolated than they were historically (Vredenburg et al. 2007). Extensive research has identified two primary factors for this decline. The first factor is the introduction of nonnative trout. Nonnative trout have several direct effects on MYLFs, including predation, competition for food, restriction of breeding to marginal habitat, and fragmentation of remaining populations (Bradford et al. 1993, Knapp and Matthews 2000, Vredenburg 2004, Finlay and Vredenburg 2007). The second factor is the recent spread of chytridiomycosis, a disease caused by amphibian chytrid fungus (*Batrachochytrium dendrobatidis*), which has infected and imperiled most remaining MYLF populations (Rachowicz et al. 2006, Vredenburg et al. 2010A). A third emerging factor is global climate change, which has begun to dry up smaller, shallower ponds in SEKI (Lacan et al. 2008). Ponds have become important habitat for MYLFs because, in basins where nonnative trout occur, fish occupy most of the larger lakes, which are more resistant to climate change. This has restricted many MYLF populations to smaller waterbodies that are more vulnerable to drought and warming (Lacan et al. 2008, Ryan et al. 2014).

Recent studies indicate that both MYLF species are continuing to decline and are on trajectories toward extinction (Knapp et al. 2011). As a result, in April 2014 both species were listed as endangered (FE) under the Endangered Species Act. SEKI is the only park that contains both species of MYLFs, making it a core zone for their restoration, recovery, and conservation.

The MYLFs' decline has had cascading negative consequences to high elevation ecosystems across the Sierra Nevada. Because of the historic abundance of MYLFs (Grinnell and Storer 1924), frogs were important contributors to energy and nutrient cycling in aquatic and adjacent terrestrial ecosystems. Eradicating nonnative fish from high quality MYLF habitat and restoring MYLF populations to selected locations where they have been extirpated would also help to restore and protect an integral component of healthy high Sierra native ecosystems (Knapp et al. 2001).

To address the decline of the MYLFs, from 1997 to 1999, researchers experimentally used gill nets to remove nonnative trout from two of the parks' waterbodies (Vredenburg 2004), and in 2001, SEKI began to implement preliminary restoration of MYLFs (NPS 2001). The primary goal of these efforts was to assess the use of physical tools (e.g., gill nets and electrofishers) to eradicate nonnative fish from selected lakes and associated streams in order to restore aquatic habitat and improve the status of declining MYLFs. From 2001 to 2013, SEKI removed 50,201 fish from targeted lakes and streams (NPS 2015A, NPS unpublished data). By 2015, SEKI restored 15 lakes and ponds and nearly finished restoring 10 lakes and ponds by eradicating nonnative fish. Fish eradication using physical tools has been determined to be feasible and beneficial for native species (Vredenburg 2004, Knapp et al. 2007, NPS 2012A); however, eradication using physical tools is only feasible in relatively simple (non-complex) habitat: generally lakes with few and/or small connected stream sections. Some of the remaining potential restoration areas in SEKI that have value for addressing ecosystem recovery contain much more complex habitat involving large lakes or clusters of many lakes with many and/or large connected streams. Many of these areas also contain large, deep and/or cold lakes that have the best capacity to resist drier and warmer conditions expected in the future due to global climate change.

To broaden the types of lakes that can be restored, the NPS proposes to expand the current program, both in the number of waterbodies to be restored and the types of treatment methods to be used. The plan evaluates alternatives for expanding restoration efforts to more complex aquatic ecosystems using physical methods and/or piscicides (rotenone).

## **PURPOSE AND NEED**

The purpose of this Restoration Plan/FEIS is to guide management actions by the NPS to restore and conserve the native species diversity and ecological function of selected high elevation aquatic ecosystems that have been adversely impacted by human activities including the introduction of nonnative fish, and to increase the resistance and resilience of native species and ecosystems to human-induced environmental modifications such as disease and unprecedented climate change. Specifically, this Restoration Plan/FEIS is needed to help prevent MYLFs from being extirpated in the parks and to help restore healthy native high elevation ecosystems in SEKI.

The management strategies included in this Restoration Plan/FEIS are intended to be adaptive and dynamic, allowing for the incorporation of new scientific information over time to best meet the objectives of the aquatic ecosystem restoration program. Therefore, this plan calls for monitoring, assessment, and regular programmatic reviews. During implementation, the effectiveness of this plan will be reviewed at least once every 5 to 10 years to evaluate new species information, scientific findings, habitat information, and restoration and monitoring results. Following each review, the plan will be revised if necessary to address emerging issues and incorporate new information into the management strategies. Additional public involvement and/or tiered environmental compliance will occur as appropriate.

In accordance with §102(2)(C) of the National Environmental Policy Act of 1969 (NEPA; Public Law [PL] 91-190), SEKI has prepared the Restoration Plan and FEIS to consider alternative strategies to restore and conserve native species diversity and ecological function to selected high elevation aquatic ecosystems in SEKI that have been disturbed by human activities, particularly the stocking of nonnative trout. Four alternatives, including the no-action alternative, are identified and analyzed. The alternatives represent a range of reasonable and feasible options for addressing the goals and objectives of this plan and the issues and concerns raised by parks staff, other government agencies, and members of the public during the plan's scoping process.

## **GOALS AND OBJECTIVES**

The overall goal of this Restoration Plan/FEIS is to restore clusters of waterbodies to their naturally fishless state in strategic locations across SEKI to create high elevation ecosystems having more favorable habitat conditions for the persistence of native species and ecosystem processes. The following management objectives were developed for this Restoration Plan/FEIS based on the purpose and need for the plan. These objectives comply with the executive orders, laws, policies, and/or plans that guide the management of natural resources in national parks.

- A) Restore and conserve the natural abundances, distributions, and functions of native species, populations, and communities within selected high elevation aquatic ecosystems.
- implement management actions to create more favorable conditions for these populations to persist and be more resilient to human-induced changes to environmental conditions; and,
  - restore habitat to its historically fishless condition at the parks scale, including the eradication of fish from up to 85 (15%) of 550 nonnative fish-containing lakes, ponds, and marshes, approximately 31 miles of streams, and connected fish-containing habitat as necessary.

B) Develop a long-term conservation strategy for both species of MYLFs (*R. muscosa* and *R. sierrae*) to ensure the self-sustaining, long-term viability, and evolution of MYLF populations in perpetuity within portions of their present and historic geographic range within the parks, and to maintain the genetic and ecological diversity of these species.

- reverse widespread loss of the ecological function formerly provided by MYLFs and maintain the viability of existing MYLF populations throughout the range of both species within the parks;
- restore selected habitat and expand existing MYLF populations;
- re-establish MYLFs in selected basins where populations were historically present, but are now absent; and
- collaborate with partners to exchange information, enhance use of available resources, and strategically restore and conserve MYLFs in the Sierra Nevada.

C) Identify information that is needed for effective conservation and management of aquatic ecosystems in the face of unprecedented rates of human-induced change.

D) Use results from restoration efforts and new knowledge from research studies to refine program methodologies over time and mitigate impacts that have the potential to occur during restoration.

E) Restore and protect natural processes in wilderness, using an appropriate range of management actions, including minimum tool utilization derived from thorough analyses of potential effects to wilderness character and resources.

F) Provide an appropriate range of visitor experiences and recreational opportunities at wilderness lakes and streams concurrent with minimizing the degradations that have occurred to the biological integrity of high elevation aquatic ecosystems.

The objectives for this plan are grounded in a series of laws commonly known as the National Park Service Organic Act of 1916, the General Authorities Act of 1970, and the Redwood Amendments of 1978 that provide overall management direction for units of the National Park System. 54 U.S.C. 100101 *et. seq.* These interrelated authorities express the fundamental purpose of the National Park System, which begins with the mandate to conserve park resources and values and also includes the mandate to provide for visitor enjoyment of these resources and values. The mandate to conserve park resources and values is complemented by a statutory prohibition on the impairment of park resources and values.

## **DECISION**

### **BASIS FOR DECISION**

All of the alternatives presented in the Restoration Plan/FEIS were designed to meet the requirements of the Organic Act, Wilderness Act, and Endangered Species Act, the establishing legislations of the parks, and other relevant laws and NPS policies. Accordingly, each alternative, to a varying degree, meets one of more of the objectives for the restoration of high elevation aquatic ecosystems in the parks as detailed above and in chapter 1 of the Restoration Plan/FEIS.

Under alternative A, no-action, nonnative fish eradications and ecosystem restoration actions would be limited to the 25 previously approved waterbodies, including two waterbodies for experimental restoration by researchers from 1997-1999, and 23 waterbodies for preliminary restoration by SEKI from 2001-2017. No new waterbodies for nonnative fish eradication are proposed. This alternative would not meet restoration objectives or the goals of the conservation strategy because it would not restore additional and more complex waterbodies to their historically fishless condition. This alternative would likely not slow or reverse the rapid decline of MYLFs nor provide for the expansion of existing MYLFs populations, and existing MYLFs would not be more resilient to human-induced changes to environmental conditions.

Under alternative C, nonnative fish would be eradicated from 52 waterbodies and 15 mi (25 km) of streams in 17 basins using physical treatment methods. MYLFs and other native species would be restored to 52 waterbodies using natural recolonization where adjacent source populations exist, and reintroductions where adjacent source populations do not exist. Alternative C would partially meet the objectives of the MYLF conservation strategy because there would be additional waterbodies restored versus no action, but fewer waterbodies restored when compared with alternatives B and D. The more complex waterbodies would not be restored, thus this alternative would not fully meet the objective to allow more favorable conditions for MYLF populations to persist and be more resilient to human-induced changes to environmental conditions. The viability of existing MYLF populations would be maintained but to a lesser extent than alternatives B and D. The natural quality of wilderness character would be restored but to a lesser extent than alternatives B and D.

Both alternatives B and D would eradicate nonnative fish from the maximum number of waterbodies determined to be feasible during the 25-35 implementation period: 85 waterbodies and 31 mi (50 km) of streams in 21 basins, plus connected habitat as necessary. Alternative B would use physical and piscicide treatment methods to eradicate nonnative fish, and alternative D would use piscicide treatment methods only. Under both alternatives, MYLFs and other native species would be restored to 85 waterbodies using natural recolonization where adjacent source populations exist, and reintroductions where adjacent source populations do not exist. More complex waterbodies would be restored, creating more favorable conditions for MYLF populations to persist and be more resilient to human-induced changes to environmental conditions. Both alternatives would restore the natural quality of wilderness character by removing nonnative fish from selected historically fishless areas.

Alternative D would accomplish the project objectives in a slightly quicker timeframe because only piscicides would be used to eradicate nonnative fish; however, it would result in more short-term adverse effects on wilderness character from larger crew sizes (affecting solitude), and more short-term adverse effects on special-status species, vertebrates, invertebrates, water quality, and wilderness (natural quality), resulting from the use of piscicides in more waterbodies.

The Selected Action, Alternative B, more fully meets the objectives related to the preservation of wilderness character, and would result in fewer adverse effects overall. Alternative B utilizes piscicides only in locations where physical methods are deemed infeasible, thus reducing the short-term adverse effects on the impact topics described in the preceding paragraph. A large portion of the actions under Alternative B can be conducted with smaller crews, reducing the effects on solitude. Alternative B also has the greatest educational benefit to SEKI and other organizations conducting research because different methods will be compared, which will allow for a robust refinement of restoration methodologies within SEKI and in similar habitats across the Sierra Nevada. Alternative B, even though implementation takes more time than alternative D, will meet the goals identified in the nearly complete conservation strategy for MYLFs by restoring more complex waterbodies and creating more favorable conditions for MYLF populations to persist and recover. Alternative B is the environmentally preferable alternative.

Alternative B is determined to be most likely to accomplish the critical objectives identified in the Purpose and Need (defined in Chapter 1 of the Restoration Plan/FEIS and summarized previously in this ROD). Examples of how alternative B meets these critical objectives include:

Restore and conserve the natural abundances, distributions, and functions of native species, populations, and communities within selected high elevation aquatic ecosystems.

- A total of 85 new waterbodies will be restored to their historically fishless condition, and thus 15% of 550 fish-containing lakes and ponds that are current candidates for eradication will be restored.
- A total of 21 basins will be restored. All of the parks' five major drainages will contain one or more restoration basins.

Develop a long-term conservation strategy for both species of MYLFs to ensure the self-sustaining, long-term viability, and evolution of MYLF populations in perpetuity within portions of their present and historic geographic range within the parks, and to maintain the genetic and ecological diversity of these species.

- A MYLF conservation strategy will be developed in collaboration with partner agencies and organizations.
- To the maximum extent feasible, additional MYLF habitat will be restored, existing MYLF populations will be allowed to expand into restored habitat, and MYLF populations will be re-established in selected basins or waterbodies where they have gone absent. The widespread loss of the ecological function provided by MYLFs is reduced, and the viability of numerous existing MYLF populations is maintained, as much as is possible during the life of this plan.

Use results from restoration efforts and new knowledge from research studies to refine program methodologies over time and mitigate impacts that have the potential to occur during restoration.

- New restoration efforts will be conducted, using two fish eradication methods. The results of these efforts, plus new data from scientific studies, will allow for a robust refinement of restoration methodologies.
- This alternative will have the greatest educational benefit to SEKI and other organizations conducting restoration because it uses several fish eradication tools and several frog restoration methods, the results of which will help inform future recovery efforts.

Restore and protect natural processes in wilderness, using an appropriate range of management actions derived from thorough analyses of potential effects to wilderness character and resources.

- Natural qualities in wilderness will be restored to the maximum extent feasible during the life of this plan by eliminating impacts caused by self-sustaining nonnative trout populations in 85 waterbodies and 31 mi (50 km) of streams, plus connected fish-containing habitat as necessary.

## **SELECTED ACTION**

After reviewing the foreseeable environmental impacts of each alternative, the purpose and need for action, assessing how each alternative meets the restoration goals and objectives, and all public and agency comments, alternative B is the Selected Action. In reaching a decision on the selected action, the NPS carefully considered the multiple laws and policies that apply to the administration of NPS lands, the protection of wilderness character, endangered species preservation and management, the large body of scientific information regarding the impacts of nonnative trout and the use of piscicides, and the public comments that were received during the planning process.

- Under the Selected Action, a prescription (detailed plan of action) for restoration will be developed for each proposed restoration area based on the criteria for basin selection, pre-treatment surveys, habitat size, basin topography, wilderness values, visitor use and field crew safety. Prescriptions will consider the actual distribution of fish, results of invertebrate surveys and unique habitats such as springs and thermal features. Both physical treatment and piscicide treatment methods will be employed.
- Physical treatment is the preferred method under the Selected Action. Physical treatment tools consist of gill-netting, electrofishing, trapping, and disruption and/or covering of redds. Based on current knowledge of the proposed fish eradication sites, physical treatment will be used for 52 waterbodies (27 lakes, 24 ponds, 1 marsh; total of 492 ac/199 ha) and approximately 15 mi (25 km) of streams in 17 basins.
- Piscicide treatment will use a rotenone-based product, currently CFT Legumine™. Piscicide treatment is prescribed where: (1) a lake is too large or lacks accessible shoreline; (2) a stream is too long, steep, or marshy or has other characteristics that make physical treatment ineffective for fish eradication; (3) implementation of physical treatment poses an unacceptable safety risk to field crews; or (4) the selected waterbodies exist in basin complexes that lack natural barriers between most of the individual lakes or are too extensive for physical treatment. In addition, if a waterfall or cascade expected to be a fish barrier at the bottom of a physical treatment area proves inadequate in preventing fish passage, piscicides will be used in the aquatic habitat below the inadequate cascade in order to eradicate fish down to a definitive fish barrier. The waterbodies for piscicide treatment also include a few small sites located on marshy stream reaches where it is infeasible to exclude a waterbody from the reach. Waterbodies that provide more value in the face of climate change (i.e. large, deep, and/or cold waterbodies that can buffer drying and warming) are included for fish eradication in the plan.
- Piscicide treatment will be used for up to 33 waterbodies (4 lakes, 25 ponds, and 4 marshes; total of 142 ac/57 ha) and approximately 16 mi (25 km) of stream in 9 basins. In addition, any fish-containing habitat adjacent to treated lakes, ponds and streams identified during fieldwork will also require treatment (physical or piscicide depending on conditions) in order to eradicate fish from each restoration area. These are generally small areas that are not captured in existing maps of proposed project areas.
- Although the total acreage requiring treatment may change slightly based on site-specific survey information and prescription development, the number of waterbodies and stream miles identified for treatment represents the maximum number of waterbodies to be treated. After all treatments are completed, self-sustaining nonnative trout populations would continue to exist in 465 waterbodies (221 lakes, 186 ponds, 58 marshes) and hundreds of miles of stream.
- Fishless habitat in the 21 fish eradication basins, plus 34 additional basins where no fish eradication will occur, will receive conservation actions to benefit MYLFs and other native species.

## **OTHER ALTERNATIVES CONSIDERED**

### **Alternative A: No Action**

Under the no action alternative, the existing high elevation aquatic ecosystem restoration effort for 25 waterbodies and 3.7 mi of streams in seven basins would be completed, maintained, and monitored, but no new fish eradication activities would be initiated. Native species and ecological processes in high elevation aquatic ecosystems would continue to be monitored. Research on native species, ecological processes, and their stressors would continue in accordance with NPS policy. After all treatments are

completed, self-sustaining nonnative trout populations would continue to exist in 550 waterbodies (252 lakes, 235 ponds, 63 marshes) and hundreds of miles of stream.

### **Alternative C: Physical Treatment Preceding Restoration**

Alternative C would use physical treatment methods only to eradicate nonnative fish by gill netting, electrofishing, trapping, disturbing and/or covering redds, and blasting rock to create vertical fish barriers. In comparison to alternative B, excluded from the list of proposed restoration waterbodies are long reaches of stream, several large lakes, and interconnected lake complexes that are too large for effective physical treatment. Under this alternative, a prescription for restoration would be developed for each proposed restoration area based on the criteria for basin selection, pre-treatment surveys, habitat size, basin topography, wilderness values, visitor use, field crew safety, and the actual distribution of fish and amphibians.

Physical treatment methods would be applied in 52 waterbodies (27 lakes, 24 ponds, and 1 marsh; total of 492 ac/199 ha) and 15 mi (25 km) of streams contained in 17 basins. In addition, any unsurveyed habitat adjacent to treated lakes, ponds, marshes, and streams found to contain nonnative fish would be treated to eradicate fish from the entire scope of the restoration area. After all treatments are completed, self-sustaining nonnative trout populations would continue to exist in 498 waterbodies (225 lakes, 211 ponds, 62 marshes) and hundreds of miles of stream.

### **Alternative D: Piscicide Treatment Preceding Restoration**

Alternative D emphasizes speed in recovering habitat because MYLF populations are declining rapidly. To achieve this speed, only piscicide treatment would be used for nonnative fish eradication. Properly applied, piscicides can eliminate fish from targeted waterbodies in 1 to 2 years, in contrast to physical treatment methods which can take up to 6 years for lakes and up to 10 years for streams (NPS 2012A). A prescription for treatment would be developed as described in alternative B. Based on initial examination of maps, staff familiarity with the park, and discussions with other scientists, piscicide treatment would be used for 85 waterbodies (31 lakes, 49 ponds, and 5 marshes; total of 634 ac/257 ha), approximately 31 mi (50 km) of streams, and connected fish-containing habitat as necessary. Although the total acreage requiring treatment may change slightly based on site-specific survey information and prescription development, the number of waterbodies and stream miles identified for treatment represents the maximum number of waterbodies to be treated in this alternative. After all treatments are completed, self-sustaining nonnative trout populations would continue to exist in 465 waterbodies (221 lakes, 186 ponds, 58 marshes) and hundreds of miles of stream.

## **ENVIRONMENTALLY PREFERABLE ALTERNATIVE**

The Council on Environmental Quality (CEQ) defines the environmentally preferable alternative as — the alternative that would promote the national environmental policy as expressed in NEPA § 101. Section 101 states that it is the continuing responsibility of the federal government to:

1. Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
2. Assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
3. Attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;
4. Preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity and variety of individual choice;



5. Achieve a balance between population and resource use which would permit high standards of living and a wide sharing of life's amenities; and
6. Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

The identification of the environmentally preferred alternative was based on analyses that balance factors such as number of sites to be treated, physical impacts on the environment, mitigation measures to minimize impacts, achievement of short- and long-term goals for restoration of high elevation ecosystems, and other factors, including the statutory mission of the NPS and the purposes for the project.

Alternative A, no action, maintains the status quo. This alternative limits restoration of native species in high elevation aquatic ecosystems to work initiated in 2001. It does not build on success of the 2001 work which demonstrated that nonnative fish eradication is feasible and beneficial to MYLFs, other native species and ecosystem function within a relatively short time (3 to 10 years). It does not initiate any new restoration efforts to restore and conserve native species in high elevation aquatic ecosystems. It partially supports the short-term goals for restoration of native species diversity and ecological function to SEKI's high elevation aquatic ecosystems, but the long-term goals would not be met. It does not propose any new actions that would further protect or restore the wilderness resources, values, and diversity of recreational experiences. Alternative A would partially promote CEQ criteria 2 and 3 in that there would be no short-term resource degradation or risk to project personnel health and safety from the use of piscicides. However, the no action alternative would not arrest further degradation of MYLF populations in the parks, even in the short term. Over the long term, the failure to expand restoration actions to additional aquatic systems would result in a continued degraded state in these systems and the undesirable consequence of further depletions in MYLF populations. The no action alternative would not further CEQ criteria 1, 4, and 5 because actions proposed in the plan to support the conservation of native species at risk of extirpation in the parks would not be sought, nor would the alternative allow for the restoration of additional high elevation native ecosystems. Alternative A would not result in a better balance between those high elevation ecosystems that are heavily altered by nonnative fish and those that are not.

Alternative B, Prescription Treatment (Physical and Piscicide) Preceding Restoration is the NPS Environmentally Preferred Alternative. It would promote CEQ criteria 1, 4, and 5 to a greater degree than the other alternatives because it would do more to reverse the decline of native species in the parks and restore native ecosystems while minimizing the use of piscicides. This alternative proposes eradication of nonnative fish through the use of physical and piscicide treatment methods to optimize the number and size of restoration areas. Both methods target nonnative fish and could result in short-term adverse effects on native species. However in the long term, native species would be restored to selected high elevation aquatic ecosystems enhancing the preservation of natural aspects of our national heritage. While there would be short term effects to non-target species from the use of piscicides, these products degrade quickly and do not result in long term environmental effects. Angling opportunities would remain plentiful. In the short term, alternative B would not promote CEQ criteria 2 and 3 because it would result in a short-term degradation of natural resources and it would expose parks staff to piscicides. On the other hand, the restoration of MYLF populations and the removal of nonnative fish from additional areas would substantially promote criteria 2 (aesthetics) and criteria 4 over the long term. Alternative B would also promote the attainment of a wide range of beneficial uses over the long term by restoring MYLF populations and native ecosystems and minimizing the undesirable consequences of further reductions in these imperiled species.

Alternative C, Physical Treatment Preceding Restoration proposes eradication of nonnative fish using physical treatment methods only. The number of restoration sites treated under this alternative would be less than two thirds (61%) of the restoration sites treated under alternatives B or D. This alternative would partially promote criteria 2 and 3 in that there would be no short-term resource degradation or risk to project personnel health and safety from the use of piscicides. However, it would not promote CEQ criteria 1, 4, and 5 to the same extent as Alternative B because nonnative fish would be removed from far fewer areas resulting in reduced conservation benefits to native species at risk of extirpation in the parks and native ecosystems. Alternative C would also not promote the attainment of a wide range of beneficial uses in the long term to the same degree as Alternative B because less habitat and fewer MYLF populations would be restored, resulting in reduced native ecosystems restoration when compared with Alternative B.

Alternative D, Piscicide Treatment Preceding Restoration proposes eradication of nonnative fish using piscicide methods only. Piscicide treatment has more short-term effects on native species than physical treatment and thus would increase the need for more extensive restoration efforts after treatment. This alternative would promote CEQ criteria 1, 4, and 5 because it would reverse the decline of native species in the park and restore native ecosystems in selected areas. It would not fully promote CEQ criteria 2 and 3 because it would result in more short-term degradation of natural resources than Alternative B. Similarly, it would result in increased exposure of parks staff to piscicides compared to Alternative B. Over the long term, Alternative D would substantially promote CEQ criteria 2 in that it would result in the restoration of MYLF populations and native ecosystems.

## **PUBLIC ENGAGEMENT AND AGENCY COORDINATION**

### **PUBLIC SCOPING**

Public scoping was conducted from January 17 to February 6, 2007, but comments were accepted as late as April. During that time, the parks received comments from 35 different sources (several people submitted more than one comment letter). Six of the comment letters received were from organizations: High Sierra Hikers Association, Wilderness Watch, California Trout, Californians for Western Wilderness, National Parks Conservation Association, and Californians for Alternatives to Toxics. Five commenters were affiliated with universities, three with businesses, one was affiliated with the USFS, and the parks received 22 comments from unaffiliated individuals.

In late 2007, a newsletter providing an update on the environmental analysis status was sent to approximately 100 individuals, agencies, interest groups, and tribes on the parks' mailing list including all those who provided comments during the scoping period. As a result of the newsletter, four additional comment letters were received between May 2007 and November 2008 and are included in the record. Two of those letters were from unaffiliated individuals (one had previously submitted comments), and two were from organizations, Western Environmental Law Center and High Sierra Hikers Association (previously submitted comments). In total, 37 different individuals, groups, businesses, or agencies submitted comments on the proposed project.

In late 2007, park staff began writing an environmental assessment (EA) for the proposed project. As staff prepared the EA, including the environmental analysis for the proposed project, and re-reviewed the public input on the proposal, it became clear that the project had the potential for significant impacts on the human environment. There was a level of controversy associated with the proposal, the potential for uncertain and potentially significant environmental effects (beneficial and adverse), and that the project could result in unique and unknown environmental effects. For these reasons, in accordance with the National Environmental Policy Act (NEPA) section 102 (2) (C), in early 2009, the superintendent determined that an Environmental Impact Statement (EIS) would be more appropriate for this project.

A notice of intent to prepare an environmental impact statement was published in the *Federal Register* for this project on October 7, 2009 (Vol. 74, No. 193, Pgs. 51617-18). Scoping occurred from October 7 through November 21, 2009. Information about the project scoping was picked up by the Associated Press and was published in area newspapers and on the internet on various public and government websites. Area newspapers that published stories related to the proposed project and scoping include: The Kaweah Commonwealth (October 30), The Visalia Times Delta (October 27), and The Fresno Bee (October 26). Websites included: abclocal.go.com (October 26); cbs13.com (October 26); mercedsunstar.com (October 26); kcbs.com (October 26); fresnobee.com (October 26); ksrw.sierrawave.net (October 7); Save the Frogs (November 18); treehugger.com (November 22); National Parks Traveler (November 20); Sierra Forest Legacy (November 12); and redding.com (October 30). Also the story was broadcast on “The California Report” (November 16), which airs on various local radio stations in California. In addition, further information was provided on the proposed project after scoping ended at Golden Gate Press (December 3) and at alternatives2toxics.org (December 16).

Two public informational meetings were held to provide information on the proposed project during the scoping period. SEKI received 709 comment letters during the scoping period.

In addition to the scoping meetings, alternatives presentations and workshops were held in the area in March and April 2010 to engage the public during the development of alternatives. All scoping commenters plus those on the project mailing list were notified of the meetings (approximately 1,000 people) by either email or regular mail. Between March 11 and April 12, 2010, draft conceptual alternatives were made available from the parks’ internet page and through the NPS Planning, Environment, and Public Comment (PEPC) website, and comments were accepted and considered on those alternatives. Eight comment letters were received during the alternatives review period; none provided new alternatives or additional new substantive comments.

## **PUBLIC REVIEW OF THE PLAN/DEIS**

The Restoration Plan/DEIS (NPS 2013A) was available to the public, federal, state, and local agencies, tribes, and organizations for a 60-day public review period starting September 26, 2013. The NPS published a Notice of Availability in the *Federal Register* on October 1, 2013 (Vol. 78, No. 193, Pgs. 60309-11). The NPS posted electronic copies of the Restoration Plan/DEIS to the PEPC website at <http://parkplanning.nps.gov/aquatics> and provided printed or CD copies of the Restoration Plan/DEIS to 138 interested parties on the parks’ mailing list and to those who requested them. A printed copy was provided to 23 area public libraries in Tulare, Inyo, Fresno, and Kern counties. In addition, notification of the Restoration Plan/DEIS was sent by email or regular U.S. mail to 1,309 people on the parks’ mailing list. A news release was distributed to media outlets, and was placed on the parks’ website. In October 2013, due to an extended shutdown of the federal government, and the unavailability of federal systems that allowed the review of the draft plan, the public review period was extended to December 17, 2013. The extension notice was published in the *Federal Register* on November 1, 2013 (Vol. 78, No. 193, Pgs. 65643-44).

Park staff presented elements of the Restoration Plan/DEIS at three public meetings. During the public review period, the parks received 123 public comment letters: 116 from individuals; 4 from federal, state, county, or local governments; 1 from a tribe; and 2 from recreational or conservation-related interest groups. The analysis of these letters identified 359 substantive comments, from which 48 concern statements were generated. Notably the US Environmental Protection Agency (USEPA) accorded its most favorable rating of “Lack of Objections” to the Restoration Plan/DEIS (letter dated December 20, 2013).

The results of the public comment analysis process and the NPS responses to substantive public comments are provided in “Appendix E: Public Comment Concern/Response Report.” A summary of the changes between the draft and final Restoration Plan/FEIS is included in Chapter 1.

## **PLAN/FEIS**

The USEPA's notice of filing and release for public inspection of the Restoration Plan/FEIS was published in the *Federal Register* on June 10, 2016 (Vol. 81, No. 112, Pg. 37592), initiating the 30-day no action period which ended on July 11, 2016. [The NPS's Notice of Availability was published therein on June 13, 2016 (Vol. 81, No. 112, Pgs. 38213-14).] The NPS posted electronic copies of the Restoration Plan/FEIS to the NPS PEPC website. Printed or electronic copies of the Restoration Plan/FEIS were provided to 130 interested parties on the parks' mailing list and to those who requested copies. Printed copies were provided to 18 area public libraries. In addition, a notice of availability of the Restoration Plan/FEIS was sent by email or regular U.S. mail to 1,409 people on the parks' mailing list, and to 104 area tribes, tribal groups, or representatives. A news release was distributed to approximately 150 media outlets, and information was placed on the parks' website. Although the document was released for public inspection, and not review purposes, four recipients of the Restoration Plan/FEIS submitted responses. All but one of them reiterated prior comments (no new substantial information or concerns were provided) that were previously addressed in the FEIS and Public Comment / Concern Response Report (appendix E).

One recipient, who did not provide comments during the public review of the Restoration Plan/DEIS, submitted comments not previously considered. They suggested that the Selected Action include fish eradication in at least 50% of lakes containing nonnative fish in order to be consistent with the Endangered Species Act (to recover MYLF populations and habitat) and to sufficiently restore and conserve native species diversity and ecological function to SEKI's high elevation aquatic ecosystems. This alternative was not considered in the Restoration Plan/FEIS because the amount of fish eradication proposed under the Selected Action is the maximum that is feasible over the 25 to 35 year duration of the plan. The remote, high elevation locations where eradication would occur are only accessible about three months per year. It would not be feasible to eradicate fish from more habitat without vastly increasing the use of piscicides and crew sizes, which would substantially increase adverse effects. In addition, substantial increases in project funding would be necessary. The Selected Action has the full support of the U.S. Fish and Wildlife Service (FWS) (appendix L) and is consistent with their nearly complete conservation strategy. The 85 waterbodies and 31 miles of streams selected for fish eradication represent a large amount of habitat that will greatly contribute to aquatic ecosystem restoration across the parks. In addition, the suite of frog restoration actions in the 21 fish eradication basins plus 34 basins containing fishless habitat will contribute significantly to MYLF recovery. These complementary actions will substantially restore and conserve native species and ecological function and increase protections to MYLFs from nonnative fish, disease, and climate change. Further, this plan is adaptive; project results and field conditions will be evaluated over time and adjusted as necessary to meet conservation goals.

## **AGENCY AND TRIBAL GOVERNMENT CONSULTATION**

### **U.S. Fish and Wildlife Service**

The Endangered Species Act of 1973, as amended (16 USC 1531 et seq.), requires all federal agencies to consult with the FWS to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of listed species or critical habitat. The NPS reviewed the special-status species lists on the FWS website in 2006, 2009, 2012, and again on February 10, 2016 (see appendix F of the Restoration Plan/FEIS). The NPS submitted a biological assessment (BA) to the FWS on February 24, 2016. The FWS responded to the NPS on May 25, 2016 with a Biological Opinion, including concurrence that the Restoration Plan as proposed is not likely to: jeopardize the continued existence of the northern distinct population segment of the mountain yellow-legged frog, the Sierra Nevada yellow-legged frog, the Yosemite toad, the Little Kern golden trout, and the Sierra Nevada bighorn sheep; destroy or adversely modify proposed critical habitat for the northern distinct population

segment of the mountain yellow-legged frog, the Sierra Nevada yellow-legged frog, and the Yosemite toad; or adversely affect designated critical habitat for the Little Kern golden trout and the Sierra Nevada bighorn sheep (appendix L of the Restoration Plan/FEIS).

### **State of California Central Valley Regional Water Quality Control Board**

The Central Valley Regional Water Quality Control Board (CRWQCB) is the regulatory agency which determines whether to grant Waste Discharge Requirements and whether the proposed piscicide treatments are consistent with provisions for piscicide treatments in the Water Quality Control Plan for the Tulare Lake Basin (CRWQCB 2015A), and the Sacramento River Basin and San Joaquin River Basin (CRWQCB 2015B). The CRWQCB provided information to the NPS during and following the public review period on the requirements for project implementation. Prior to project implementation, SEKI will obtain a project-specific National Pollutant Discharge Elimination system (NPDES) permit for rotenone application. The NPDES permit will contain receiving water limits applicable to rotenone projects as contained in the Tulare Basin, and Sacramento and San Joaquin Plans (CRWQCB 2015A, 2015B). It will also require water quality monitoring to verify compliance with receiving water limits within the project area and in downstream waters both during and after the treatment.

CDPR requires that pesticide applications be managed by trained and certified applicators. Though not a requirement for federal land managers, at least one member of the onsite piscicides application crew will be certified by CDPR as an applicator and all of the restoration crew working with piscicides will be trained in proper use of personal protective equipment, product safety measures, and they will operate under the direction of the certified applicator(s).

### **Area Tribes**

The NPS has contacted American Indian tribes and groups having a cultural association with the parks, as well as those in the immediate vicinity, throughout the development of the Restoration Plan/DEIS. Consultation was initiated in 2007 during the scoping period for the EA, and in 2009 during the scoping period for the Restoration Plan/DEIS. In September 2013, the superintendent sent a letter to area tribes asking for their review on the Restoration Plan/DEIS, and invited area tribes to attend a meeting on the project. Information on the Restoration Plan/DEIS was provided to the attendees at the Sierra and Sequoia Tribal Forum Meetings on November 19, 2013. A presentation was provided at that time, along with an invitation to schedule formal government-to-government consultations with individual tribes. No tribal group requested formal consultation during the planning process.

### **State Historic Preservation Office**

Section 106 of the National Historic Preservation Act (NHPA) requires that federal agencies take into account the effect of any proposed undertakings on properties that are listed, or eligible for listing, in the National Register of Historic Places. Since this project involves no ground disturbance and there are no historic properties affected, the assessment of effect is that the project has no potential to cause effects, thus no consultation with the State Historic Preservation Office is required.

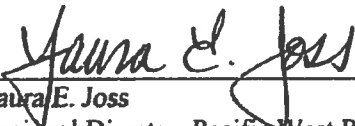
## CONCLUSION


Overall, of the four alternatives considered, the Selected Action, alternative B, best meets the purpose, need, and objectives of the Restoration Plan/FEIS and is expected to restore native species to selected high elevation aquatic ecosystems, protect and restore endangered MYLF populations, and restore the natural quality of wilderness character while continuing to provide opportunities for primitive and unconfined recreation. The selected action incorporates practical means to avoid or minimize environmental harm and will not result in the impairment of wilderness park resources and values or violate the NPS Organic Act.

As noted, the required minimum 30-day no-action period before approval of the ROD was initiated on June 10, 2016 with the USEPA's Federal Register notification of the filing of the Restoration Plan/FEIS. The no-action period ended on July 11, 2016.

The official responsible for implementing the selected action is the Superintendent of Sequoia and Kings Canyon National Parks.

**Approved:**

  
\_\_\_\_\_  
Laura E. Joss  
Regional Director, Pacific West Region

  
\_\_\_\_\_  
Date

# ATTACHMENT A: MEASURES TO MINIMIZE ENVIRONMENTAL HARM

## Sequoia and Kings Canyon National Parks Restoration of Native Species in High Elevation Aquatic Ecosystems Plan Record of Decision

The National Park Service (NPS) places a strong emphasis on measures to avoid, minimize, or mitigate potential environmental impacts. The Restoration of Native Species in High Elevation Aquatic Ecosystems Plan / Final Environmental Impact Statement (Restoration Plan/FEIS) for Sequoia and Kings Canyon National Parks (SEKI or the parks) incorporates mitigations to protect natural and cultural resources, wilderness character, and visitors and work crews. These measures also incorporate the mandatory Terms and Conditions and Conservation Measures from the U.S. Fish and Wildlife Service biological opinion. Mitigations are considered part of plan implementation, and must occur prior to, during, or after project implementation.

Action	Responsibility
<b>MEASURES TO PROTECT WILDERNESS CHARACTER, AND NATURAL AND CULTURAL RESOURCES</b>	

### Work Crews

All crews will be instructed in and expected to use minimum impact camping practices and wilderness ethics.	Project lead (NPS Aquatic Ecologist)
Crew camps will be located where they have minimal impact on opportunities for solitude and primitive and unconfined recreation and the natural qualities of wilderness character. Generally, existing camps frequently used by the public will be avoided, but will be used if adequate naturally hardened sites are not available. Naturally hardened sites have a natural abundance of sand, gravel, or rock and a natural lack of grasses and forbs. Where possible, crew camps will be located at base camps used for previous projects, with minimum potential to disrupt wildlife habitat or habits.	Project lead (NPS Aquatic Ecologist)
Crews will be instructed on proper food-storage practices and camps will be inspected to make sure food is properly stored.	Project lead (NPS Aquatic Ecologist)
Water for the crews both at work sites and in camp will be taken from a stream or lake that will be accessed by non-sensitive paths. The crews will be instructed to avoid sensitive areas in both the work sites and crew camp areas.	Project lead (NPS Aquatic Ecologist)
Gray water will be disposed of over 100 ft (30 m) from any surface water and will be poured into a small pit through a screen to remove small food particles. Strained food particles are removed from the area with other trash.	Project lead (NPS Aquatic Ecologist)
Special containers or pit toilets will be used for toilets in all work and camp areas. The containers will be packed or flown out at the end of the field season and disposed of in a sewage treatment facility.	Project lead (NPS Aquatic Ecologist)

<b>Action</b>	<b>Responsibility</b>
No motorized equipment will be used in camp. A propane/white gas or battery-powered lantern or headlamp will be used to light the work and cooking area inside the work tent. All other light will be from personal flashlights and headlamps.	Project lead (NPS Aquatic Ecologist)
All equipment, clothing, and gear will be checked for debris, cleaned of any visible plant or soil matter, and gear regularly used in water will be disinfected with quaternary ammonia following SEKI's disinfection protocol, prior to moving to a new site.	Project lead (NPS Aquatic Ecologist)

**Stock Use**

SEKI's packstock operations will be subject to the same minimum impact standards and grazing regulations as general parks users.	NPS Packer
Packstock (fur and hooves) and equipment will be inspected and cleaned of seeds and dirt, as necessary, before leaving the front country.	NPS Packer
All SEKI grazing restrictions and regulations will be adhered to. Where grazing is not allowed, only supplemental feed products that have been either heat treated or fermented so as to render any weed seeds inviable will be fed to stock.	NPS Packer

**Helicopter Use**

A helicopter will be used only if determined through the minimum requirement analysis to be the minimum tool necessary for a particular project and project site.	Project lead (NPS Aquatic Ecologist) and Wilderness Coordinator
If a helicopter is determined to be the minimum tool, then a temporary landing zone will be established at the project site. The landing zone should be void of trees and boulders that could pose a threat to helicopter rotors; should be on flat, level surface; minimal exposure to heavy winds; sites with ease of landing (affects load weights that can be delivered); and in proximity to base camp.	NPS Helitack Operations, Supervisory Forestry Technician
No whitebark or foxtail pines may be cut to accommodate a landing zone.	NPS Helitack Operations, Supervisory Forestry Technician
A trained helicopter crewmember will be present at the work area to direct air operations, handle cargo and ensure public and employee safety.	NPS Helitack Operations, Supervisory Forestry Technician
Except in the case of a medical emergency, flights will occur only between 8:00 a.m. and 5:00 p.m. and will follow flight paths to and from the project sites designed to avoid sensitive areas.	NPS Helitack Operations, Supervisory Forestry Technician
Park staff will inform hikers of possible noise intrusions, when they will occur, and alternative routes visitors could use to avoid the noise.	Public Affairs Specialist
Park staff will inform visitors camping near the project sites and landing areas of flights and project activities.	Project lead (NPS Aquatic Ecologist)



<b>Action</b>	<b>Responsibility</b>
No helicopter fuel will be stored in wilderness. All helicopter fuel and other supplies not needed on the helicopter during flights will be stored at the frontcountry Ash Mountain Helibase.	NPS Helitack Operations, Supervisory Forestry Technician

**Measures to Minimize Harm to Mountain Yellow-legged Frogs**

All personnel involved in collection and handling for CMR, translocations, reintroductions, antifungal treatments, and any other methods that involve handling MYLFs will be professional biologists with years of experience with proper handling of endangered amphibians, or—for trained, but less experienced biologists—work under the direct supervision of professionals.	Project lead (NPS Aquatic Ecologist)
Handlers will have wet hands when handling any listed amphibian. No adults in amplexus (mating behavior) will be handled during routine monitoring and research activities.	Project lead (NPS Aquatic Ecologist)
MYLF handling will be kept to the minimum time necessary for effectively completing conservation actions.	Project lead (NPS Aquatic Ecologist)
Expeditious and cautious handling, including proper climate control, will be used during translocations and reintroduction efforts, including transport out of the wilderness, travel time to captive rearing facilities, and transport back to wilderness following captive-rearing.	Project lead (NPS Aquatic Ecologist)
All captive-rearing efforts will be undertaken by professional biologists and/or captive rearing facility staff experienced with animal care and disease management techniques.	Project lead (NPS Aquatic Ecologist)
Collections will be limited to the minimum number of animals necessary to successfully complete recovery actions and FWS will be consulted to obtain the proper permits.	Project lead (NPS Aquatic Ecologist)

**Measures to Protect Vegetation**

If species of concern are present in work and camp sites, appropriate mitigation measures will be taken, which could include collecting seed or flagging areas during project work to protect the species from onsite activities.	Project lead (NPS Aquatic Ecologist)
Equipment and materials will be inspected for soil and plant parts. Dirty materials will be cleaned before being transported to field sites. Equipment and materials that could acquire seeds from surrounding areas will be covered during transport.	Project lead (NPS Aquatic Ecologist)
A list and / or map of project areas will be maintained so that sites can subsequently be surveyed for invasive nonnative plants.	Project lead (NPS Aquatic Ecologist)
Work crews will inspect their shoes, clothing and equipment for seeds and soil before leaving the front country. Seeds and soil will be removed and placed in bagged garbage.	Project lead (NPS Aquatic Ecologist)

**Measures to Protect Wildlife**

Crew camps will be located at least 100 ft (30 m) away from aquatic habitat for MYLFs, Yosemite toads, and Little Kern golden trout, and away from ridgeline habitat for bighorn sheep.	Project lead (NPS Aquatic Ecologist)
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<b>Action</b>	<b>Responsibility</b>
Stock will be kept at least 100 ft (30 m) away from (1) the core aquatic habitat for MYLFs, Yosemite toads, and Little Kern golden trout; and (2) core terrestrial habitat for bighorn sheep.	Project lead (NPS Aquatic Ecologist)
Little Kern golden trout occur in one proposed treatment area (Crytes Basin; NPS unpublished data) included in this plan. If this population was determined to be useful as brood stock for management and restoration of Little Kern golden trout within the recovery plan area, SEKI will work with CDFW to live-capture and move as many fish as possible to an appropriate location outside of the project area.	Project lead (NPS Aquatic Ecologist)
Prior to any approved helicopter flight, the parks' wildlife biologist will provide a map of known bighorn sheep areas, and the helicopter will avoid flying above or landing in those areas; the final approach to the landing zone will stay below the area of the historic sightings. Flights will be suspended if sheep are observed within 0.5 mi (0.8 km) of the project area. The landing zone for the helicopter will be located no less than approximately 500 ft (152 m) from any area where sheep have been observed.	Project lead (NPS Aquatic Ecologist), NPS Wildlife Biologist, NPS Helitack Operations, Supervisory Forestry Technician
All personnel involved in garter snake relocation will be professional biologists with years of experience with proper handling and marking of snakes, or—for trained, but less experienced biologists—work under the direct supervision of professionals.	Project lead (NPS Aquatic Ecologist)
Handling of garter snakes for relocations will be kept to the minimum time necessary for effectively completing each relocation action.	Project lead (NPS Aquatic Ecologist)

**Measures to Protect Water Quality**

Equipment and materials will be stored at least 100 ft (30 m) from open water to reduce the likelihood of debris or sediment entering surface water.	Project lead (NPS Aquatic Ecologist)
Secondary containment for hazardous materials (e.g. piscicide or white gas) will be incorporated by placing buckets containing a small amount of soil (to minimize splashing of possible spills) under transfers of materials from one container to another. If hazardous materials were nevertheless spilled, they will be cleaned up immediately and will not be allowed to seep deep into the soil or reach open water sources. Absorbent pads will be onsite to absorb pooled hazardous materials. Shovels and bags will be onsite to gather surface soil in the spill area, which will be transported to the frontcountry for remediation.	Project lead (NPS Aquatic Ecologist)
Work crews will use appropriate methods for human waste treatment, which is typically a pit toilet, or special containers for removal to the frontcountry.	Project lead (NPS Aquatic Ecologist)

**Measures to Protect Soundscapes**

To minimize visitors' disturbance from unnatural sounds, project work will typically occur from 8:00 a.m. to 5:30 p.m.	Project lead (NPS Aquatic Ecologist)
Crew leaders will ensure that the crew's noise levels do not disturb nearby campers.	Project lead (NPS Aquatic Ecologist)
Information may be attached to wilderness permits to advise wilderness users about the need for management action and locations of work activities during their visit to the SEKI wilderness.	Project lead (NPS Aquatic Ecologist)

Action	Responsibility
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**Measures to Protect Cultural Resources**

Should any unknown cultural resources be encountered during implementation of plan activities, all ground disturbance will be immediately stopped. The parks' archeologist or a qualified representative will examine the area as soon as possible and will follow the requirements of the National Historic Preservation Act, and any other applicable cultural resource laws, as needed.	Project lead (NPS Aquatic Ecologist) and Cultural Resource Program Lead
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<b>MEASURES TO PROTECT VISITORS AND CREWS</b>
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**Measures for Visitor and Crew Safety**

Crews will be instructed in wilderness safety and communication protocols at the beginning of each field season; they will be provided with radios, and have an established, regular call-in time.	Project lead (NPS Aquatic Ecologist)
Crews will abide by the RMS Safety Plan.	Project lead (NPS Aquatic Ecologist)
Any visitors in active restoration areas will be met by a crewmember and kept a safe distance from any restoration activities.	Project lead (NPS Aquatic Ecologist)

***Visitor and Crew Safety During Piscicide Treatments***

<p>Experienced piscicide applicators will be directly involved in piscicide treatments in SEKI, and all treatments will be managed by applicators certified by C DPR to apply piscicides in state waters. Though not a requirement for federal land managers, this certification will ensure applications are correct and best management practices are applied during treatment activities.</p> <p>All of the restoration crew working with piscicides will be trained in proper use of PPE, product safety measures, and they will operate under the direction of the certified applicator(s) and in accordance with project safety plans or job hazard analysis.</p>	Project lead (NPS Aquatic Ecologist)
Application of rotenone will be carried out in a manner that strictly adheres to practices permitted by the product labeling, including use of PPE for applicators, controlling public access during application, determining the maximum necessary application concentrations, and all other applicable guidelines.	Project lead (NPS Aquatic Ecologist)
<p>Piscicide applications will be communicated to the public using (1) temporary information and warning signs posted on trails near the treatment area, (2) staff stationed on nearby trails, (3) visits to nearby campsites, (4) verbal contacts by the nearest wilderness rangers, (5) staff at local wilderness permit stations, (6) temporary postings to the parks website and (7) information attached to wilderness permits.</p> <p>Any area closures will be included in the annual updates to the Superintendent's compendium.</p>	Project lead (NPS Aquatic Ecologist), NPS Public Affairs Specialist, NPS Law Enforcement Specialist

<b>Action</b>	<b>Responsibility</b>
Prior to applications and throughout treatments, public access will be restricted through the use of signs located at trailheads and other strategic places.	Project lead (NPS Aquatic Ecologist)

**Mitigations Specific to Treatment Type**

*Gill Netting*

<p>While gill-netting, crewmembers will wear waterproof chest waders, safety waist belts, personal floatation devices (PFDs), flip fins, and adequate clothing to remain warm and dry while using float tubes.</p> <p>Crewmembers will be trained to always scan nets for non-target wildlife (primarily birds) when walking along shorelines to allow for a captured animal to be detected and released before mortality has occurred.</p> <p>Crew members without direct experience with handling non-target wildlife will receive training from an experienced biologist in how to safely remove non-target wildlife from nets.</p> <p>The shore ends of nets will be set 3 to 10 ft (1 to 3 m) from shore to provide a buffer for non-target animals to access shoreline habitat. Areas observed to periodically contain many tadpoles and frogs will generally be avoided when placing gill nets.</p>	Project lead (NPS Aquatic Ecologist)
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*Electrofishing*

<p>Crewmembers will wear waterproof chest waders and gloves that do not conduct electricity.</p> <p>Felt-soled boots used for project work will only be used at project sites. Boots will remain at each project site for the summer, and will be transported out of the project area for the winter, where they will be decontaminated before their next use. This process will eliminate the potential to sustain or transport undesirable nonnative species.</p> <p>During electrofishing, crews will continually scan the area in front of their progress for non-target wildlife including mountain yellow-legged frogs. If a non-target species is observed, the electrofisher is turned off until the animal leaves the water or the shocking area. If necessary, crews will capture and move the animal downstream or to adjacent terrestrial habitat and then proceed with electrofishing.</p>	Project lead (NPS Aquatic Ecologist)
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*Disruption and/or Covering of Redds*

Crewmembers will wear wading boots with felt-lined soles that provide improved stability.	Project lead (NPS Aquatic Ecologist)
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*Fish Traps*

While installing and monitoring fish traps, crewmembers will wear wading boots with felt-lined soles that provide improved stability, and gloves to protect their hands while working with the traps.	Project lead (NPS Aquatic Ecologist)
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Action	Responsibility
<i>Piscicide Use</i>	
<p>Any frogs or tadpoles observed that can be captured by hand, dip net and/or seine will be removed from the piscicide treatment area and placed in a nearby fishless waterbody disconnected from the treatment area while piscicide concentrations dissipate.</p> <p>If adequate fishless habitat is not present at the head of streams to provide upstream source populations of invertebrates for repopulating treated areas, then a section of stream will be physically treated to remove fish and create an upstream source population. A temporary fish barrier will be installed if needed to protect a source population from fish recolonization until fish are eradicated with piscicides.</p> <p>Rotenone drip stations will be placed in secure and stable locations either on the stream bank or on a stand in the stream channel, and are actively monitored by project staff for the duration of the treatment. The drip nozzles of the stations will be placed very close to the water’s surface to reduce the potential for piscicide drift to terrestrial environments. Rotenone applied from backpack sprayers is applied with the spray head very close to the water surface to minimize drift onto terrestrial environments.</p> <p>Fish will be collected prior from the project area to the treatment process and placed in net baskets just upstream of drip stations to monitor the effectiveness of the piscicide treatment.</p> <p>Rotenone will be neutralized by the careful addition of potassium permanganate to the water at established locations. Fish baskets will also be placed downstream of the neutralization station. Mortality of these fish will alert workers to potential releases of excess chemical in the event of human or equipment error and potential downstream effects.</p> <p>Treated fish that do not sink will have their swim bladders punctured so the carcasses will sink to the substrate.</p> <p>During and after rotenone treatments, water quality will be monitored to assess the effects of treatment on surface waters and bottom sediments. The monitoring will determine that: (1) effective piscicide concentrations of rotenone were applied; (2) sufficient degradation of rotenone has occurred prior to the resumption of public contact; and (3) rotenone toxicity does not occur outside the project area. An analytical laboratory will analyze water samples for rotenone and rotenolone concentrations as well as for volatile organic compound and semi-volatile organic compound concentrations because CFT Legumine™ contains petroleum distillates.</p> <p>A spill contingency plan will be developed and implemented to address chemical transport and use guidelines, as well as spill prevention and containment that adequately protects water quality. The spill contingency plan will be maintained on site.</p>	<p>Project lead (NPS Aquatic Ecologist)</p>

<b>Action</b>	<b>Responsibility</b>
<p>Piscicide containers will be securely locked or guarded when taken to the field for use.</p> <p>Any piscicide that is spilled will be scooped up (including all contaminated soil) with a shovel, placed in a bag designed for product disposal, and transported out of area for disposal as required on the product label.</p> <p>All personnel assisting in the fish removal will use hardened or durable sites for camping and will be familiar with and practice Leave-No-Trace (LNT) principles. A crew of eight to 15 people is expected to be sufficient to implement most treatments, and a crew of up to 16 to 25 people may be needed for one or more of the largest piscicide treatments.</p> <p>Trails will be used whenever possible to move from one location to another to minimize soil and vegetation disturbance and to prevent establishing new trails. Sensitive plant habitat will be avoided. Treatment activities will be coordinated with wilderness management personnel.</p> <p>To incorporate the results of actual piscicide treatments in SEKI to future treatments, an adaptive management approach will be implemented, in which intensive monitoring of the initial piscicide treatments is used to better describe the likely impacts of subsequent treatments, and if necessary, to redesign subsequent treatments to further minimize anticipated impacts.</p>	
<p><b>Terms and Conditions from the Biological Opinion (Appendix L in the Restoration Plan/FEIS)</b></p>	
<p>In order to be exempt from the prohibitions of section 9 of the Endangered Species Act, the NPS must ensure compliance with the following terms and conditions, which implement the reasonable and prudent measure. These terms and conditions are nondiscretionary.</p>	
<ol style="list-style-type: none"> <li>1. The NPS shall implement the Conservation Measures as described in the biological opinion.</li> <li>2. Mountain yellow-legged frog surveys, including capture and handling for measurements and examining for infections, shall follow the guidelines found in Knapp and Matthews (2000) as revised during the life of this project, or other guidelines as authorized by the FWS.</li> <li>3. The use of PIT-tagging and the injection of colored elastomers are authorized to mark individual mountain yellow-legged frogs, and shall be implemented in the following manner: <ol style="list-style-type: none"> <li>a. No mountain yellow-legged frogs less than 4 centimeters snout-vent length (SVL) shall be PIT-tagged. PIT tags of appropriate size shall be used (8-12 mm).</li> <li>b. Crews shall note any physical or behavioral changes to individual mountain yellow-legged frogs that could possibly be attributed to the insertion of PIT tags or injection of colored elastomer, such as swelling, bleeding, infection, or changes in</li> </ol> </li> </ol>	<p>Project lead (NPS Aquatic Ecologist)</p>

<b>Action</b>	<b>Responsibility</b>
<p>swimming ability. This information shall be included in the annual reports.</p> <p>c. Tissue samples for genetic research may be collected from tadpoles or adult mountain yellow-legged frogs. Tissue samples may be collected from swabbing the skin surface. Alternatively, for genetic research that may require a larger individual sample, clipping of a single toe from post-metamorphs to obtain tissue samples shall be allowed with the use of surgical scissors only.</p> <p>4. Collection of individual mountain yellow-legged frogs for examination and treatment of infectious disease.</p> <p>a. All captured individual mountain yellow-legged frogs may be examined, swabbed for determining the presence of infectious disease, and treated if a known or experimental treatment is available. Dead or moribund individual mountain yellow-legged frogs should also be swabbed, if practical, to determine cause of death.</p> <p>b. If individual mountain yellow-legged frogs are found to have signs of infection or determined to be infected by chytrid fungus (chytridiomycosis), they may be treated using itraconazole. Individuals may be retained in specially designed cages at the collection site for up to two weeks while being treated. Treatment method may vary; however, the field crew must have suitable experience conducting the treatment method.</p> <p>5. For the captive rearing and translocation program:</p> <p>a. All collection, transport, captive care, and release activities will follow the associated methods and protocols specified in the translocation plan as described in Knapp <i>et al</i> (2011) and the Conservation Strategy (Knapp, Appendix A <i>in</i> FWS in preparation). Any deviation from these methods and protocols requires prior approval from the FWS.</p> <p>b. The NPS, and all captive rearing facilities, shall assure to the maximum extent practicable that all individuals removed will not contract a disease, unless that is part of the immunization procedure for disease treatment. Potential threats to the mountain yellow-legged frog regarding the introduction and/ or spread of disease shall be closely monitored.</p> <p>c. Only individuals removed from the wild for captive rearing that are sick, injured, or have no reasonable prospect of being reintroduced to the wild may be euthanized for scientific research and vouchering of specimens, or if deemed fit enough, used for display or public outreach by the holding facility.</p> <p>d. The San Francisco Zoo, Oakland Zoo, or other facility authorized by the FWS may receive mountain yellow-legged frogs for captive rearing and husbandry pursuant to the</p>	

<b>Action</b>	<b>Responsibility</b>
<p>Biological Opinion. The following measures shall be implemented by the facility(ies).</p> <ul style="list-style-type: none"> <li>i. All proposed captive rearing activities for the upcoming season will be submitted in writing for review and approval by the FWS and the California Department of Fish and Wildlife. The FWS will be notified via email within 24 (24) hours following delivery of individual mountain yellow-legged frogs to the captive facility(ies). Notification will include numbers and lifestages of individuals delivered, condition and status of individuals, and collection location. In emergency situations, injured individuals shall be delivered first to a qualified veterinarian or FWS approved biologist.</li> <li>ii. The number of individual frogs taken into captivity annually will not exceed the capacity of the facility(ies) to provide adequate care and husbandry as determined by the FWS.</li> <li>iii. Individuals will be transferred to the captive facilities and returned to the wild using appropriate methods to avoid and minimize harassment, death and injury to the animals. Carrier containers shall keep the individuals cool, adequately hydrated, and free from injury or death due to contact with protruding or sharp objects within the interior.</li> <li>iv. Incoming individuals displaying signs of any infectious pathogens shall be immediately separated upon observation and kept physically isolated (quarantined) from any living amphibians residing in the facility(ies), including mountain yellow-legged frogs from other locations. Infected individuals will be treated by a veterinarian, or by a qualified technician under instruction of a veterinarian, until the individual is evaluated as free of the infection.</li> <li>v. Individuals will be held in an American Zoological Association-approved tank or natural display.</li> <li>vi. Once in captivity, individual frogs will not, under any circumstances, be bred in captivity without the written permission of the FWS.</li> <li>vii. All handling shall be done in an expedient manner with minimal harassment and injury to the individuals being handled. The hands and arms of all workers handling frogs shall be free of lotions, creams, sunscreen, oils, ointment, insect repellent, or any other material that may harm frogs.</li> </ul>	



<b>Action</b>	<b>Responsibility</b>
<p>6. For emergency salvage of mountain yellow-legged frogs:</p> <p style="margin-left: 20px;">a. Only pools that have been determined to be unable to continue supporting eggs or tadpoles until the wet season shall be considered for salvage actions. These pools shall be monitored by SEKI field crews to determine drying rates and assess predation pressures. The NPS will have discretion on the timeline for further action.</p>	
<p><b>Monitoring Requirements from the Biological Opinion (Appendix L in the Restoration Plan/FEIS)</b></p> <p>In order to monitor whether the amount or extent of incidental take anticipated from implementation of the project is approached or exceeded, the NPS shall adhere to the following reporting requirements. Should this anticipated amount or extent of incidental take be exceeded, the NPS must immediately reinitiate formal consultation as per 50 CFR 402.16.</p>	
<p>1. For those components of the action that will result in habitat degradation or modification whereby incidental take in the form of harm is anticipated (i.e., fish removal by piscicides), the NPS will coordinate with the FWS before each annual piscicide fish eradication action is anticipated. Once piscicide eradication is initiated, it may be followed through to completion, per the project description in the biological opinion, unless the take limit is exceeded during that action, indicating the need for immediate coordination with the FWS, and re-initiation. Updates shall also include any information about changes in project implementation that result in habitat disturbance not described in the Project Description and not analyzed in the Biological Opinion.</p> <p>2. For those components of the action that result in direct encounters between listed species and project workers and their equipment, whereby take in the form of harassment, harm, injury, or death occurs that has not been analyzed in the Biological Opinion, the NPS shall immediately contact the Chief Endangered Species Forest Division, at the FWS's Sacramento Fish and Wildlife Office at (916) 414-6600 and via email to report the encounter. If encounter occurs after normal working hours, the NPS shall contact the FWS at the earliest possible opportunity the next working day.</p> <p>3. The NPS will provide the FWS an annual report of incidental take associated with project activities covered by the biological opinion, which shall include: summary of project activities, total numbers of animals captured/swabbed/tagged/sampled, and the total numbers of individuals accidentally killed or injured. The annual report is due by February 28 of the succeeding calendar year for which the prior field season's activity is being reported.</p> <p>4. The NPS will provide either: 1) interim documents every five (5) calendar years from the date this project is approved that will include: (a) summary discussions of significant research results; (b) maps and descriptions of completed and ongoing actions; (c) results of restoration efforts, including estimates of population sizes, if appropriate; (d) other pertinent observations</p>	<p>Project lead (NPS Aquatic Ecologist)</p>

<b>Action</b>	<b>Responsibility</b>
<p>regarding the status or ecology of the species; <i>or</i> 2) regularly disseminate the required information as part of (ongoing) annual Conservation Strategy meeting updates with the FWS and other agencies per the adaptive management process established in that document.</p> <p>5. Should incidental take averages indicate higher than anticipated levels of incidental take trending above the authorized ten year incidental take estimates, the NPS will coordinate during the off season with the FWS to evaluate trends, adjust activities, or reinitiate consultation to ensure compliance under the Act.</p> <p>6. The NPS will provide, no later than ten (10) calendar years following the first complete year of implementation of project activities, information to the FWS indicating project performance, including beneficial impacts in terms of areas of habitat restored, and any population level benefits observed, trends and study findings from monitoring and research, in order to evaluate the beneficial effects to frog populations from overall project activities in the context of incidental take. This project summary report will also include: (a) summary discussions of significant research results; (b) maps and descriptions of completed and ongoing actions; (c) results of restoration efforts, including estimates of population sizes, if appropriate; and (d) other pertinent observations regarding the status or ecology of the species. Presuming SEKI begins this project this season (2016), the calendar date of the first interim project report will be February 28, 2026.</p> <p>7. The FWS must be notified as soon as possible if large numbers of the northern DPS of the mountain yellow-legged frog, and/ or Sierra Nevada yellow-legged frog are found injured, sick or dead (e.g., due to illness, chemicals, or other factors), foul play is suspected, or unauthorized take of any listed species is observed or suspected. For such incidents, notification should be made by a NPS biologist, NPS law enforcement ranger, or other qualified NPS personnel. We recognize that the activities in this project will occur in the backcountry a substantial distance from roads, telephones, and cellphone for long periods of time, so the notification should be made as soon as practicable. The report of the incident should include the date(s), location(s), habitat description, photographs, maps, preserved specimens (if possible), and any other pertinent information. The FWS contact is the Chief of the Endangered Species Division (Forest) at the Sacramento Fish and Wildlife Office at (916) 414-6621.</p>	
<b>Conservation Recommendation from the Biological Opinion (Appendix L in the Restoration Plan/FEIS)</b>	
<p>The NPS should continue to assist the FWS in implementing the Conservation Strategy and, where applicable, recovery plans for the Northern Distinct Population Segment of the mountain yellow-legged frog, Sierra Nevada yellow-legged frog, Yosemite toad, Little Kern golden trout, and the Sierra Nevada bighorn sheep.</p>	<p>Chief of Natural and Cultural Resources</p>

## **ATTACHMENT B: DETERMINATION OF NON-IMPAIRMENT**

### **Sequoia and Kings Canyon National Parks Restoration of Native Species in High Elevation Aquatic Ecosystems Plan Record of Decision**

This document evaluates and determines whether the selected action in the Sequoia and Kings Canyon National Parks' Restoration of Native Species in High Elevation Aquatic Ecosystems Plan/Environmental Impact Statement Record of Decision (Restoration Plan/EIS) will result in impairment to park resources and values. This evaluation is directed by statutes commonly referred to as the NPS Organic Act of 1916 and the NPS General Authorities Act of 1970. Per *NPS Management Policies 2006*, section 1.4.5, an action constitutes an impairment when its impact "will harm the integrity of park resources or values, including the opportunities that otherwise will be present for the enjoyment of those resources or values." Whether an impact meets this definition depends on the particular resources that will be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other past or planned future impacts. An impact on any park resource or value may, but does not necessarily, constitute impairment. An impact will be more likely to constitute an impairment to the extent that it affects a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park, or
- key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park, or
- identified in the park's general management plan or other relevant NPS planning documents as being of significance.

The park resources and values that are subject to the non-impairment standard include:

- The parks scenery, natural and historic objects, wildlife, and the processes and conditions that sustain them, including, to the extent present in the park: the ecological, biological, and physical processes that created the park and continue to act upon it; scenic features; natural visibility, both in daytime and at night; natural landscapes; natural soundscapes and smells; water and air resources; soils; geological resources; paleontological resources; archeological resources;
- Cultural landscapes; ethnographic resources; historic and prehistoric sites, structures, and objects; museum collections; and native plants and animals;
- Appropriate opportunities to experience enjoyment of the above resources, to the extent that can be done without impairing them;
- The park's role in contributing to the national dignity, the high public value and integrity, and the superlative environmental quality of the national park system, and the benefit and inspiration provided to the American people by the national park system; and
- Any additional attributes encompassed by the specific values and purposes for which the park was established.

The description of the park purpose and significance of Sequoia and Kings Canyon National Parks is found in Chapter 1 of the Restoration Plan/FEIS.

Pursuant to the NPS Guidance for Non-Impairment Determinations (October 31, 2011), non-impairment determinations must include a specific discussion for each park resource and value subject to the non-impairment standard. The discussion must include an explanation as to why the selected action's impacts will not result in impairment. Impairment findings pertain only to park resources and values, and are not necessary for visitor experience, socioeconomics, public health, park operations, or similar topics or concerns. The impact topics that are evaluated for purposes of this impairment determination include special-status species, wildlife, water quality, and natural soundscapes because there is a potential for adverse effects to these resources.

## **SPECIAL-STATUS SPECIES**

In addition to a non-impairment determination, Section 7 of the Endangered Species Act (ESA) requires all federal agencies to ensure that their actions do not compromise the existence or critical habitat of a listed species. Although habitats in the parks support many species with special status, only those species potentially affected by the actions of the Restoration Plan were considered. These species are the two species of mountain yellow-legged frogs *Rana muscosa* and *Rana sierrae*, collectively referred to as MYLFs), the Yosemite toad (*Anaxyrus [Bufo] canorus*), the Little Kern golden trout (*Oncorhynchus mykiss whitei*), and the Sierra Nevada bighorn sheep (*Ovis canadensis sierrae*).

### **Mountain Yellow-legged Frogs**

One of the primary purposes of the selected action is to restore federally endangered MYLFs (FWS 2014) to their previously occupied habitat, and make the MYLF populations more resilient to disease and climate change. Some of the specific project work would temporarily and adversely affect MYLFs because frogs and/or tadpoles could be disturbed, harassed, or killed during treatment actions. The FWS concurred with the NPS determination of *may affect, likely to adversely affect* for MYLFs. In the long term, however, treatment actions, if successful, will benefit and increase the size and resiliency of MYLFs and restore them to currently unoccupied habitat. If successful, the selected action will restore MYLF proposed critical habitat in 85 waterbodies, or 15% of the parks' 550 high elevation waterbodies that contain nonnative fish, and recover MYLF populations in up to 55 lakes basins, a significant beneficial effect and important steps in preventing the extirpation of the two species of MYLF that are present in the parks. The selected action, therefore, will not result in impairment of the Sierra Nevada yellow-legged frog or the northern distinct population segment (DPS) of the mountain yellow-legged frog.

### **Yosemite toad**

The Yosemite toad is listed as a federally threatened species (FWS 2014). Under the selected action, Yosemite toads in two of the treatment basins could be impacted by the treatment activities. The recent detections of Yosemite toads in these areas was in habitat adjacent to (outside) the proposed treatment waterbodies in Upper Evolution, and in habitat on the edge of the proposed treatment waterbodies in McGee. Thus there is low potential for Yosemite toads to be adversely affected by gill netting and electrofishing in McGee and Upper Evolution. Nevertheless, there would be potential for a small number of Yosemite toads to get caught in gill nets and/or electrofishing fields during the treatment period in these areas. There is also the potential for Yosemite toads to be affected by the piscicide treatment in two stream segments in Upper Evolution. However, the treatment would be conducted in August or September, after all Yosemite toad adults would have finished breeding (breeding occurs from mid-May to mid-August) and likely moved from aquatic to nearby terrestrial habitat, which is their typical post-breeding behavior (Kagarise Sherman 1980). In addition, many—and potentially all—tadpoles would have metamorphosed into juvenile toads, which also move from breeding ponds to adjacent terrestrial habitat. Furthermore, if any individuals are observed in treatment habitat, mitigation will be implemented to protect toads, which will further reduce the number Yosemite toads affected by the treatment. Overall, the United States Fish and Wildlife Service (FWS) concurred with the NPS determination of *may affect, likely to adversely affect* for the Yosemite toad. The selected action has low potential to result in adverse

effects on individual Yosemite toads, and will not result in population-level adverse effects. Therefore, the selected action will not result in impairment of this species.

**Little Kern Golden Trout (*Oncorhynchus mykiss whitei*)**

Little Kern golden trout occur in one of the treatment basins under the selected action (Crytes) and are not expected to be present in any of the remaining treatment basins under this alternative. The majority of treatment actions under the selected action will therefore have no effect on Little Kern golden trout. The selected action will eradicate fish from Crytes using a combination of physical methods (i.e. gill netting and electrofishing in one lake and one lake/pond complex) and piscicides (rotenone in adjacent stream and marsh areas). The fish in the lake/pond complex, considered to be a population of federally threatened Little Kern golden trout, will be eradicated and thus adversely affected. However, this population is nonnative, the basin is not in designated critical habitat, and this population is not part of the recovery plan. Recent genetic analysis shows this population is not genetically pure. If these fish are determined useful as brood stock for management and restoration of Little Kern golden trout within the recovery plan area, SEKI will work with the California Department of Fish and Wildlife (CDFW) to live-capture and move as many fish as possible to an appropriate location outside of the project area. The FWS concurred with the NPS determination of *may affect, likely to adversely affect* for the single population of Little Kern golden trout in the Crytes basin. All other Little Kern golden trout populations in SEKI will continue to be protected. Because the impacts of the selected alternative will not result in species-level effects (i.e., will not be severe for Little Kern golden trout) and will only adversely affect one basin, and all other populations of Little Kern golden trout in SEKI will continue to be protected, there will be no impairment to this species.

**Sierra Nevada bighorn sheep**

Sierra Nevada bighorn sheep occur in one of the treatment basins under this alternative (Sixty Lake) and were reintroduced in 2015 in one additional treatment basin (Laurel). Bighorn sheep are not expected to be present in any of the remaining treatment basins under this alternative. The majority of fish removal actions under this alternative will therefore have no effect on bighorn sheep. Project activities in the two areas within or nearby bighorn sheep occupied habitat may result in temporary short term disturbances. The FWS concurred with the determination of *may affect, but not likely to adversely affect* for the Sierra Nevada bighorn sheep and the determination that the use of piscicides would result in a slight modification of bighorn sheep critical habitat. Because the severity and duration of the impacts of the selected action will be low, the effects are limited to two areas occupied by sheep, the timing of the impacts will avoid critical breeding seasons, and there will not be population-level impacts, the selected action will not result in impairment to Sierra Nevada bighorn sheep.

The U.S. Fish and Wildlife Service, pursuant to Section 7 of the Endangered Species Act, concurred that the selected action in the Restoration Plan/FEIS is not likely to jeopardize the continued existence of the northern distinct population segment of the mountain yellow-legged frog, the Sierra Nevada yellow-legged frog, the Yosemite toad, the Little Kern golden trout, and the Sierra Nevada bighorn sheep

**WILDLIFE**

Vertebrates and invertebrates that occur in the project area could be affected by actions proposed in this Restoration Plan/FEIS.

**Vertebrates**

The project activities will result in short-term adverse effects on vertebrates due to the potential for disturbance, injury, or mortality to individuals from the presence of work crews, and from gill netting, electrofishing, and piscicide use. However, the selected action will result in substantial long-term beneficial effects on native vertebrates due to: (1) increased natural food sources as existing MYLF,

Pacific treefrog, and invertebrate populations increase to a larger size in response to nonnative trout removal, and (2) the potential for extirpated MYLF populations to be reestablished in treated habitat. Because the adverse effects are slight and temporary, and the long-term beneficial effects of ecosystem restoration on vertebrate populations greatly outweigh the short-term adverse effects, the selected action will not result in impairment to vertebrates.

### **Invertebrates**

Invertebrates known to occur in the project area and that use water as habitat for all or most of their life cycles (benthic and pelagic macroinvertebrate and zooplankton species, hereafter referred to as “aquatic invertebrates” and “zooplankton,” respectively) will receive the most effects by implementing the selected action. Gillnetting and electrofishing-related activities in 52 waterbodies and 15 mi (25 km) of streams result in slight and inconsequential adverse effects on individuals from project-related actions, such as walking in lakes and streams leading to disturbance, and potentially being stunned by electrofishers.

The most substantial adverse effect would occur for some invertebrate species from piscicide treatment in 33 waterbodies and 16 miles (25 km) of streams due to disturbance, injury or mortality to individuals and reduction in abundance and diversity of populations. Studies that assessed recovery of benthic invertebrate assemblages in lakes after treatment with piscicides generally showed no long-term decreases in abundance or taxa richness (Houf and Campbell 1977); no difference in taxa richness within 6 months (Blakely et al. 2005); and no differences between pre- and post-treatment samples within 1 year of treatment (Melaas et al. 2001).

There would be substantial long-term beneficial effects on invertebrates in 85 waterbodies and 31 mi (50 km) of streams contained in 21 basins. With the removal of a major predator (nonnative trout) invertebrate populations will increase in abundance, distribution, and diversity at the treatment sites. The restoration of MYLF populations to be reestablished in treated habitat would benefit ecosystem processes and native species, including invertebrates as a whole. Tadpoles cycle nutrient levels through algal grazing and waste excretion, and both frogs and tadpoles are prey to predatory invertebrates. Because the adverse effects from project-related actions are short term, and the beneficial effects greatly outweigh the adverse effects, the selected action will not result in impairment to invertebrates.

### **WATER QUALITY**

There is the potential for short-term adverse effects on water quality from project activities. Increased turbidity from walking in streams and lakes while conducting treatment activities would be minimal and localized. The use of piscicide and its neutralizer in 33 waterbodies and approximately 16 miles of streams would result in short-term adverse impacts on surface water quality. Piscicide treatments would result in a reduction of dissolved oxygen for up to 3 weeks as the rotenone degrades, and there is a slight potential for fish decomposition to alter dissolved oxygen levels. Turbidity could be altered from piscicide use and neutralization due to a temporary change in water color. Rotenone will not alter acidity or dissolved ions, however the use of potassium permanganate may alter conductivity slightly in the short term due to its ionic nature. Bacteria in water may be elevated with the decomposition of dead fish, but these effects would be mitigated due to the cooler water temperatures, oligotrophic conditions, and the seasonal mixing of lakes which allow nutrient and bacteria loads to be flushed from the treatment areas. Because the effects are slight, localized to the treatment areas or just downstream, and temporary, the project will not result in impairment to water quality.

### **NATURAL SOUNDSCAPES**

Noise levels from human voices in a localized area would be temporary and create negligible adverse effects on the natural soundscape around the project sites. As restoration is completed at each site,

components of the natural soundscape would be restored. As the work is completed, this alternative would provide for a long-term benefit to natural soundscapes. If fully successful, the sounds of frogs, insects, birds and mammals within the restoration sites would come closest to the pristine sounds that are heard in a natural environment, resulting in a beneficial effect on the natural soundscapes in these areas. Therefore, there is no potential for impairment to the natural soundscapes.

## **CONCLUSION**

The Restoration Plan/FEIS provides the long-term management direction to help restore and conserve SEKI's high elevation aquatic species and ecosystems for the next 25-35 years. Preserving and restoring native wildlife and the communities and ecosystems in which they occur is one of the guiding principles for managing biological resources in national parks (NPS 2006A).

In the professional judgment of the superintendent, the implementation of the selected action will not result in impairment of the parks' resources or values whose conservation is necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the parks; that are key to the natural or cultural integrity of the parks or to opportunities for enjoyment of the parks; or that are identified as significant in the parks' 2007 General Management Plan or other relevant NPS planning documents.

This conclusion is based on the analyses presented in the Restoration Plan/FEIS, which incorporates consideration of the parks' enabling legislation, mission statement, and desired conditions, goals and objectives of the Restoration of Native Species in High Elevation Aquatic Ecosystems Plan, input from subject matter experts, reference of scientific literature, peer-review by scientists, and the results of our consultation with the U.S. Fish and Wildlife Service under Section 7 of the ESA.

# ATTACHMENT C: WILD AND SCENIC RIVERS ACT ANALYSIS INCLUDING SECTION 7(A) DETERMINATION

## Sequoia and Kings Canyon National Parks Restoration of Native Species in High Elevation Aquatic Ecosystems Plan Record of Decision

### Background

The *National Wild and Scenic Rivers Act of 1968* (WSRA; 16 USC § 1271 et seq.) establishes the national wild and scenic rivers systems to preserve and protect selected rivers, or segments of rivers, in their free-flowing condition. Section 1(b) of the WSRA states that “certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations.”

Of the major watersheds within Sequoia and Kings Canyon National Parks (SEKI or parks) – the North Fork of the Kern River (28.9 miles) and the Middle and South Forks of the Kings River (53.6 miles) are designated as “wild,” which means rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. A short segment of the South Fork of the Kings River (7.6 miles) is designated as “recreational,” which means rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

The 2007 *Final General Management Plan/Final Environmental Impact Statement* (GMP) for SEKI establishes a vision for what the parks should be, including broadly defined desired future conditions for natural and cultural resources and visitor experiences, and includes a comprehensive river management plan for rivers within SEKI that have been designated by Congress as components of the national wild and scenic rivers system. The GMP reiterated the goals and objectives of the 1999 *Natural and Cultural Resources Plan* (RMP).

The GMP broadly established desired conditions for various natural resources. Many desired conditions are relevant to this *Restoration of Native Species in High Elevation Aquatic Ecosystems Plan / Final Environmental Impact Statement* (Restoration Plan/FEIS), including:

Populations of native plant and animal species function in as natural a condition as possible except where special management considerations are warranted.

Native species populations that have been severely reduced or extirpated from the park are restored where feasible and sustainable.

The National Park Service (NPS) will strive to protect the full range of genetic types (genotypes) of native plant and animal populations in the parks by perpetuating natural evolutionary processes and minimizing human interference with evolving genetic diversity.

Exotic species will not be introduced into the parks (except under special circumstances).

The management of populations of exotic plant and animal species, up to and including eradication, will be undertaken whenever such species threaten park resources or public health and wherever control is prudent and feasible.



The NPS will maintain all the components and processes of naturally evolving park ecosystems.

The NPS will re-establish natural functions and processes in human-disturbed natural systems in the parks unless otherwise directed by Congress. The NPS will restore the biological and physical components of human-disturbed systems as necessary, accelerating both their recovery and the recovery of landscape and community structure and function. The NPS will seek to return human-disturbed areas to conditions and processes representing the ecological zone in which the damaged resources are situated.

The NPS will, within park boundaries, identify, conserve, and attempt to recover all federally listed threatened, endangered, or special-concern species and their essential habitats. As necessary, the NPS will control visitor access to and use of essential habitats, and may close such areas to entry for other than official purposes. Active management programs (such as monitoring, surveying populations, restorations, exotic species control) will be conducted as necessary to perpetuate, to the extent possible, the natural distribution and abundance of threatened or endangered species, and the ecosystems upon which they depend. Ongoing consultation related to threatened or endangered species will occur with the U.S. Fish and Wildlife Service (FWS) should any actions take place in the habitat of such species.

The NPS will identify all state and locally listed threatened, endangered, rare, declining, sensitive, or special concern species and their essential habitats that are native to and present in the parks. These species and their essential habitats will be considered in NPS planning and management activities.

The natural and beneficial values of wetlands are preserved and enhanced.

The NPS will avoid, whenever possible, the pollution of park waters by human activities occurring within and outside parks.

NPS and NPS-permitted programs and facilities are maintained and operated to avoid pollution of surface and ground waters.

Protection of stream features will primarily be accomplished by avoiding impacts to watershed and riparian vegetation, and by allowing natural fluvial processes to proceed unimpeded.

### **Wild and Scenic Rivers within Sequoia and Kings Canyon National Parks**

Most of the parks' major watersheds include sections of river designated or eligible for designation under the WSRA. The goal of designating a river as wild and scenic is to preserve its free-flowing condition, water quality, and outstandingly remarkable values for the benefit and enjoyment of present and future generations. Outstandingly remarkable values may include scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values and individual segments may be designated as wild, scenic, or recreational. The classification of a river segment indicates the level of development on the shorelines, the level of development in the watershed, and the accessibility by road or trail. Wild river areas are those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with shorelines or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America. Scenic river areas are those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads. Recreational river areas are those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

On November 3, 1987, the entire park segments of the Middle Fork and South Fork of the Kings River (61 mi) were added to the wild and scenic river system, with 53.6 miles classified as wild and the lowest

7.6 miles of the South Fork Kings River within the park classified as recreational. The entire park segment of the North Fork of the Kern River (29 mi) was added to the wild and scenic river system and was classified as wild on November 24, 1987.

**Table K-1. Designated and Eligible Wild and Scenic Rivers with SEKI**

<b>River</b>	<b>Designation</b>	<b>Mileage</b>
North Fork of the Kern River	Wild	28.9 miles
Middle Fork of the Kings River	Wild	29.5 miles
South Fork of the Kings River – Upper Segment	Wild	24.1 miles
South Fork of the Kings River – Lower Segment	Recreational	7.6 miles
South Fork of the San Joaquin River	Eligible - Wild	11.4 miles
East Fork of the Kaweah – Upper Segment	Eligible – Wild	1.0 mile
East Fork of the Kaweah – Middle Segment	Eligible – Recreational	5.2 miles
East Fork of the Kaweah – Lower Segment	Eligible – Wild	8.0 miles
Marble Fork of the Kaweah – Upper Segment	Eligible - Wild	4.1 miles
Marble Fork of the Kaweah – Lower Segment	Eligible – Recreational	11.2 miles
Middle Fork of the Kaweah – Upper Segment	Eligible - Wild	10.9 miles
Middle Fork of the Kaweah – Lower Segment	Eligible - Recreational	7.6 miles
South Fork of the Kaweah	Eligible – Wild	11.4 miles

Designated or Eligible Wild and Scenic Rivers Potentially Affected by Proposed Project Work

While none of the proposed project work would be conducted directly in the corridor / river bed of a designated or proposed wild and scenic river, actions are proposed in tributaries to a Wild and Scenic River corridor. Proposed fish eradication basins that are watersheds and/or tributaries feeding Wild and Scenic rivers include:

- Dusy, Rambaud, Barrett, Amphitheater, Horseshoe, Slide, and Swamp for the *Middle Fork of the Kings River*.

Dusy, Rambaud, Barrett, Swamp, and Slide basins would utilize only physical treatment methods, and Horseshoe would utilize physical followed by piscicide methods. Amphitheater would utilize piscicide methods.

- Sixty Lake, Brewer, Vidette, and Upper Bubbs Creek for the *South Fork of the Kings River*

Sixty Lake would utilize piscicide methods and Upper Bubbs Creek would utilize physical followed by piscicide methods. Vidette would utilize only physical methods.

- Upper Kern, East Wright, Milestone, Laurel, and Crytes for the *North Fork of the Kern River*.

The Upper Kern would utilize physical methods and may also use piscicide methods if a fish barrier is confirmed downstream of the treatment area. East Wright and Milestone would utilize physical methods only, and Crytes would utilize physical methods followed by piscicide use. Laurel would utilize piscicide methods.

None of the proposed restoration sites are within the designated segments of these rivers, and all of the treatment sites except one are at least 1 mile from the listed river. None of the restoration activities would occur within the designated segments of any wild and scenic rivers.

One site proposed for piscicide treatment is near the headwaters of the North Fork of the Kern River, with the downstream edge of the treatment area approximately 650 feet from the designated wild and scenic river. Therefore, this evaluation was completed to address this treatment area and its potential effects on the North Fork of the Kern River.

### **Wild and Scenic Rivers Section 7(a) Evaluations**

When Congress enacted the WSRA in 1968, it sought to prevent decades of damming, dredging, and diversion from spreading to some of the nation's most spectacular waterways. Section 7(a) of the act specifies restrictions on hydro and water resource development projects and directs the managing agency to specify a process that will be followed in determining whether or not a proposed water resources project is appropriate.

Why is Free Flow Important to a River System?

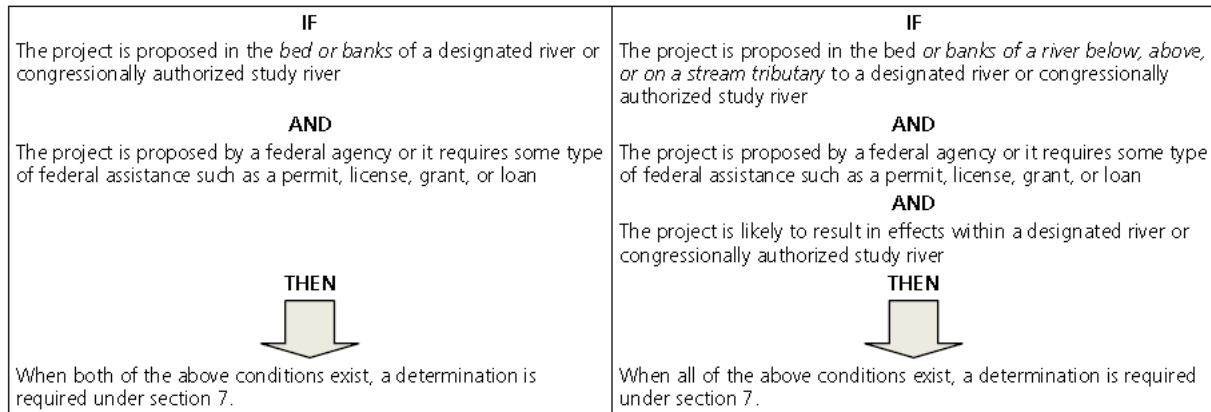
- Free-flowing rivers disperse valuable nutrients in adjacent meadows and stream habitats during flood events.
- Aquatic species require varied habitat created by a dynamic river system.
- Constriction and hardening of river channels, as caused by levees, riprap, and bridges, can alter the river's energy and natural course, causing it to erode its banks and damage valuable habitat, particularly during flood events.

Examples of water resources projects include, but are not limited to, dams, water diversion projects, fisheries habitat and watershed restoration/enhancement projects, bridge and other roadway construction/reconstruction projects, bank stabilization projects, channelization projects, levee construction, recreation facilities such as boat ramps and fishing piers, and activities that require a section 404 permit from the U.S. Army Corps of Engineers (USACE). The Restoration Plan/FEIS includes projects with the purpose of habitat restoration and/ or enhancing a particular outstandingly remarkable value.

#### Standards

The need for a section 7(a) review is determined by the standards shown in Figure K-1.

**Figure K-1. Standards to determine the need for a WSRA Section 7(a) analysis.**



**Federally Assisted Projects on Wild and Scenic Rivers**

The law prohibits any federally assisted water resources project that would have a “direct and adverse effect” on the values for which a river was added to the wild and scenic rivers system. For actions described in the Restoration Plan/FEIS, the NPS is responsible for making the final determination as to whether a proposed water resources project would have a direct and adverse impact on river values. The agency coordinates its evaluation process with other agencies that are required to review and comment on the project. Depending on the type and location of the project, such agencies might include the FWS, the U.S. Environmental Protection Agency, the U.S. Forest Service, the Bureau of Land Management, and the USACE. Review of WSRA section 7(a) projects are also coordinated with other environmental review processes, such as those required by the National Environmental Policy Act (NEPA) and the National Historic Preservation Act, as appropriate. Potential water resources projects that are found to have a direct and adverse effect on the values of a designated river must be either redesigned and resubmitted for a subsequent section 7(a) determination, abandoned, or reported to the Secretary of the Interior and the United States Congress, in accordance with the act. Since the proposed project does not involve construction, and none of the proposed or alternative work elements would occur within the bed or banks of a wild and scenic river, there would be no direct effects on the values present in the wild and scenic river.

**Federally Assisted Projects Below, Above, or on Tributaries of a Wild and Scenic River**

For federally assisted projects below, above, or on tributaries of a wild and scenic river, the river-administering agency evaluates non-hydroelectric project proposals under an ‘invade the area or unreasonably diminish’ standard. Typical projects that meet this definition are water resources projects visible from the designated river, such as dams, and upstream diversion structures because they have the potential to affect scenic, recreational, and fish and wildlife values in the designated river.

Because actions are proposed under the Restoration Plan/FEIS that are above or on the tributaries of wild and scenic rivers, a determination needs to be made if the scenic, recreational, and fish and wildlife values in the designated rivers would be affected.

**The Purpose of the Section 7(a) Determination**

The purpose of this determination is to evaluate the potential of the actions described in the Restoration Plan/FEIS to either invade or diminish the scenic, recreational, fish, or wildlife values of the wild and scenic river.

### Authority

The authority for this determination is found in section 7(a) of the WSRA. Section 7(a) states that:

No department or agency of the United States shall assist by loan, grant, license or otherwise in the construction of any water resources project that would have a direct and adverse effect on the values for which such river was established, as determined by the Secretary charged with its administration. Nothing contained in the foregoing sentence, however, shall preclude licensing of, or assistance to, developments below or above a wild, scenic or recreational river area or on any stream tributary thereto which will not invade the area or unreasonably diminish the scenic, recreation, and fish and wildlife values present in the area on the date of designation of a river as a component of the national wild and scenic rivers system.

While the WSRA does not prohibit development along a river corridor, it does prohibit activities that would interfere with the free-flowing condition of the river or degrade the values for which it was designated wild and scenic. The WSRA specifies guidelines for the determination of appropriate actions in the bed and banks of the river and either below, above, or on a tributary to a wild and scenic river.

As the designated river manager for the wild and scenic river segments located within the boundaries of SEKI, the NPS must carry out a determination of effects on all proposed water resources projects.

### Section 7(a) Determination Process

The description of the WSRA section 7(a) determination process contained in this section is adapted from a technical report by the Interagency Council (IWSRCC 2004). In conformance with the guidance contained in that report, the NPS will undertake the following steps as part of its section 7(a) determination process for nonemergency projects:

- Describe the purpose and need of the proposed project and its location, duration, magnitude, and relationship to past and future management activities.
- Analyze the potential impacts of the proposed project on the values for which the river was designated wild and scenic. This analysis will follow the guidelines provided by the Wild and Scenic Rivers Act, section 7(a) Technical Report of the Interagency Council (2004), and other applicable guidance.
- Define the likely duration of the projected impacts.
- Assess the effects of the projected impacts on the achievement or timing of achievement of the management objectives of the Restoration Plan/FEIS (based on WSRA).
- Use this analysis to make a WSRA section 7(a) determination. This determination will document the effects of the proposed activity, including any direct and adverse effects on the values for which the river was designated as wild and scenic.
- Redesign and resubmit any water resources projects found to have a direct and adverse effect on the values of this designated river for a subsequent section 7(a) determination. In the event that a project cannot be redesigned to avoid direct and adverse effects on the values for which the river was designated, the NPS will either abandon the project or advise the Secretary of the Interior in writing and report to Congress in writing in accordance with section 7(a) of the act.
- Follow WSRA section 7(a) procedures to determine if projects above or below the designated river or on its tributary streams would invade the area or unreasonably diminish the scenic, recreational, and fish and wildlife values present in the designated corridor.

## **The Purpose of the Proposed Project**

The purpose of the Restoration Plan/FEIS is to guide management actions by the NPS to restore and conserve native species diversity and ecological function to selected high elevation aquatic ecosystems that have been adversely impacted by human activities including the introduction of nonnative fish, and to increase the resistance and resilience of these species and ecosystems to human induced environmental modifications such as disease and unprecedented climate change. The overall goal of the Restoration Plan/FEIS is to restore clusters of waterbodies to a fishless state in strategic locations across SEKI to create high elevation ecosystems having more favorable habitat conditions for the persistence of native species and ecosystem processes.

The Restoration Plan/FEIS presents a range of alternative management actions to restore and conserve native species diversity and ecological function to selected high elevation aquatic ecosystems in SEKI that have been disturbed by human activities, particularly the stocking of nonnative trout. The Restoration Plan/FEIS describes the no action alternative and three action alternatives that are being considered during this planning effort, and presents an analysis of the impacts of the alternatives on the natural, cultural and physical resources in SEKI. The alternatives represent a range of reasonable and feasible options for addressing the goals and objectives of the plan and the issues and concerns raised by parks staff, other government agencies, and members of the public during the plan's scoping process. Upon conclusion of the Restoration Plan/FEIS planning effort, one of the four alternatives would become the Restoration of Native Species in High Elevation Aquatic Ecosystems Plan and guide future restoration management actions for a period of 25 to 35 years, with an internal evaluation of management effectiveness scheduled every 5 to 10 years.

## **Description of the Proposed Actions and Alternatives**

The four management alternatives are summarized below. Alternative B is the management preferred alternative.

### Alternative A: No Action

Under the "No Action" alternative, the existing high elevation aquatic ecosystem restoration effort for 25 waterbodies would be completed, maintained and monitored, but no new fish eradication activities would be initiated. Native species and ecological processes in high elevation aquatic ecosystems would continue to be monitored. Research on native species, ecological processes and their stressors would continue in accordance with NPS policy. After all treatments are completed, self-sustaining nonnative trout populations would continue to exist in 550 waterbodies (252 lakes, 235 ponds, 63 marshes) and hundreds of miles of stream.

### Alternative B: Prescription Treatment (Physical and Piscicide) Preceding Restoration

Under this alternative, a prescription (detailed plan of action) for restoration would be developed for each proposed restoration area based on the criteria for basin selection, pre-treatment surveys, habitat size, basin topography, wilderness values, visitor use and field crew safety. Prescriptions would consider the actual distribution of fish, results of amphibian surveys and whether any unique habitats were detected (such as springs). Physical treatment (gill netting, electrofishing, disturbing redds and/or temporarily covering redds with boulders) would be utilized. Piscicide treatment methods would be considered for waterbodies determined infeasible for physical treatment.

Based on current knowledge of the proposed fish eradication sites, physical treatment would be applied in 52 waterbodies (27 lakes, 24 ponds, 1 marsh; total of 492 ac/199 ha) and approximately 15 miles (25 km) of streams in 17 basins, and piscicide treatment would be applied in 33 waterbodies (4 lakes, 25 ponds, and 4 marshes; total of 142 ac/57 ha) and approximately 16 miles (25 km) of streams in 9 basins. In

addition, any unsurveyed habitat adjacent to treated lakes, ponds, marshes and streams found to contain nonnative fish would also require treatment in order to eradicate fish from the geographic area. Although the total acreage requiring treatment may change slightly based on site-specific survey information and prescription development, the number of waterbodies and stream miles identified for treatment represents the maximum number of waterbodies to be treated in this alternative. After all treatments are completed, self-sustaining nonnative trout populations would continue to exist in 465 waterbodies (221 lakes, 186 ponds, 58 marshes) and hundreds of miles of stream.

#### Alternative C: Physical Treatment Preceding Restoration

Alternative C would use physical treatment methods only to eradicate nonnative fish by gill netting, electrofishing, disturbing and/or covering redds, and blasting rock to create vertical fish barriers. In comparison to alternative B, excluded from the list of proposed restoration waterbodies are long reaches of stream, several large lakes, and interconnected lake complexes that are too large for effective physical treatment. Under this alternative, a prescription for restoration would be developed for each proposed restoration area based on the criteria for basin selection, pre-treatment surveys, habitat size, basin topography, wilderness values, visitor use, field crew safety, and the actual distribution of fish and amphibians.

Physical treatment methods would be applied in 52 waterbodies (27 lakes, 24 ponds, and 1 marsh; total of 492 ac/199 ha) and approximately 15 miles (25 km) of streams contained in 17 basins. In addition, any unsurveyed habitat adjacent to treated lakes, ponds, marshes and streams found to contain nonnative fish would be treated to eradicate fish from the entire scope of the restoration area. Although the total acreage requiring treatment may change slightly based on site-specific survey information and prescription development, the number of waterbodies and stream miles identified for treatment represents the maximum number of waterbodies to be treated in this alternative. After all treatments are completed, self-sustaining nonnative trout populations would continue to exist in 498 waterbodies (225 lakes, 211 ponds, 62 marshes) and hundreds of miles of stream.

#### Alternative D: Piscicide Treatment Preceding Restoration

Alternative D emphasizes speed in recovering habitat because mountain yellow-legged frogs (MYLF; *Rana muscosa* and *Rana sierrae*) populations are declining rapidly. To achieve this speed, only piscicide treatment would be used for nonnative fish eradication. Properly applied, piscicides can eliminate fish from targeted waterbodies in 1 to 3 years, in contrast to physical treatment methods which can take up to 6 years for lakes and up to 10 years for streams. A prescription for treatment would be developed as described in alternative B. Based on initial examination of maps, staff familiarity with the park, and discussions with scientists, piscicide treatment would be used for 85 waterbodies (31 lakes, 49 ponds, and 5 marshes; total of 634 ac/257 ha), approximately 31 miles (50 km) of streams, and connected fish-containing habitat as necessary. Although the total acreage requiring treatment may change slightly based on site-specific survey information and prescription development, the number of waterbodies and stream miles identified for treatment represents the maximum number of waterbodies to be treated in this alternative. After all treatments are completed, self-sustaining nonnative trout populations would continue to exist in 465 waterbodies (221 lakes, 186 ponds, 58 marshes) and hundreds of miles of stream.

In addition, there are a number of activities described as common to all action alternatives. These include the development of criteria for the selection of basins for restoration; the development of criteria for selection of crew camp locations; ecosystem restoration and management, including protection and rebuilding extant populations of MYLFs where opportunities still exist and reintroducing MYLFs to locations where populations have recently gone extinct; monitoring restoration work and ecosystem responses; continuing research; and fish disposal methods.

## **Methodology for Analyzing Impacts**

The impact analysis evaluates how each alternative would affect outstandingly remarkable values for designated wild and scenic rivers within or near the proposed project areas and determines if the project would “invade the area or unreasonably diminish” the standards for which the wild and scenic river was designated.

The initial question to be addressed is whether or not the proposed project invades the designated river. The term ‘invade’ is defined as “encroachment or intrusion upon.” If the proposed project does not invade the designated river, the next question to be answered, relative to the standard in section 7(a), is whether or not the proposed project would “unreasonably diminish” any of the specified values. Given that the standard implies that some diminution of values may be determined reasonable, there are two questions to consider:

1. Does the proposed project cause diminution of the scenic, recreation, and fish and wildlife values of the designated river as present at the date of designation?
2. If there is diminution, is it unreasonable? This would suggest an evaluation of the magnitude of the loss. Factors to be considered include:
  - whether the value contributed to the designation of the river (i.e., an outstandingly remarkable value)
  - the current condition and trends of the resource (If diminution is determined unreasonable, measures might be recommended to reduce adverse effects to within acceptable levels.)

Since no project work would occur directly in any wild and scenic river segment, there would be no direct encroachment or intrusion upon the river. Therefore, the evaluation is based on project work proposed in tributaries or watersheds that could potentially feed wild and scenic rivers (either designated or suitable). The rivers that could be affected by one or more of the alternatives include the Middle Fork and South Fork of the Kings River, and the North Fork of the Kern River (Figure K-2).

## **Description of Designated River Segments and Outstandingly Remarkable Values for Potentially Affected Wild and Scenic Rivers**

### Outstandingly Remarkable Values

Outstandingly remarkable values are the river-related and dependent values that make the river segment unique and worthy of special protection, and they form the basis for the river’s designation as part of the wild and scenic rivers system. The values include scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values or features. A feature must be judged to be unique, rare, or exemplary to the extent that it stands out as among the best on a regional or national basis. River and affiliated land management practices are to concentrate on protecting these values.

### Middle Fork and South Fork of the Kings River

The Kings River is the largest free-flowing river in the Sierra Nevada. Approximately 88.8 river miles of the Middle Fork, South Fork, and main stem of the Kings River were added to the national wild and scenic rivers system on November 3, 1987 (PL 100-150). The designated reaches include:

- the Middle Fork from its headwaters at Lake Helen between Muir Pass and Black Giant Mountain to its confluence with the main stem (29.5 miles)



- the South Fork from its headwaters at Lake 11599 to its confluence with the main stem (31.7 miles)
- the main stem of the Kings River from the confluence of the Middle Fork and the South Fork to the point at elevation 1,595 feet above mean sea level (this portion is outside the park and is managed by the U.S. Forest Service)

These reaches encompass the entire Middle and South Forks, which are largely in Kings Canyon National Park. The NPS manages the 61.2 miles of the Middle and South Forks within Kings Canyon National Park and the U.S. Forest Service the remaining 27.6 miles. The portions of the Middle and South Forks managed by the NPS begin in glacial lakes above timberline and flow through deep, steep-sided canyons, over falls and cataracts, and eventually become an outstanding whitewater rafting river in Sequoia National Forest. Both the Middle and South Forks flow through extensive and spectacular glacial canyons. All of the Middle Fork is within designated wilderness, as is the upper portion (24.1 miles) of the South Fork.

The lower 7.6-mile portion of the South Fork canyon is known as the Kings Canyon, giving the park its name. The Kings Canyon, including the Cedar Grove developed area, is the only segment of the Kings River accessible by motor vehicle.

*Outstandingly Remarkable Values for the Middle and South Fork of the Kings River:*

- Middle Fork of the Kings River (29.5 miles within Kings Canyon National Park) — Wild. This free-flowing river segment is wholly in designated wilderness. It is accessible only by trail and is primitive in nature, qualifying it for wild classification.
- South Fork of the Kings River (the upper 24.1 miles within Kings Canyon National Park) — Wild. This free-flowing river segment is wholly in designated wilderness. It is accessible only by trail and is primitive in nature, qualifying it for wild classification.
- South Fork of the Kings River (the lower 7.6 miles within Kings Canyon National Park) — Recreational. Lodging, campgrounds, and other amenities for park visitors are located in or near the river corridor. The river corridor also contains a road that runs parallel to the river, and three road bridges cross the river, thus qualifying it for recreational classification.

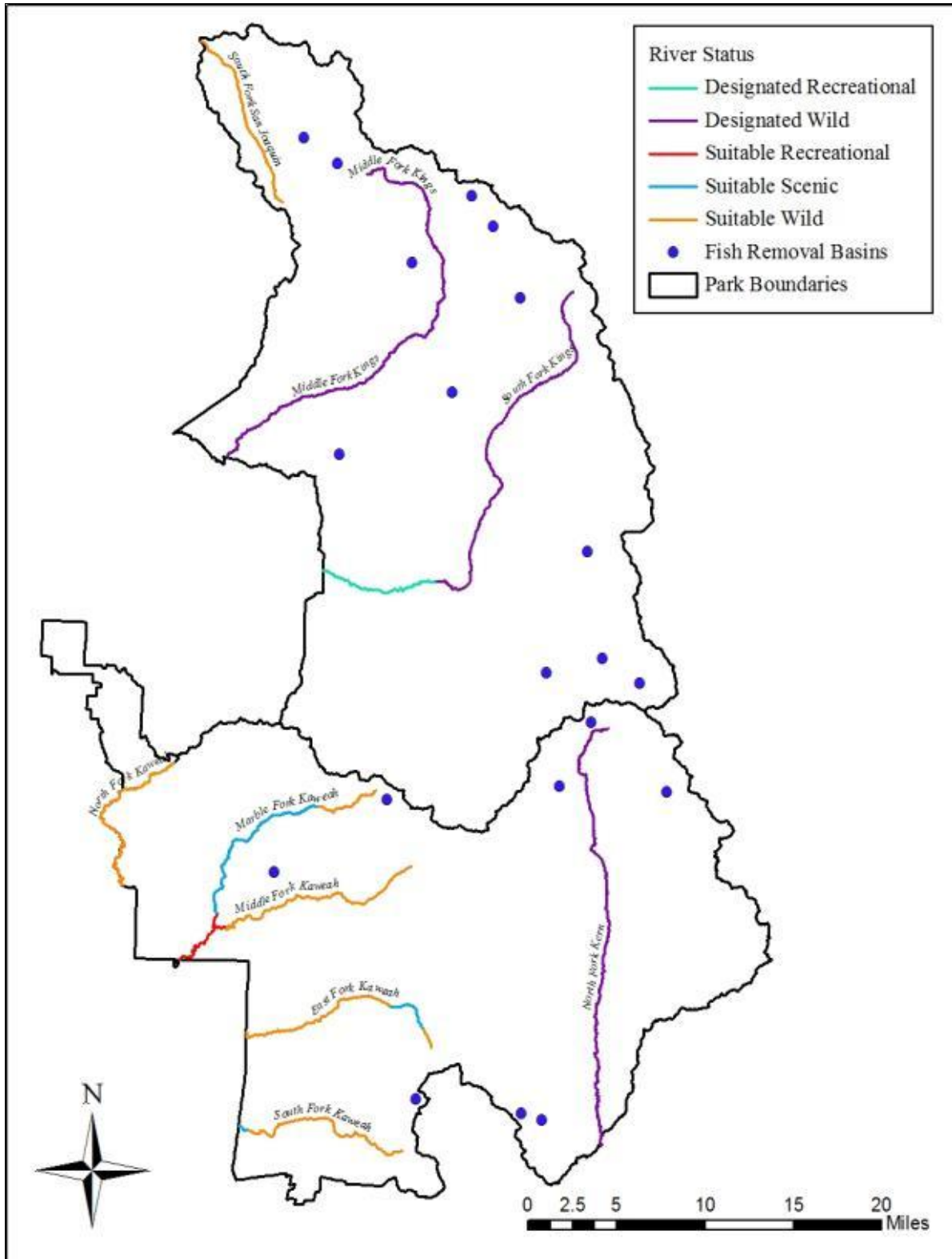
Proposed fish eradication basins that contain portions of these rivers or are watersheds feeding these rivers include:

- Dusy, Rambaud, Barrett, Amphitheater, Horseshoe, Slide and Swamp for the *Middle Fork of the Kings River*;
- Sixty Lake, Brewer, Vidette and Upper Bubbs Creek for the *South Fork of the Kings River*.

North Fork of the Kern River

The North Fork of the Kern River was added to the national wild and scenic rivers system on November 24, 1987 (PL 100-174). This 78.5-mile segment extends from its headwaters at the 12,000-foot contour just south of Harrison Pass Lake below the Kings-Kern Divide and off the west slopes of Mount Whitney in Sequoia National Park to the Tulare-Kern county line. The NPS manages the upper 28.9 miles of the North Fork within Sequoia National Park, and the U.S. Forest Service manages the remainder of the river, which flows almost entirely through national forest land, including the Golden Trout Wilderness. The upper river portion is free flowing for over 61 miles, the longest stretch of free-flowing river in the Sierra Nevada, and it is classified as wild. The lower 17.5-mile stretch managed by the U.S. Forest Service is classified as recreational due to road accessibility and minor impoundments.

Figure K-2 Locations of proposed fish eradication basins in relation to Designated and Suitable Wild and Scenic Rivers in SEKI.



*Outstandingly Remarkable Values for the North Fork of the Kern River:*

- North Fork of the Kern River (the entire 28.9 miles within Sequoia National Park) — Wild. This free-flowing river segment is wholly in designated wilderness. It is accessible only by trail and is primitive in nature, qualifying it for wild classification.

Proposed fish eradication basins that contain portions of these rivers or are watersheds feeding these rivers include:

- Upper Kern, East Wright, Milestone, Laurel, and Crytes for the *North Fork of the Kern River*.

**Does the Proposed Project “Invade” the Wild and Scenic Rivers?**

None of the proposed restoration sites are within the designated segments of these rivers. All of the sites proposed for piscicide use, except one, are far from designated wild and scenic rivers or river segments. The site in Upper Kern basin is proposed for piscicide treatment and is near the headwaters of the North Fork of the Kern River, which is designated as “Wild” under the WSRA. The furthest downstream points in the two streams proposed for piscicide treatment are approximately 200 meters and 250 meters upstream of the wild and scenic river boundary. While no work would occur directly within designated sections of these rivers, proposed fish eradication basins would be located within the watersheds feeding these rivers.

None of the alternatives would affect the free-flowing character of any designated wild and scenic river. Outstandingly remarkable values which could be affected by project activities include scenic, recreational fish, and wildlife. Impacts are evaluated in general terms of whether they would be beneficial or adverse to these outstandingly remarkable values. Beneficial impacts would result from actions that protect and enhance these values, while adverse impacts would result from actions that reduce those values. The duration of the impact considers whether the impact would be temporary and/or associated with transitional types of activities or if the impact would occur over a longer period and alter the outstandingly remarkable river values.

Because none of the project work would occur within a wild and scenic river corridor, the flow chart in Figure K-3 was used to determine if a section 7(a) determination is warranted. Because the project has the potential to affect recreation, fish, and wildlife values present in the wild and scenic river, a section 7(a) determination is included using the following methodologies in Table K-2.

**Table K-2. Wild and Scenic Rivers Impact and Intensity Descriptions**

Impact Intensity	Intensity Description
Negligible	Impacts would not be detectable to most visitors and would have no discernible effect on a river’s outstandingly remarkable values.
Minor	Impacts would be slightly detectable to some visitors but are not expected to have an overall effect on a river’s outstandingly remarkable values.
Moderate	Impacts would be clearly detectable by many visitors and could have an appreciable effect on a river’s outstandingly remarkable values.
Major	Impacts would have a substantial and noticeable effect to most visitors or the river’s outstandingly remarkable values.

Short-term—Impacts occur during project work; Long-term—Impacts are ongoing after project work is completed.

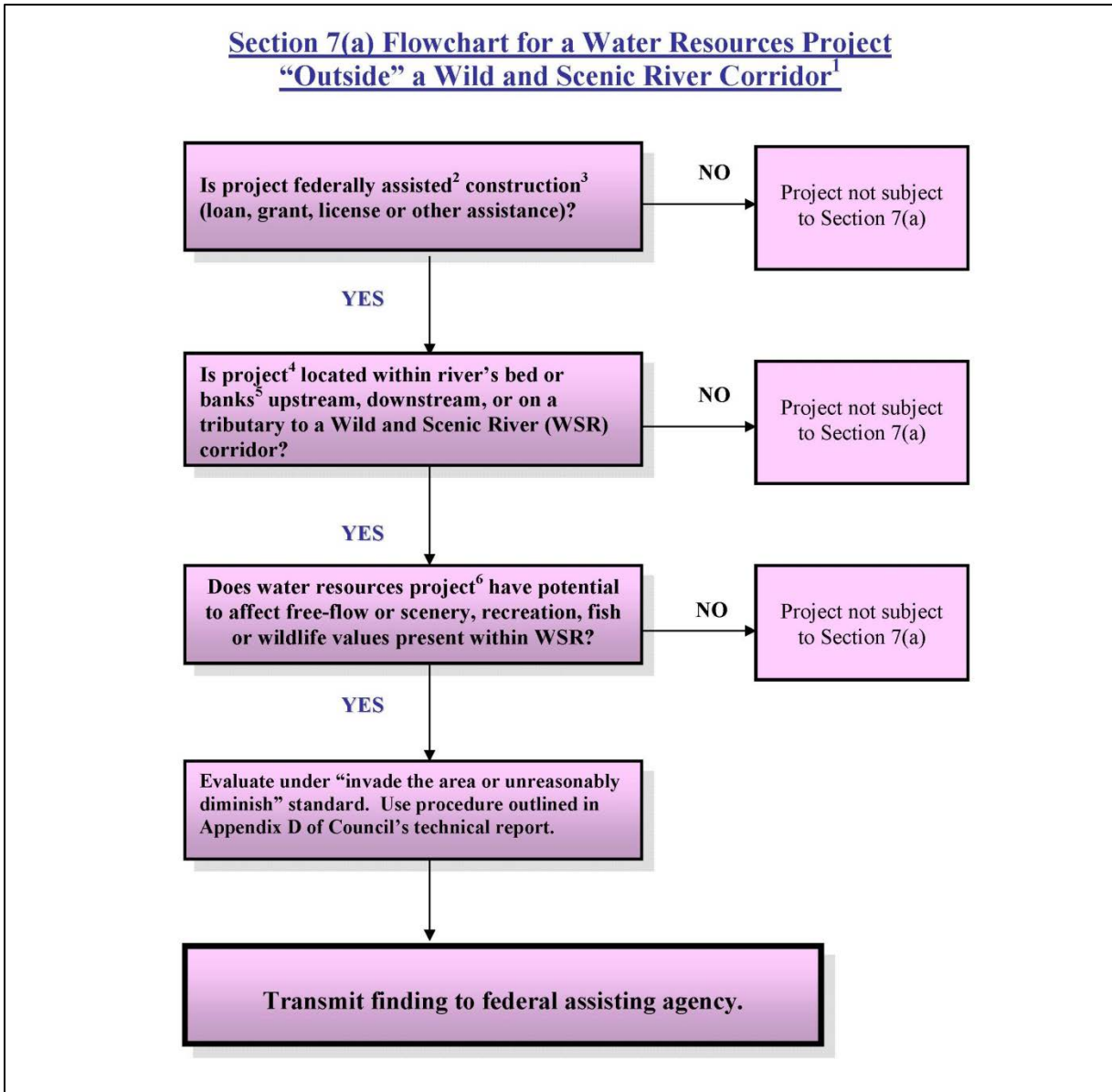
## **Impact Analysis of Outstandingly Remarkable Values Under Each Alternative**

### Impacts of Elements Common to All Alternatives

*Impacts on Outstandingly Remarkable Values (Scenic, Recreational, Fish and Wildlife):* Crew camps, helicopter use, restoration of mountain yellow-legged frogs, monitoring, research, and fish disposal would have no direct effects on designated ORV because none of these activities would occur within designated river segments. Stock use would pass through river corridors. These trips would be minimal but sometimes would involve overnight stays. In upper basin areas upstream from wild and scenic rivers, there would be no on scenic values because crews working and camping in project areas would not be visible from a wild and scenic river or its banks. Recreational, fish, and wildlife values in areas of upstream of wild and scenic river segments would be changed as ecosystems are restored, primarily due to an increase in opportunities to view native wildlife; and these changes would have the potential to spread into the designated wild and scenic river segments in the future. This would result in beneficial effects to the recreation, fish, and wildlife ORV.

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Figure K-3 Flowchart for a water resources project “outside” a wild and scenic river corridor.



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<sup>1</sup> **A wild and scenic river (WSR)** means a river and the adjacent area within the boundaries of a component of the National Wild and Scenic Rivers System pursuant to section 3(a) or 2(a)(ii) of the Wild and Scenic Rivers Act (WSRA). **Outside** the corridor means a project located upstream, downstream or on a tributary to a WSR.

<sup>2</sup> **Assistance** means loan, grant, license, or other assistance in the construction of any water resources project.

<sup>3</sup> **Construction** means any action carried on with Federal assistance affecting the free-flowing characteristics of a WSR.

<sup>4</sup> **Water resources project** means any federally assisted construction that would affect free-flowing characteristic, as defined in Section 16(b) of the WSRA (see footnote 5), or affect the scenic, recreational, fish or wildlife values within the WSR. Projects that typically meet this definition are dams, diversion structures and projects that can be seen from the WSR because they have the potential to affect these characteristics and values in the WSR. This definition also includes licenses and exemptions of hydropower projects under Part I of the Federal Power Act, as amended (41 Stat. 1063; 16 U.S.C. 791a et seq.), assuming a nexus as describe in footnote 6.

<sup>5</sup> **Bed or banks** is an interpretation of Section 16(b) of the WSRA, which defines free-flowing, in part, as “existing or flowing in natural condition without impoundment, diversion, straightening, riprapping, or other modification of the waterway.” Generally the applicability of Section 7(a) is limited to the area within the ordinary high water mark (OHWM) of the river. OHWM is defined in 33 CFR Part 328.3(e) as “...that line on the shore established by fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.”

<sup>6</sup> Requires a **nexus** between the proposed upstream, downstream or tributary project and the WSR or such project is not a water resources project for purposes of a Section 7(a) determination. Projects that have the potential to affect *free-flow, or scenery, recreation, fish or wildlife values* of the WSR are dams, upstream diversion structures and projects that can be seen from the WSR as they have the potential to affect these characteristics and values in the WSR.

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#### Impacts of Alternative A: No action

*Impacts on Outstandingly Remarkable Values:* The impacts associated with the current program are the physical removal of nonnative fish prior to restoration. There would be no work within the designated segments of wild and scenic rivers and therefore no direct effects resulting from this alternative on the outstandingly remarkable river values. However, continuing the ongoing restoration program would result in some changes to seven basins which feed, wholly or partially, the three rivers designated under the WSRA. There would be long-term beneficial effects on native fish and wildlife populations (see the following sections in the Restoration Plan/FEIS: Impacts to Special Status Species, Wildlife, and Visitor Experience and Recreational Opportunities). These effects, such as increased chances of wildlife viewing, could cascade down the basins, indirectly enhancing certain attributes of the recreation, fish, and wildlife ORV inside designated sections of the wild and scenic rivers.

*Cumulative Effects:* The 2007 GMP established a vision for the management of wild and scenic rivers within SEKI, and identified river protection measures that are employed for projects within the river boundaries (extending 0.25 mile on each side of the designated river sections), tributaries and the overall watershed. This project meets the goals established by the GMP and adheres to the river protection measures. The project areas are remote and the outstandingly remarkable values are protected in parks' wilderness areas. No past, ongoing, and future proposed actions are degrading the outstandingly remarkable values of designated wild and scenic rivers within the parks, thus there are no cumulative effects.

*Conclusion:* There would be long-term beneficial effects on recreation, fish, and wildlife ORV.

#### Impacts of Alternative B: Prescription Treatment Preceding Restoration (Preferred Alternative)

*Impacts on Outstandingly Remarkable Values:* The impacts associated with physical treatment would be the same as alternative A only expanded to include additional sites in Dusy, Rambaud, Barrett, Amphitheater, Horseshoe, Slide and Swamp, which are upstream from the Middle Fork of the Kings River; Sixty Lake, Brewer, Vidette and Upper Bubbs Basins, which are upstream from the South Fork of the Kings River; and Upper Kern, Milestone, East Wright, Laurel and Crytes, which are upstream from the North Fork of the Kern River. All of these treatment sites are outside the designated portions of these wild and scenic rivers. In addition, this alternative involves the proposed use of piscicides in selected treatment sites. All of the sites proposed for piscicide use, except one, are far from designated wild and scenic rivers or river segments. The site in Upper Kern basin is proposed for piscicide treatment and is near the headwaters of the North Fork of the Kern River, which is designated as Wild under the WSRA. The furthest downstream points in the two streams proposed for piscicide treatment are approximately 650 ft and 820 ft (200 m and 250 m) upstream of the wild and scenic river boundary.

The treatment with piscicides could result in short-term adverse effects to the recreation, fish and wildlife ORV. However, because the furthest downstream treatment site is 650 ft (200 m) upstream of the wild and scenic river boundary, these effects are unlikely to occur. Yearly treatments would involve less than 3 miles (4.8 km) of stream and generally no more than three lakes. Some years there may be no piscicide treatments in this area. Piscicides would cause mortality to all gill breathing organisms in the treatment site, which would have major adverse effects to the fish and gill-breathing wildlife upstream of the designated wild and scenic river segment. However, this effect would be short-term as native wildlife populations are expected to recover, based on similar work at other areas (see Restoration Plan/FEIS for citations).

Given the mobility of some wildlife species benefitting from aquatic restoration, the beneficial effects of this alternative are likely to extend within the designated wild and scenic river boundaries – and be

beneficial for the recreation, fish, and wildlife ORV. Effects of piscicide use on water quality are discussed in the water quality impact topic in chapter 4.

*Cumulative Effects:* In the long-term, outstandingly remarkable values would continue to be protected in the parks' wild and scenic rivers. The project areas are remote and the outstandingly remarkable values are protected in parks' wilderness areas. No past, ongoing, and future proposed actions are degrading the outstandingly remarkable values of designated wild and scenic rivers within the parks, thus there are no cumulative effects.

*Conclusion:* There would be long-term beneficial effects on the recreation, fish, and wildlife ORV.

#### Impacts of Alternative C: Physical Treatment Preceding Restoration

*Impacts on Outstandingly Remarkable Values:* The impacts associated with physical treatment would be the same as alternative B. In upper basin areas upstream of designated wild and scenic river segments, there would be decreased angling opportunities in the short and long term, and increased recreational opportunities associated with viewing native wildlife in the long-term. Within the designated wild and scenic river segments, there would be long-term beneficial effects to the recreation, fish, and wildlife ORV as native wildlife is restored by implementing this alternative.

*Cumulative Effects:* The cumulative effects would be the same as alternative B.

*Conclusion:* In the long-term there would be beneficial effects to recreational values associated with native wildlife viewing, and beneficial effects to wildlife within and adjacent to wild and scenic rivers.

#### Impacts of Alternative D: Piscicide Treatment Preceding Restoration

*Impacts on Outstandingly Remarkable Values:* This alternative would be similar to alternative B, only more areas would be treated with piscicides and work would occur over a shorter period of time. All of the sites except one are far from designated wild and scenic rivers or river segments. One site (Upper Kern Basin) proposed for piscicide treatment is near the headwaters of the North Fork of the Kern River. The furthest downstream points in the two streams proposed for piscicide treatment are approximately 650 ft and 820 ft (200 m and 250 m) upstream of the wild and scenic river boundary. The North Fork of the Kern River is designated as Wild under the WSRA. As explained in alternative B, there would be long-term adverse effects on recreational opportunities related to decreased recreation (fishing) in upper basin areas upstream of the designated wild and scenic rivers, and long-term beneficial effects on the recreation, fish, and wildlife ORV within the designated wild and scenic river segments.

*Cumulative Effects:* The cumulative effects to outstandingly remarkable values would be the same as alternative B.

*Conclusion:* There would be long-term beneficial effects on native wildlife populations. The cumulative effects would be short-term, negligible and adverse and would occur outside of the designated wild and scenic river boundaries, but long-term and beneficial cumulative effects would occur within the designated wild and scenic river boundaries.

#### **Does the proposed project unreasonably diminish the scenic, recreational, and fish and wildlife values present in the area as of the date of designation?**

The Restoration Plan/FEIS includes actions to improve native wildlife habitat within the watershed and/or tributaries of the Middle and South Fork of the Kings River, and the North Fork of the Kern River. The proposed actions would remove nonnative trout from lakes, streams, and marshes that are upstream of the designated river corridors using a variety of methods, including physical removal methods and piscicides.



There would be no direct effects to the wild and scenic river corridors. In addition, the proposed project would enhance the other recreation, fish, and wildlife values present in the area due to the restoration of native species that would occur as a result of the project work.

**Section 7(a) Determination**

Using the Restoration Plan/FEIS as the basis for the section 7(a) determination and implementing specific mitigation measures outlined in Chapter 2 of the plan, the NPS has determined that the proposed projects would not invade the Wild and Scenic Middle and South Forks of the Kings River, and the North Fork of the Kern River, or unreasonably diminish the scenic, recreational, fish, and wildlife values present in the area as of the date of designation.

Recommended:

*PO*  8/12/16  
Superintendent, Sequoia and Kings Canyon National Parks Date

Approved:

 8/23/16  
Pacific West Regional Director Date