



Fish Management Plan Environmental Assessment Finding of No Significant Impact

August 2018

This Finding of No Significant Impact (FONSI) documents the decision of the National Park Service (NPS) to adopt the preferred alternative in the Fish Management Plan Environmental Assessment (EA), which is Alternative 2: *Native Species Management*. This alternative was evaluated against Alternative 3: *Intensive Native Species Management*, and Alternative 1: *No Action (Continue Current Management)*. All three alternatives were described and analyzed in the Fish Management Plan EA. This FONSI documents the NPS determination that no significant impacts on the quality of the human environment will occur from implementation of this course of action.

Purpose

The Fish Management Plan (Fish MP) will direct long-term management for fish within lakes, rivers and streams in Mount Rainier National Park. The plan is intended to provide a programmatic framework for meeting fish management goals and objectives in all park waters. Long-term fish management goals and objectives in the plan have been designed to manage park fish populations and fishing consistent with the mission and management policies of the National Park Service and its obligation to recover threatened and endangered species, especially when recovery plans are available. The Fish MP is consistent with Management Policies (NPS 2006) and the Bull Trout Recovery Plan (USFWS 2015). Through the Fish MP, the NPS will conserve native fish populations in Mount Rainier National Park by reducing or eliminating nonnative fish. The NPS will also address other threats to native fish in the park while providing for continued recreational fishing opportunities and related visitor experiences.

Fish management goals identified by the NPS for Mount Rainier National Park include:

- Protect native (including threatened and endangered) fish populations consistent with the biological management policies of the NPS that promote the conservation of native biological integrity.
- Implement actions identified by the U.S. Fish and Wildlife Service (USFWS) and the NPS in the bull trout recovery plan (USFWS 2015). Carbon River bull trout are a genetically distinct population in the Puyallup core area and have been identified as a priority for conservation by the USFWS.
- Reduce the impact of nonnative fish so that they do not create unacceptable impacts to native fish and other wildlife, including amphibians.
- Provide for and regulate recreational fishing opportunities and visitor experiences consistent with the conservation of native species, including fish.

- Restore the natural abundance, diversity, dynamics, distribution, habitats and behaviors of native animal populations that were present prior to the introduction of nonnative fish.

Need

A new Fish Management Plan for the park is needed to address the following:

- The park has a statutory responsibility to restore and protect native fish populations and other native aquatic species and to avoid unacceptable impacts to park resources, consistent with the Endangered Species Act (ESA) and the Bull Trout Recovery Plan (USFWS 2015) including designated critical habitat within the park.
- The USFWS and National Marine Fisheries Service have listed populations of bull trout, Chinook salmon, and steelhead as threatened within Mount Rainier. In 2010, the USFWS also designated approximately 30 miles of streams in the park as bull trout critical habitat. The presence of nonnative fish and their impact and potential impact on threatened and endangered fish in the park is inconsistent with the NPS mission and management policies to protect native, including threatened and endangered, species.
- Current park-specific federal fishing regulations do not align with USFWS and NPS goals for native fish species management and recovery. For example, the current regulations provide little to no protection for native fish, including threatened and endangered species. Management that provides for recreational fishing in rivers, streams and lakes in ways that do not harm native fish is needed.
- Listed populations of fish in the park, including bull trout, have been adversely affected through competition and predation by nonnative fish in the Carbon and White rivers and elsewhere in the park.
- Changes in park fish populations and management operations are needed to enable the recovery of bull trout within the park. This plan will contribute to the goal of reducing threats to the bull trout, and to its potential recovery and delisting.
- Nonnative brook trout pose an ongoing hybridization threat to native threatened bull trout in the Carbon River watershed. Similarly, elsewhere in the park, rainbow trout present a hybridization risk to coastal cutthroat trout.
- Habitat in the park that was naturally fishless now contains nonnative fish. Ecological impacts continue to occur to aquatic communities that results in the restructuring of food webs, and changes in the abundance, diversity, distribution, and behaviors of native animal populations that were present prior to the introduction of nonnative fish.
- The results of long-term research into the ecological impacts of historic fish stocking on native fish and wildlife populations have not yet been applied as directed by NPS policies. For example, studies in the park have documented desirable amphibian population increases when nonnative fish are removed. The Fish MP is needed to guide efforts to restore natural conditions through nonnative fish removal.

Description of the Selected Alternative

The NPS has selected Alternative 2 for implementation. Selected Alternative goals include:

- Reducing or eradicating brook trout in bull trout critical habitat, beginning with headwaters' source populations.

- Eradicating introduced fish in lakes where it will most improve opportunities for native amphibian survival and persistence.
- Eradicating introduced fish in lakes where it is most feasible.
- Eradicating introduced fish where the presence of these most threatens native aquatic ecosystems.

Alternative 2 will implement revised fishing regulations consistent with NPS, Washington State, and ESA policy, while providing for continued recreational fishing opportunities. Park rivers, streams, and lakes will be managed to reduce nonnative fish populations. Because nonnative fish populations will not be removed from all water bodies, they will remain at varying levels; therefore this alternative will only partially meet NPS and ESA direction for managing fish in the park.

Summary of Selected Alternative

- Elimination of human-constructed barriers, including undersized or poorly located culverts in tributaries to the White River (same as Alternative 1).
- New fishing regulations (see below) emphasizing catch and release of native fish species and retention or harvest of nonnative fish species.
- Implementation of most actions called for in the Bull Trout Recovery Plan for the park; removal of all source populations of brook trout above known fish barriers in bull trout habitat.
- Nonnative fish suppression and/or eradication from selected areas using citizen science angling, gillnetting in lakes and lake outlets, seining in streams, electrofishing, a fish weir (trap), and piscicides. Mechanical treatments (electrofishing, gillnetting, and weir traps) will be implemented for up to five years and evaluated for success before chemical treatments are proposed.
- Phased fish removal from up to 10 lakes with reproducing fish populations on a priority basis.
- Expanded research and monitoring of native and nonnative fish populations. Use of adaptive management to alter management actions based on monitoring results.
- New emphasis on interpretation, education and outreach to communicate new fishing regulations and the purpose and goals of this Fish Management Plan.
- Use the minimum tool required for all activity in Wilderness to minimize impacts on wilderness character.

Elements of the Selected Alternative

In addition to removing barriers and continuing to conduct research and monitoring, the following additional elements will be included as part of the Selected Alternative.

New Fishing Regulations. Regulation changes are intended to reduce populations of nonnative fish through recreational fishing and to support native fish population management in the park. Overall NPS regulations for fishing in Mount Rainier National Park will include those listed in CFR 2.3 and:

- Fishing season for streams and rivers will begin the first Saturday in June and extend through October 31, with the exception of Mowich, Carbon, West Fork, White and Huckleberry Creek, which will be closed after Labor Day to protect spawning bull trout.

- Only single point barbless hooks allowed in streams and rivers.
- Continued prohibition of fishing in or near water intakes on Klickitat Creek above the White River Entrance; Laughingwater Creek above the Ohanapecosh water intake; and Edith Creek basin above the Paradise water supply intake (similar to current regulation, minus Ipsut Creek)
- No fishing in Fryingpan Creek above the confluence of the White River.
- Catch and release of all native fish (streams and rivers throughout the park).
- Retention of brook trout throughout the park, and kokanee retention in the Nisqually watershed.
- No use of lead weights.
- Continued prohibition of fishing in Reflection, Tipsoo, Frozen, or Shadow lakes (same as current regulation).

In addition, the following exceptions will apply at all park lakes:

- Multipoint hooks with barbs can be used.
- No seasonal restrictions and spawning nonnative fish may be taken.
- No catch limits for fish caught.
- Retention of all species caught.

Implementation of Bull Trout Recovery Plan (USFWS 2015). In addition to addressing the effects of partial or fully impassable culverts, park applicable actions in the bull trout recovery plan call for reducing the presence of brook trout because they pose a significant risk of hybridization within the Carbon River local population. The recovery plan recommends that specific efforts should prioritize brook trout removal in known bull trout spawning areas:

- **Lakes:** Actions to reduce brook trout populations in lakes could include physical and chemical methods (gillnetting, electrofishing, piscicide use) and supervised citizen science angling to reduce or eliminate nonnative fish. No bull trout have been detected in any of the lakes proposed for treatment as determined by gillnetting, snorkeling, and/or angling surveys.
- **Streams:** Source populations for brook trout in the Carbon River will also be reduced or eliminated. For example, Upper Ipsut Creek and Tolmie Creek have very low density brook trout populations occupying approximately 1.24 miles of headwater stream above waterfall barriers. Removing these fish via electrofishing will reduce the threat of their outmigration into the Carbon River and the possibility that they will breed with, compete with and/or displace bull trout.

Fish Removal. To minimize non-target effects, mechanical methods (electrofishing, fish weirs, and gill nets) will be used first. The method will depend on the characteristics of the waterbody, with the most efficient means used depending on existing nonnative species. The use of mechanical methods will be used first for up to five years. Analysis of success will determine the additional need for piscicide use. Mechanical and chemical methods could be used independently or in combination for fish removal.

Mechanical methods:

- *Gillnetting* will be the first method used to eradicate fish from lakes. To minimize

amphibian capture, gillnets will be placed away from the shoreline when practical. Depending on fish catch, some deep water nets could be overwintered. Before gillnets are used in another waterbody, they will be washed and decontaminated per methods described in the park's decontamination protocol (Samora et al. 2011). This protocol includes thorough cleaning of all equipment, including waders worn by biologists and nets, before use elsewhere in the park. Fish captured by gillnetting will be disposed of near the edge of the littoral zone in backcountry locations, sunk in deep lakes, or packed out of front country locations to be disposed of in a wildlife-proof dumpster that is specified and located for this purpose.

- *Electrofishing* will be done from downstream to upstream and requires repeated passes through an area to capture stunned fish and to fish within small pools, such as near rocks, under overhanging banks and/or adjacent to logs. For small streams lacking native fish populations, electrofishing will be used with lethal, rather than stun, settings to improve efficiency. Nonnative captured fish will be euthanized by decapitation or pithing (piercing the spinal cord).

Electrofishing in bull trout habitat is intended to be used only if other mechanical methods are ineffective for nonnative fish removal. If necessary, limited electrofishing in bull trout habitat will only occur between July 15 and August 15 to avoid impacts to developing eggs and alevins, and will occur no more than once per year at each location. Electrofishing in lakes and lake outlets (non-bull trout habitat and no ESA listed species present) could occur anytime from July to October, with the option for repeat visits.

- *Seining* will occur in the Carbon River watershed from July 15-August 15th. Ipsut, Ranger, June, Poch, and Tolmie creeks in the Carbon River Watershed will be seined depending on the success of citizen angling. Seining will be conducted in Carbon River treatment sites where habitat conditions allow, that is, areas with limited instream wood and velocity. Each site could be seined up to one time annually if the other methods (weir trap, above barrier electrofishing, and citizen science angling) are not effective in reducing brook trout populations after two years of effort.

All fish will be identified while trapped in the seine. Only brook trout will be dip netted and removed from the seine. The remaining native fish (such as coastal cutthroat and bull trout, coho salmon, and rainbow trout/steelhead) will be released without handling or removal from the water.

- *Fish weirs* will be used to trap fish in Ranger Creek, a tributary to the Carbon River. The park will install an upstream and a downstream fish weir near the mouth of Ranger Creek and operate it from August 1 to November 15 annually, and until no longer needed. Operation of fish weirs will coincide with headwaters area brook trout removal (via electrofishing) in upper Ipsut and Tolmie creeks. All nonnative fish will be euthanized, while all native fish will be released unharmed.

Ranger Creek is the largest tributary in the watershed with 2.24 miles of spawning habitat and both brook and bull trout. If the effort at Ranger Creek is successful at collapsing the brook trout population, a second weir could be installed in the next

largest spawning tributary in the Carbon watershed, June Creek, which also has brook trout and bull trout. These two sites were identified because of the high proportion of available habitat they represent and their relative ease of access for maintaining the trap(s). Ranger and June creeks are also perennial streams, offering spawning sites that do not run dry in drought years. Other Carbon River area tributaries (such as Falls and Spukwush creeks, the next two longest tributaries) also comprise approximately 35 percent of available habitat but may be dry in some years. Ranger and June creeks are also the most protected sites from Carbon River inundation during flooding and are the most likely long-term viable spawning sites as main river channel widening processes continue to reduce available spawning habitat in the watershed.

If needed, another potential weir site is Poch Creek, which offers some of the same characteristics as Ranger and June creeks, but which comprises a smaller percentage of habitat (<5 percent) with high densities of brook trout.

- Supervised *Citizen Science Angling* will be used to suppress brook trout in some areas in the Carbon River and its tributaries. After adult angling capture efficiency drops, some areas of known brook trout juvenile congregants will be electrofished and seined to target juvenile fish.

Groups of supervised volunteers will also fish at targeted sites throughout the Carbon River watershed to remove as many brook trout as possible and to monitor the success of fish restoration efforts via data collected on catch per unit of effort. Anglers will target Ipsut Creek, Ranger Creek, and side-channel and backwater areas of the Carbon River. The field portion of the citizen science angling project will take place on weekends between July 1 and Labor Day. Angling groups will rotate through the treatment sites visiting each site with a guide twice, once in July and once in August. Angling is intended to supplement the fish weir(s) and electrofishing efforts and to target areas where it is difficult to remove nonnative fish without harming native bull trout when using other methods.

Chemical Method (Piscicides)

- *Piscicides* will be used in addition to gillnets and electrofishing. The park will employ limited use of chemical piscicides in high elevation lakes and the White River Ponds if mechanical removal proves ineffective in eliminating nonnative fish (after up to five years of monitoring) or where mechanical treatment is infeasible.

Piscicide treatment will occur in the fall, after September 15, and will generally be used once at each site needing treatment. Among the piscicides that will be proposed for use are rotenone and, if available, antimycin. Rotenone (derived from plants) and antimycin (derived from bacteria) are the only piscicides that have been approved by the Environmental Protection Agency (EPA) for removal of fish from fresh water habitats.

Once effective fish elimination has been achieved, potassium permanganate is used to neutralize areas treated with rotenone. Potassium permanganate is a chemical used to treat drinking water supplies and has minimal effects on oxidation, colors, and odors (see Environmental Consequences section).

Antimycin is neutralized with the same chemical but dissipates more readily through oxidization. Potassium permanganate quickly reacts with a variety of rotenone compounds diminishing it to concentrations that are not harmful to aquatic or terrestrial organisms. In streams, normal flow from riffles and cascades quickly re-oxygenates water.

To minimize the use of piscicides, mechanical methods will be attempted first for all targeted lakes. Beginning with mechanical methods will allow the NPS the opportunity to learn more about each individual fish population, while decreasing the population size. Mechanical methods may potentially reduce the number of piscicide treatments needed, or may eliminate the need for piscicide treatments altogether. In this plan, mechanical methods are proposed for even some large deep lakes (Golden Lakes, 24 meters). Nonetheless, for larger lakes with complex habitat and other characteristics that may make removal using mechanical methods difficult or impossible, use of piscicides may be necessary.

If piscicides are necessary in lakes where nonnative trout coexist with native trout, the impacts to native trout will be mitigated by prior removal of native fish and reintroduction post treatment to the extent practical. There are only three ponds in the White River Watershed where this potential exists, and genetic testing is underway to confirm whether both native and nonnative fish are present.

Lakes and Streams Targeted for Fish Removal. Fish will generally be removed from the target lakes. Other water bodies, such as the ten additional lakes proposed for fish removal in Alternative 3 and the 15 lakes with no scheduled fish removal, will likely retain fish for an indefinite period, pending actions in priority lakes, streams and rivers. Some water bodies, including those where fish were never stocked or have already been removed (Harry Lake, Upper Palisades, and Hidden lakes) will remain fishless. In addition to the water bodies (10 of 35 lakes with reproducing nonnative fish populations), more than 1565 linear meters (0.97 miles) of stream segments will also be targeted for nonnative fish removal in the Selected Alternative.

Criteria for Fish Removal. To meet the goals regarding fish eradication identified for Alternative 2, the following are among the criteria the park has used to prioritize fish removal actions:

- Effects on rare, threatened species (*Reduce or eradicate brook trout in bull trout critical habitat, beginning with headwaters' source populations.*)
- Threat to amphibians/improve climate change resilience for sensitive amphibians (*Eradicate introduced fish in lakes to improve opportunities for native amphibian survival and persistence.*)
- Feasibility of fish removal/potential for success using mechanical methods (*Eradicate introduced fish in lakes where it is most feasible.*)
- Threat to native ecology of lakes (*Eradicate introduced fish where the presence of these most threatens native aquatic ecosystems.*)

In the Selected Alternative, initial actions will take place in areas where the distance to adjacent amphibian habitat and proximity to bull trout will have the greatest beneficial impact. Lakes with

the highest probability of success, for instance, are lakes that are shallow and have limited (<400 m/ 0.25 miles) connected inlet and/or outlet streams.

Based on the priorities noted above, park biologists have identified the likely number of lakes and stream reaches that will be targeted for fish removal under each criterion.

1. Identify lakes with nonnative fish. (There are 35 lakes with nonnative fish.)
2. Identify lakes with brook trout. (There are 15 lakes with brook trout.)
3. Identify known stream reaches with brook trout above native fish barriers. (There are 7 reaches with brook trout above natural fish barriers.)
4. Identify/prioritize overlap of headwater source brook trout populations in step 2 and 3 and bull trout critical habitat. (There are 12 areas where bull trout overlap with brook trout.)
5. Identify all potential treatment lakes which improve climate change resilience for sensitive amphibians. (There are 20 lakes where climate change resilience for amphibians could be improved.)
6. Omit or reduce priority sites with habitat determined to be more complex leading to a lower probability of successful eradication via mechanical or chemical treatments. For connected lakes and streams, this will be those that have 2 or more connected lakes, or are more than 25 acres, more than 25m deep, and/or longer than 400 m. (There are 19 sites where there is a lower probability of eradication based on these criteria.) Prioritize lake sites with the best chance of successful fish removal via mechanical methods (<7 acres area, <0.25 miles (400m) of connected stream habitat). (There are 10 lakes where fish removal with mechanical methods will work best.)
7. Prioritize stream sites based on location. Carbon River tributaries are first priority and stream length determines method (>0.31 miles (500m) of connected habitat will require chemical use, >1000m omitted)
8. Prioritize the twenty lakes and four stream treatment sites based on above criterion 1-7 in order.

Based on the above priorities, initially fish will be removed from 10 lakes. These lakes include all lakes currently containing brook trout within watersheds occupied by federally threatened bull trout. Brook trout have the potential to hybridize with bull trout. Recreational fishing opportunities will continue in 25 lakes. Gillnetting and electrofishing will be conducted at high priority sites for up to five years. Once removal method assessments were completed, further analysis will determine the need for piscicide use.

Expanded Research and Monitoring. A monitoring and adaptive management program will be developed. Through a continual process of improvement using adaptive management, the NPS will analyze management decisions by considering options, implementing actions, evaluating results, conducting additional research, and then using this information to modify future management actions.

Monitoring results will be used to provide site specific information to inform future management actions, including modifying existing actions and/or regulations that may not be having the desired effect, based on analysis of success. Planning of management actions, implementing those actions, learning from those actions, and then using what was learned to plan new or modified management actions would ensure a continuous cycle of improvement.

Based on monitoring, the park will determine whether goals for native and nonnative fish are being met. Under an adaptive management strategy, existing actions will continue unless they are not meeting the goals for native and/or nonnative fish populations. If implementation shows fish management actions are not meeting the goals, additional management actions, such as those identified in Alternative 3, will be evaluated, including conducting future environmental impact analyses.

The park will also continue to modify management actions as needed if monitoring shows unanticipated adverse effects on native fish species. For example, if surveys caused harm to individual bull trout, actions will be modified to omit the harm. In general, the effects of modifying management actions to remove nonnative fish from lakes will outweigh small, short-term anticipated effects on amphibians and other species.

Monitoring data associated with each action undertaken will be collected to document successful native fish and amphibian recovery. The following are examples of monitoring that may be done:

- Amphibian and invertebrate diversity and abundance in lakes before and after fish removal
- Fish population genetics monitoring and assessment
- Brook trout abundance in Carbon and White rivers at treatment sites
- Brook trout movement and spawning assessment in Carbon River
- Response of native fish to nonnative fish reduction/eradication
- Habitat utilization before and after fish passage barrier removal
- Angler volunteer self-reporting cards consisting of species and size of fish caught, location, time, method, and mortality.

Educational and Interpretive Strategies. The following educational strategies will be part of the Selected Alternative:

- Creating a fishing guide with park fishing regulations and additional information including fish species present in the park, appropriate methods to handle fish, and aquatic invasive species information.
- Using the citizen science model to recruit and train nonnative fish removal program volunteers to help with stream and lake fish removal projects.
- Creating or taking advantage of smart phone applications designed to provide information about park fishing regulations and/or special status fish species and habitats.

Collaboration with Partners. The park will also collaborate with partners to implement the Fish Management Plan and work with stakeholders to promote native fish recovery. Collaboration efforts may include identifying barriers to restoration of native fish species and ecosystem recovery within the park, and where possible, addressing issues outside the park such as fish stocking practices and barriers to fish migration downstream of the park. For example, the park could work with state and tribal fisheries managers to replace kokanee stocking in Alder Lake with native cutthroat trout stocking.

Current partners include:

- Washington Department of Fish and Wildlife
- NPS Water Resources Division
- Native American Indian tribes (Nisqually, Muckleshoot, Puyallup)
- U.S. Fish and Wildlife Service
- National Marine Fisheries Service

The park also cooperates with universities for research and monitoring and has recently begun collaborating with angling groups, such as the Hi-Lakers and Trailblazers.

Other Alternatives Evaluated

Alternative 1: No Action: Continue Current Management

This alternative will continue existing fish management policies and practices in the park. This alternative is intended to serve as a baseline to compare the action alternatives.

In Alternative 1, nonnative introduced fish would continue to compete with, displace, hybridize with and predate on native and threatened fish and other aquatic species in each of the nine major watersheds in the park. There would continue to be no brook trout in three high elevation lakes, where they were previously removed (Harry, Upper Palisades, and Hidden lakes). Under Alternative, 1:

- Current fishing regulations would continue to be inconsistent with NPS native species management policies and will not fully protect threatened species, such as bull trout, from harvest.
- There will be ongoing removal of human-constructed barriers to native fish migration into historically occupied habitat.
- The park will continue to study and monitor native and nonnative fish populations to better understand how to manage them.
- This alternative will partially meet the goals of the Bull Trout Recovery Plan.

Alternative 3: Intensive Native Species Management

In addition to actions described in the Selected Alternative, Alternative 3 included:

- Expanded implementation of nonnative fish control and/or eradication from park lakes and streams. As in the Selected Alternative, methods could include gillnetting, electrofishing and chemical piscicides.
- Implementation of all of the actions in the bull trout recovery plan, including conducting a feasibility study for potential translocation of bull trout into the Puyallup and Mowich watersheds to enhance existing populations.
- Potential reintroduction of steelhead, Chinook, and coho salmon where these are documented to have been extirpated from suitable habitat.
- Phased fish removal from up to 20 lakes with reproducing fish populations on a priority basis.

Preliminary Alternatives and Actions Considered But Dismissed

Under the National Environmental Policy Act (NEPA) alternatives may be eliminated from detailed study based on the following reasons [40 CFR 1504.14 (a)]:

- Technical or economic infeasibility;
- Inability to meet project objectives or resolve need for the project;

- Duplication of other less environmentally damaging alternatives;
- Conflicts with an up-to-date valid plan, statement of purpose and significance, or other policy; and therefore, will require a major change in that plan or policy to implement; and
- Environmental impacts too great.

The following proposed actions identified during public and internal scoping were dismissed:

Immediate Removal of All Nonnative Fish from the 35 Lakes with Reproducing Populations. This action was discussed and considered internally, but dismissed for several reasons. This action would require starting small and scaling up fish removal operations based on budget, resources, and timing. Since only small areas have been treated as study sites so far, there is uncertainty about the success of treatment in larger, more complex areas.

Install Aquatic Invasive Species (AIS) Inspection Stations to Prevent AIS In Park Lakes. Limit or Prohibit Boating to Safeguard against AIS Introduction. Interdisciplinary team members reviewed this suggestion from public scoping but determined that because there are only a few lakes in the park that are used and/or open to non-motorized boating, creating, installing, staffing and funding aquatic invasive species inspection stations will not address the problem from a small number of non-motorized kayaks, canoes, row boats and other inflatable watercraft. Similarly, prohibiting boating on the one lake accessible by motorized vehicles that currently allows boating (Mowich Lake) will not measurably affect the outcome for aquatic invasive species in the park.

Elimination of Recreational Fishing in the Park. Public and internal comments suggested the elimination of recreational fishing in the park. This alternative was considered but dismissed because it will not improve native fish habitat or populations. Continuing to allow recreational fishing for nonnative fish is part of the action alternatives because anglers will continue to reduce nonnative fish in a small way in park lakes that naturally evolved without fish. With proposed changes in regulations to protect rare, threatened and endangered trout and salmon, in combination with other methods, recreational fishing will increase pressure on nonnative fish populations and benefit native fish.

Manipulation of Natural Barriers to Improve Special Status Fish Populations. The manipulation of natural barriers to fish passage was identified through internal scoping. This action will not benefit native fish, will not be consistent with NPS policy, and will not meet the purpose and need for the plan.

Requiring a State Fishing License. A state license is not currently required because the NPS retains exclusive jurisdiction for law enforcement authority in Mount Rainier National Park. Requiring a state fishing license could discourage people from fishing and reduce overall angling pressure as an effective tool for managing nonnative (and native) fish populations. This option, which was brought up during internal scoping, was dismissed because fishing will be encouraged as a tool to implement parts of the proposed action. If fewer fish are caught, the effectiveness of the proposed alternatives to reduce nonnative fish, and on reducing the adverse effects of nonnative fish on native fish and amphibian populations, may be limited.

Imposition of Stiff Penalties for Using Live Bait. Public scoping suggested the institution of stiff penalties for using live bait. Mount Rainier National Park does not have the authority to impose fines for infractions. Fines are set by courts.

Stocking of Non-Reproducing Fish. Use of Gill Netting, then Replanting with Native Trout (Cutthroat). Stocking of native rainbow trout in Deadwood Lake, a very popular recreational fishing area, was suggested during public scoping as a way to prevent future illegal replanting of fish. This suggestion was briefly considered but dismissed because it is contrary to NPS management policies. Stocking non-reproducing fish in lakes and/or stocking with fish native to the watershed but not present originally will also have more adverse effects on native fish and amphibians than the alternatives considered in this plan.

Not removing Nonnative Fish. Not removing nonnative fish was suggested during public scoping. However not removing nonnative fish will be inconsistent with the objectives of this plan and will have more adverse effects on native fish and amphibians than the alternatives considered in this plan.

Stock Nonnative Non-reproducing Brook Trout. Stocking non-reproducing (YY) brook trout is currently being explored as a new method of reducing brook trout populations over the long-term. This method, developed by the Idaho Department of Fish and Game, relies on hatchery broodstock whose progeny have no X chromosomes. They are produced by rearranging chromosomes, rather than by genetically modifying or gene splicing fish. Therefore, they can produce only male progeny. In theory, over time, if enough of these males were stocked and mated, the population will skew toward males and eventually become a non-reproducing population (Schill 2016). In a recent experiment, the fish were developed, successfully bred, and all progeny were XY males.

However the success of the introduction in reducing brook trout has yet to be confirmed. Further research is planned (Schill 2016). Because this method is still being tested, and additional confirmation of the potential for breeding with bull trout has not been addressed, it was discussed during internal scoping but dismissed from additional consideration. If this method is later proved to be effective in reducing difficult to eradicate brook trout populations, the park could undertake new environmental impact analysis to reconsider it.

Decision Reached and Rationale

The NPS selected Alternative 2, Native Species Management because it meets the purpose and need of the plan by:

- Implementing revised fishing regulations consistent with NPS, Washington State, and Endangered Species Act policies, while providing for a continued range of recreational fishing opportunities.
- Implementing actions to remove brook trout in bull trout critical habitat, as identified by the U.S. Fish and Wildlife Service (USFWS) and the NPS in the bull trout recovery plan (USFWS 2015).
- Removing nonnative fish in 10 previously fishless lakes to restore aquatic ecosystems.

Although Alternative 3 would also meet the purpose and need of the plan, more use of piscicides would be required due to the habitat complexity in the 10 additional treatment lakes and streams; more funding and staff would be required to implement actions over a sustained period (more than 10 years); and an intensive planning effort would be required to evaluate the potential translocation of bull trout into the Puyallup and Mowich watershed, combined with potential reintroduction of steelhead, Chinook, and Coho salmon where these are documented to have been extirpated from suitable habitat.

Alternative 2 will enable park staff to determine how aquatic ecosystems respond to specific management actions, and provide critical information about the potential feasibility of full nonnative fish removal in the park.

Why the Selected Alternative Will Not Have a Significant Effect

After considering the environmental consequences described in the EA, the NPS has determined that the Selected Alternative and its associated actions will not have a significant effect on the quality of the human environment considering the context and intensity of impacts (40 CFR 1508.27). Thus, an environmental impact statement will not be prepared. This finding is based on the following:

- The Selected Alternative has a wide range of beneficial and adverse effects (see Measures to Minimize Environmental Harm below).
- The finding of no significant environmental effects is not biased by the beneficial effects of the action.
- The Selected Alternative will not adversely affect public health or safety.
- The Selected Alternative will not result in significant effects on the unique natural resource characteristics of the area, including prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.
- The effects on the human environment are known, and there were no controversial impacts or aspects of the proposed project that surfaced during the environmental analysis process. There is no scientific controversy over the impacts of the project.
- The Selected Alternative will have *no effect* on historic properties. Mitigation measures cited in the EA (Attachment A) will prevent loss or destruction of significant scientific, cultural, and historical resources.
- The Selected Alternative will either be *not likely to adversely affect* (northern spotted owls, marbled murrelets, steelhead, Chinook salmon) or will *be likely to adversely affect* (bull trout) species listed or proposed for listing as endangered or threatened or their critical habitat as determined under the Endangered Species Act of 1973.
- No significant cumulative effects and no highly uncertain, unique or unknown risks were identified during preparation of the EA or during the public review period. The Selected Alternative neither established an NPS precedent for future actions with significant effects, nor represents a decision in principle about a future consideration. The effects analysis shows that the effects are known, and do not involve unique or unknown risk.
- The Selected Alternative will not violate federal, state, or local laws or requirements for the protection of the environment.

Public Involvement

The park received 26 correspondence letters during the public scoping period from May 5 to June 6, 2016. Most (21) of these were received via the National Park Service (NPS) Planning, Environment and Public Comment (PEPC) website (<http://parkplanning.nps.gov>). Others were received via email (3), and hard copy (4). Three letters were received from other public agencies (U.S. Forest Service: Mount Baker-Snoqualmie National Forest, Washington Department of Fish and Wildlife Service, Washington State Historic Preservation Office); three were received from representatives of non-profit organizations (National Parks Conservation Association, Mount Rainier National Park Associates, Tahoma Audubon Society); one was received from an individual affiliated with the University of Washington; six were received from individuals affiliated with other organizations (Washington Hi-Lakers, Trail Blazers); and 12 were received from individuals not identifying affiliation with organizations.

The formal public review period for the EA was open for 30-days (September 12 – October 12, 2017). Thirteen comment letters were received, all via the Planning, Environment and Public Comment (PEPC) website. In addition to one duplicate comment, which was also emailed. All those who commented were supportive of Alternative 2 and 3. Concern statements/questions were developed from comment letters, which are provided with NPS responses in Attachment B.

Agency Consultation

Washington State Historic Preservation Office (SHPO). Because there will be no effect on archeological, historic or ethnographic resources, no additional consultation with the SHPO is required. Mitigation measures for ground disturbance will be used to avoid impacts to archeological resources, while other built resources, including the NHL, will not be affected by the proposed plan.

U.S. Fish and Wildlife Service. In accordance with the Endangered Species Act, the National Park Service contacted the U.S. Fish and Wildlife Service to determine which federally listed special status species should be included in the analysis.

The NPS provided the draft Environmental Assessment (EA) to the USFWS on March 31, 2017 and provided additional information necessary to initiate consultation on May 22, 2017. On December 21, 2017, the USFWS concurred with the determinations of effect for the marbled murrelet and northern spotted owl (may affect, not likely to adversely affect) and with the determinations of effect for bull trout (may affect, likely to adversely affect).

National Marine Fisheries Service. The NPS provided the Environmental Assessment (EA) to the NMFS and initiated informal consultation on August 14, 2017. On March 27, 2018, the NMFS concurred with the NPS determinations of effect for Chinook salmon and Puget Sound steelhead trout and their critical habitat (may affect, not likely to adversely affect).

Native American Indian Tribes. The six federally recognized tribes known to have traditional association with Mount Rainier include the Muckleshoot Indian Tribe, Puyallup Tribe of Indians, Cowlitz Indian Tribe, Squaxin Island Tribe, Nisqually Indian Tribe, and the Yakama Indian Nation. Between February and March 2016, letters to associated tribes were sent to announce the proposed preparation of the Fish Management Plan. Two tribes provided comments during scoping, and several others were present at a meeting where specific information about the project was presented and discussed. During scoping, the Nisqually Indian Tribe expressed a

preference for Alternative 2 and a request that no chemicals enter their waterways downstream. No comments were received from Native American Indian Tribes during public review of the EA. The proposed action will not limit access or numbers of fish downstream and as such will not have an adverse effect to reserved treaty rights and other trust responsibilities that the NPS has to its traditionally associated tribes.

Finding

On the basis of the information contained in the EA as summarized above, the NPS has determined that implementing the Selected Alternative is not a major federal action nor is it an action without precedent or similar to an action that normally requires an Environmental Impact Statement (EIS). The conclusions of non-significance are supported by the conservation planning and environmental impact analysis completed and the capability of listed mitigation measures to reduce or eliminate impacts. No adverse effects to cultural or historical resources will occur; and there are no unacceptable impacts. This determination also included due consideration of the minor nature of agency and public comments. Therefore, in compliance with the National Environmental Policy Act, an EIS will not be prepared, and the plan may be implemented immediately.

Recommended:

 8/23/2018

Superintendent Date
Mount Rainier National Park

Approved:

 8/28/18

Regional Director Date
Pacific West Region

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ATTACHMENT A

Mitigation Measures to Minimize Environmental Harm

All mitigation measures will be implemented for the Selected Alternative at Mount Rainier National Park to ensure resource protection, and promote visitor enjoyment.

Note: *The project manager is the Contracting Officer's Representative for the building construction and/or the park's Chief of Maintenance (for park-implemented actions)*

Resource	Selected Alternative Impacts	Measures to Avoid, Minimize or Mitigate Impacts	Responsibility
Hydrology and Water Quality	There will be a range of small effects on hydrology and water quality from actions to minimize the effects of and to remove nonnative fish from park watersheds, including the Carbon and White rivers. Over time, measures of water quality will improve and there will be fewer adverse effects on hydrology and water quality from culvert replacement and from nonnative fish removal.	<ul style="list-style-type: none"> • Employing appropriate best management practices when working in or near water. Comply with Washington State Hydraulic Code. • Using vegetable-based hydraulic fluid in all machinery. • Employing appropriate best management practices when working in or near water. • Locating staging areas away from or protecting nearby surface water resources. • Using temporary sediment-control devices such as filter fabric fences, sediment traps, or check dams as needed during culvert replacement to minimize fine sediment delivery to streams. • Minimizing soil disturbance, and reseeding or revegetating with native plants in disturbed areas as soon as practical. • Retaining silt fencing in disturbed areas until stabilization (by reseeding or revegetation). • Installing protective construction fencing around, adjacent to, or near wetland and/or riparian areas to be protected. • Limiting the duration of in-water work as much as possible. • Timing projects undertaken adjacent to or near wetlands to occur during the dry season, usually late summer. • Developing and implementing a Stormwater Pollution Prevention Plan (SWPPP) for construction activities to control surface runoff, reduce erosion, and prevent sedimentation from entering water bodies during construction. • When overnight stays are needed, fish crews will stay in backcountry or wilderness campsites when possible and will use Leave No Trace® camping techniques. 	Project Manager Aquatic Ecologist

		<ul style="list-style-type: none"> • Use of block nets and/or temporarily constructed rock barriers will be used at inlets and outlets to isolate lakes for fish removal. • During initial fish removal, gillnets will be checked frequently. Later gillnets could be overwintered. • Use of piscicides, including transportation, storage and handling, will follow current guidelines and safety precautions as described on the Material Safety Data Sheet and labeling. • To verify conditions in lakes prior to treatment with piscicides, water quality data, including Secchi disk depth transparency, water temperature, dissolved oxygen and pH depth profiles will be collected. Analysis will also be made of nutrient and chlorophyll-A samples, zooplankton samples, and littoral benthic macroinvertebrate samples. There will also be visual surveys for amphibians during the mechanical fish removal phase. • Where large numbers of fish are present, monitoring of lake water quality measures, such as dissolved oxygen, will occur and, if monitoring indicators warrant it, non-lake nonnative fish disposal methods will be used. • Analysis of fish size and/or biomass will be used to predict the potential water quality impacts from decomposition during fish removal from gillnetting. If impacts are determined to be unacceptable (e.g. from a large number or size of fish in a small lake), fish will be disposed of in terrestrial areas, rather than returned to lakes. • Fish weirs will be installed with the least possible streambed disturbance. Once brook trout spawning run timing is better understood, annual placement duration could also be reduced. • Field crews will continue to use boats, banks and gravel bars to the extent possible to avoid stream and lakebed disturbance, thereby minimizing water quality impacts. • Care will be taken to locate the proposed weir in a stable area, where minimal disturbance will be needed for placement. It will be removed seasonally, with up to three months of use each year and for up to five seasons. • Effectiveness of the weir will be evaluated annually and the project will be discontinued if determined to be ineffective.
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		<ul style="list-style-type: none"> • Upon successful reduction of brook trout, extension of weir operations to future years could be considered if results indicate this is necessary. Upon removal of the weir, area conditions will be restored, leaving no lasting impact. 	
9Fish and Wildlife	<p>With removal of nonnative fish from 10 lakes and their outlets and Tolmie and Ipsut creeks, there will be fewer adverse effects combined with long-term beneficial effects on other fish and wildlife in these areas.</p> <p>A comprehensive fish management program involving the use of chemical piscicides, electrofishing and gillnetting may adversely affect some fish and wildlife; however these short-term and/or limited adverse effects will be small compared to other important park values and conservation efforts, such as restoring native fish and amphibian populations.</p>	<ul style="list-style-type: none"> • In piscicide treatment areas with obvious presence of native amphibians, as many larval, juvenile and adult individuals as possible will be captured and temporarily moved to a nearby holding area while treatments are conducted. Afterwards, they will be returned. • Where possible, conduct piscicide treatments outside the larval season for amphibians. • Decontamination procedures (following Samora et al. 2011) will be used when monitoring, gillnetting, or piscicide treatments have been conducted (after each use in each lake or stream). • Gillnets will be monitored to the extent practical to keep wildlife from becoming caught in the nets. • Weir traps will be checked daily while in operation to minimize holding time for native fish or other wildlife incidentally captured at the weir. • Citizen science angling and electrofishing will have a very low tolerance for hooking or electrofishing mortality of native fish: One native fish per site per year. If this threshold is met the site will not be revisited until the following season. • Trained and certified technicians will operate electrofishers and seine nets to minimize potential harm from inexperience. • Limited electrofishing in bull trout habitat will only occur between July 15 and August 15, to avoid impacts to developing eggs and alevins, and will occur no more than once per year at each location. • Very conservative thresholds of one native fish mortality per site per year will be set to minimize impacts of fish removal efforts. • Minimize total mortality from nonnative fish removal activities in bull trout habitat by counting likely delayed mortalities towards the limit of one bull trout mortality per year for each activity at each site. 	Project Manager Aquatic Ecologist

		<ul style="list-style-type: none"> Minimize disruption to bull trout migration up- and downstream at fish weirs by checking traps and providing passage for bull trout twice daily. Replace the lowest culvert on the White River Campground last. 	
Special Status Species	<p>Because there will be no habitat loss and noise and disturbance effects will be avoided during the nesting season by implementation of mitigation measures, actions under the selected alternative may affect, but will be not likely to adversely affect northern spotted owls and marbled murrelets.</p> <p>Because fish management actions to remove nonnative fish will be conducted in areas and during times when most listed fish species were not present, and because fishing regulations will require catch and release of native and retention of nonnative fish, proposed actions may affect, but not likely to adversely affect steelhead, and Chinook salmon. There will be no loss of habitat for these species and they will also benefit from the removal of nonnative fish through reduced competition and potential for hybridization.</p> <p>While most of the above actions will also be unlikely to adversely affect and/or will benefit bull and coastal cutthroat trout, and coho salmon, use of a weir to capture brook trout from tributaries in the Carbon River could inadvertently result in capture and handling of bull trout and coho salmon since they both also occur in Carbon tributaries. Similarly, electrofishing in bull trout habitat will result in stunning and capture of bull trout as well as coho salmon. Seining could result in</p>	<ul style="list-style-type: none"> The following measures will be used to reduce impacts on special status species: <ul style="list-style-type: none"> Weirs will be monitored while in use, and brook trout and westslope cutthroat trout will be captured, while bull trout and other native species will be released. Catch and release fishing regulations will be implemented for all native fish. Fishing brochures and apps will be provided to help anglers identify nonnative vs. native fish. No limits, no season fishing with retention of nonnative fish will be implemented for all lakes in the park. There will be a focus on mechanical methods for removal of nonnative fish in the Selected Alternative, and use of piscicides in the Selected Alternative will be limited to those areas where bull trout do not occur. Limited electrofishing in bull trout habitat will only occur between July 15 and August 15, to avoid impacts to developing eggs and alevins, and, will occur no more than once per year at each location. Analysis of stream invertebrates will be made before piscicide treatments to ensure that species were widely distributed and able to recolonize the area following potential impacts related to piscicide use (after Buktenica et al. 2013). Analysis of amphibians will occur before piscicide treatments to ensure that none were in the gill breathing stage during treatment timing. 	Aquatic Ecologist Project Manager

	capture of native fish (bull trout, coastal cutthroat trout, rainbow trout/steelhead, and coho salmon) while removing brook trout. Elsewhere electrofishing will also occur in coastal cutthroat habitat. Therefore actions may affect, and likely adversely affect bull trout. Coastal cutthroat trout and coho salmon (special status species) may also be negatively affected.	
Visitor Experience	With fish removal using both mechanical and chemical means, long-term beneficial effects will likely eventually predominate with most visitors taking pleasure in the fact that park ecosystems were preserved; however, there will be a range of short-term adverse effects on visitor perceptions of fish and fishing in the park, especially if a favorite fishing area was the target of fish removal. Eventually, visitors will be displaced to other areas of the park where fishing opportunities will remain abundant and beyond the scope of the current demand.	<p>Chief Ranger Aquatic Ecologist Project Manager</p> <ul style="list-style-type: none"> The public will be notified of area restrictions, including piscicide use, through signs located at trailheads, at ranger stations, and via the wilderness permit system and through other public notification processes, such as on the park website.
Human Health and Safety	<p>Fish in the park have been documented (NPS, USGS) to contain mercury; however levels are below significance thresholds. Although the park considered placing an advisory in the fishing regulations, upon discussion and analysis by the Washington State Department of Health (WDH), the minimal levels were found to not warrant one.</p> <p>Small risks for visitors will be associated with encountering a lake undergoing treatment to remove nonnative fish with electrofishing, gillnetting or piscicide use. Therefore</p>	<p>Project Manager</p> <ul style="list-style-type: none"> As required by law, piscicide and neutralizer (potassium permanganate) product labels and MSDS/SDS (Material Safety Data Sheet) will be followed. To ensure adequate protection, all personnel handling piscicides will be required to wear personal protective equipment (PPE) as required by the EPA and listed on the product label. Treatment areas will be clearly marked and identified with posted signs. Public access to project areas will be prohibited during and following treatment. Fish killed by piscicides will not be consumed and treated waters will not be ingested. As required by NPS guidelines, on- and offsite safety meetings will be held prior to application of piscicides and

	<p>areas will be posted no swimming. Piscicides are broken down by light, dissolution, bacteria, and typical water treatment methods.</p> <p>There will be little risk to the public from the use of piscicides. There will be no or limited effects downstream where people might gather water. There will be no effects outside the park boundary because treatment will occur far upstream and/or be neutralized within the park.</p> <p>Precautions will also be followed to ensure that consumption of treated fish did not occur, and as discussed in the fish and wildlife section, there will also be little risk to wildlife from consumption. Even if consumption of treated fish occurred, toxicity is below the level of concern (EPA 2007).</p>	<p>implementation of the actions associated with the alternatives. This meeting will include review of the piscicide and neutralizer product labels and material safety data sheets (MSDS); need for and use of required PPE; and information about exposure control, safe mixing and application of the products, health effects, and first aid measures. In addition environmental considerations including driving conditions, helicopter safety (if applicable), water safety, weather conditions (related to the potential for dehydration, sun exposure), safe use of application equipment, radio communication, and situational awareness will be included.</p> <ul style="list-style-type: none"> • Piscicides and neutralizers will be stored according to label and MSDS instructions in the original containers until applied to the treatment area. • Transport will include storage inside of a locked lined box, and use on site will include placement inside a contained area, not close to waterbody shorelines. • There will continue to be periodic monitoring of mercury levels in fish, and consultation with the WDH regarding findings and recommendations regarding fish consumption advisories, if any, will be followed. • Existing safety precautions will continue to be used in research related to fish control, and in inventory and monitoring activities. • Only trained and certified applicators will apply piscicides and will use recommended personal protective equipment. 	
Wilderness	<p>Although some wilderness qualities will be affected, effects will be short-term and counterbalanced by the high resource benefits of implementing them on improving the park's native aquatic ecosystems.</p>	<ul style="list-style-type: none"> • Minimize effects on wilderness values by avoiding actions in July and August when visitor use numbers are highest, such as on weekends and holidays. • Treat a small number of lakes at one time. • Minimize number of helicopter flights. • Begin and end helicopter overflights from high elevation (nonwilderness) helispots or helispots outside of habitat areas, outside the marbled murrelet and northern spotted owl nesting season, and avoid flight paths over nesting habitat. 	<p>Chief Ranger Wilderness Coordinator Aquatic Ecologist Project Manager</p>

ATTACHMENT B

Comments and Responses Mount Rainier National Park Fish Management Plan Environmental Assessment

The following concern statements and responses were developed from public comments received in response to the Fish Management Plan Environmental Assessment.

1) Nonnative fish should be removed from each one of the 35 water bodies with reproducing populations.

Response: This alternative was considered but dismissed because of the complexity and untried methodology for removing nonnative fish from some of the largest and deepest waterbodies and because it will have more impacts than other alternatives considered.

Language on page 28 notes:

This action was discussed and considered internally, but dismissed for several reasons. Among these include the need to start small and scale up fish removal operations based on budget, resources, and timing. Since only small areas have been treated as study sites so far, there is uncertainty about the success of treatment in larger, more complex areas.

2) Reintroducing adult spawning salmon and steelhead to Ranger Creek should be a high priority.

Response: Investigating the feasibility of salmon and steelhead reintroduction is a high priority for the park; however, reducing or eliminating nonnative fish first... will increase the probability of successful reintroduction. In addition, guidance on salmon and steelhead reintroduction is to allow natural recolonization first, if possible, because it poses the lowest risk approach, thereby minimizing the interruption of natural biological processes (Anderson et al, 2014).¹ A targeted planning effort is required to pursue this action.

3) Provide additional background information on park amphibian populations to assess effectiveness of proposed fish removal from 35 lakes with reproducing fish populations.

Response: One of the goals in the EA is to “reduce the impact of nonnative fish so they do not create unacceptable impacts to native fish and other wildlife, including amphibians.” The selected lakes represent a range of elevations, depths, and habitats, all with known amphibian species based on past inventory data (Samora et al. 2013).² Because fish removal in all lakes is important to meet this goal, additional background information on amphibian populations in the park will neither provide support for proposed fish removal actions, nor change priorities.

¹ Joseph H. Anderson, George R. Pess, Richard W. Carmichael, Michael J. Ford, Thomas D. Cooney, Casey M. Baldwin & Michelle M. McClure (2014) Planning Pacific Salmon and Steelhead Reintroductions Aimed at Long-Term Viability and Recovery, North American Journal of Fisheries Management, 34:1, 72-93, DOI: 10.1080/02755947.2013.847875

² Samora, B., M. Layes, and R. Lofgren. 2013. Mount Rainier National Park amphibian inventory 2001-2003. Natural Resource Technical Report NPS/NCCN/NRTR—2013/696.S. National Park Service, Fort Collins, Colorado.

4) Identify the portion of park deep water habitats that are fishless and suitable for amphibians. Correct the Ryans (2014) reference on page 43.

Response: The comment is correct that this is not a correct citation. The passage has been modified in the Errata to state:

Approximately 70 percent of lake areas in the park known to be over 6.5 feet deep contain nonnative fish (park unpublished data). This currently leaves approximately one-third of the deepwater habitats typically inhabited by *A. gracile* (northwestern salamander) and *R. cascadae* (cascades frog) without fish (Larson 2016).³ Climate change threatens to eliminate many ephemeral habitats and shorten wetland hydroperiods (Ryan 2014) further reducing suitable habitat available to native amphibians.

5) The park should use citizen science-directed fishing to remove nonnative fish in targeted lakes before using other methods.

Response: The plan calls for a coordinated effort of citizen science-directed fishing in the Carbon River and also seeks to increase angler harvest of nonnative species in lakes by reverting to no limits for nonnative species. It also encourages anglers to assist with nonnative species suppression through education and outreach. Relying only on fishing to remove high density, reproducing fish populations in lakes, however, is not effective. Proposed guided citizen science programming is focused on streams where nonnative species overlap with threatened species to increase opportunities for protection of the threatened species and for monitoring.

6) List the locations of the 23 lakes where treatment of nonnative fish to improve climate change resilience for sensitive amphibians would occur.

Response: The revision to Appendix 2 shows the locations of the 23 lakes. For several reasons, it is likely that removal of fish from all lakes will improve climate change resilience. Among these include removal of one of the major stressors from lakes, namely fish impacts on amphibians and other aquatic biota.

Note: In the above reference, 23 should actually be 20 and this has been noted in the Errata.

7) State whether nine of the original 44 stocked lakes are fishless.

Response: Nine of the original 44 stocked lakes are fishless. All remaining lakes, except for the Littorals Pond (White River Watershed) and Tipsoo Lake (Ohanapecosh Watershed) are in wilderness. Therefore 33 of 35 lakes with reproducing populations of fish are in designated wilderness.

As noted in the Errata, Mowich Lake is located in wilderness and should not be part of the non-wilderness statement on page 4.

³ Larson, G.L., R.L. Hoffman, R. Lofgren, B. Samora, S. Anderson. 2016. Increased amphibian presence in a montane lake after fish removal. Unpublished report Mount Rainier National Park, Washington.

8) Illustrate the location, size, depth and connectivity of lakes targeted for nonnative fish removal. Without this information, it is difficult to discern whether there are source populations of nonnative fish that could result in recolonization of the lakes by nonnative fish.

Response: Park priorities focus on removal of brook trout populations in lakes, beginning with less complex habitat, where there is a greater chance of successful removal. Remaining lakes were prioritized based on the criteria identified in the plan. We have included a supplemental table (see Errata) showing the lakes with reproducing fish populations and their coordinates.

9) Provide more information about non-target effects of rotenone, particularly on zooplankton abundance.

Response: Vinson et al. (2010) found that aquatic invertebrate assemblages are highly diverse and dynamic even after rotenone use. Other recent work suggests that impacts to invertebrate assemblages can be reduced with lower concentrations than have generally been used in the past (Finlayson et al. 2010). Because manual treatments will be used first, chemical treatment will be case-by-case with appropriate concentrations to reduce impacts to non-target species. Additional information about the Vinson et al. (2010) review of 22 field studies is available in NPS, NOCA 2013.⁴

10) More consideration should be given to priorities for removing nonnative fish to avoid impacts on aquatic invertebrates (not just amphibians), especially because of the importance of aquatic invertebrates as food for alpine nesting birds and other species.

Response: While the plan does emphasize amphibian recovery, primarily due to the prevalence of studies conducted by the park to monitor amphibian response to fish removal in the park, there are multiple references to the impacts of fish on zooplankton (p. 42, 43, 46) and macroinvertebrates (p. 41, 42). The plan's purpose and need also refers to the impacts of nonnative fish on "aquatic communities."

11) The plan should emphasize the importance of nonnative fish removal to benefit invertebrates and discuss the potential recovery of zooplankton given the long-residence times of nonnative fish. Slow recovery of zooplankton may be a long-term concern upon fish removal from lakes, depending on the length of time fish have been present. Delayed recovery of zooplankton could affect the recovery of other species, such as salamanders, that are dependent on them for food.

Response: Based on the removal of fish from a small number of lakes in the park, amphibian populations have increased when fish are removed. Depending on the fish removal method variable recovery of invertebrates and zooplankton will occur. These impacts are likely less than will result from the continued presence of nonnative fish on native aquatic communities, including zooplankton.

⁴ NPS, NOCA. 2013. An Assessment of the Environmental and Human Health Risks of Using Rotenone to Implement the Mountain Lakes Fisheries Management Plan in North Cascades National Park Complex. U.S. Department of the Interior, National Park Service, North Cascades National Park Service Complex, Sedro-Woolley, Washington.

12) The plan should discuss how the public will be educated regarding the potential for trout hybrids to occur and to be targeted.

Response: It is difficult to correctly identify bull trout/nonnative brook trout hybrids. The park relies on genetic testing to confirm the presence or absence of hybrids and will not depend on the public to identify hybrids. The park will continue to pursue genetic testing to monitor the potential presence of hybrid bull trout/brook trout in the park.

13) Although the alternatives address outreach and education, they do not go far enough to address public concerns regarding piscicide use and potential contamination from fish consumption. A multipronged approach to enhanced visitor education (e.g. website, brochures, programs, outreach, park newspaper, interagency efforts, etc.) should be a component of implementing the Fish Management Plan.

Response: As noted by the comments and the proposed actions in both alternatives 2 and 3, multiple means to address the public outreach component of the plan will be used. Depending on the desired outcome, the method of public outreach will change. At a minimum, there will likely be an application (app), updated website, and a fishing pamphlet, as well as interpretive roving directed at anglers.

14) More explanation is needed regarding why all of the lakes with reproducing fish populations are not being targeted for fish removal. Priorities for fish removal should be based on the best chance of successful eradication and which also achieve the goal of restoring amphibian populations.

Response: The plan states: "Omit or reduce priority sites with habitat determined to be more complex leading to a lower probability of successful eradication via mechanical or chemical treatments. For connected lakes and streams, this will be those that have 2 or more connected lakes, or are more than 25 acres, more than 25m deep, and/or longer than 400 m. (There are 19 sites where there is a lower probability of eradication based on these criteria.)" (page 23). The 19 sites start at lake priority 17 down.

15) Consider phasing removal of fish based on remoteness and use by anglers, with the goal of nonnative fish removal from all sites over time.

Response: Phased removal of fish based on the likelihood of angling was considered but was dismissed in favor of changing fishing regulations to allow for no catch limits in lakes where nonnative species are present. Remote lakes, with little connectivity, on the other hand, represent some of the best chances for nonnative fish eradication and most are little used by anglers.

16) eDNA should be used in monitoring to detect threatened or endangered species.

Response: The park is currently using eDNA to determine the presence/absence of bull trout in various tributary locations. To the extent that funding is available, eDNA will also be used for other species.

17) Additional data should be used to support the actions identified in the alternatives.

Response: Fish distribution, size and species, as well as lake hydrography were all considered in the decision-making process about which species and areas to target initially for fish removal. Publications and other unpublished references used are cited throughout the document. Additional data on genetic diversity, amphibians and invertebrates will be helpful, but will not change the need to remove reproducing nonnative fish populations from park waterbodies.

18) Selection of methodology for fish removal should be based on the individual characteristics of each lake and the potential success of the methodology.

Response: As noted in the responses to other questions about how priorities were determined, a range of criteria was used to analyze the feasibility of success for each water body with reproducing fish populations. Selected sites were identified based on the greatest potential for success owing to low habitat complexity. Criteria include the known fish barriers present below treatment areas, which will prevent recolonization, outside of illegal human restocking.

19) Reliance on manual methods for the first five years is unnecessarily confining and will continue fish presence resulting in ecosystem effects worse than treatment with piscicides.

Response: Under the plan's intent to do no harm, using manual methods (the least invasive method) first allows the opportunity to reduce impacts without using more impactful means. Flexibility in the language allows for other methods to be used if mechanical treatment is or proves infeasible in less than five years. For example, see page 21, "In addition to gillnets and electrofishing, the park will employ limited use of chemical piscicides in high elevation lakes and the White River Ponds if mechanical removal proves ineffective in eliminating nonnative fish (after five years of monitoring) or where mechanical treatment is infeasible." The up to five years' time-frame was given as an estimate for successful removal where mechanical means are working.

20) The costs, physical and environmental, of each fish removal method should be considered in the decision-making process.

Response: Implementation of fish removal in lakes will begin with the least impactful action. Mechanical methods will be used up to 5 years, but as stated above there is flexibility in the language. The park considered likelihood of success, logistics (including cost), into account when determining a maximum effort of 5 years of mechanical treatment.

21) The selection of fish removal sites should be based on data about waterbody distribution across the landscape. The EA should also discuss the ability of lakes to recover given dispersal abilities for micro and macroinvertebrates and amphibians.

Response: As noted in the response to comment #8, prioritization was focused on the removal of brook trout and the likelihood of fish removal success based on habitat complexity. Although additional landscape perspective could benefit the plan, proportionally there is a relatively small number of lakes in the park with reproducing fish populations (approximately 35 of over 380 lakes and ponds). Very little additional data is available on potential source populations for

aquatic organisms. Therefore, the plan focuses on the feasible accomplishment of brook trout removal from high priority water bodies, meeting the purpose and need.

22) Additional information about the frequency of monitoring of fishless lakes should be included in the EA. What actions will be taken if future illegal stocking occurs?

Response: The status of the nine fishless lakes is monitored periodically by park staff through gillnetting and angling. Illegal stocking of new populations of fish is evaluated on a site by site basis. The park will seek to maintain 10 lakes identified in alternative 2 fishless.

23) Perceived conflicts between impacts on wilderness and endangered species can be resolved through changing timing of activities, such as by caching materials or work in late summer.

Response: As noted in the plan, avoiding treatment during July and August peak use times (weekends and holidays) balances impacts to wilderness character and provides ample time during mid-week and outside of August and July to complete work. Based on wilderness use data, mid-week is generally fairly quiet, making activity conducted then less likely to impact wilderness visitors. In addition, conducting fish removal efforts in fall (Sept-Oct) minimizes impacts to native amphibians and aquatic invertebrates by allowing the juveniles to metamorphose and leave the site before treatment/disturbance. As the commenter suggested, it is also possible to cache equipment and supplies for earlier or later use, but this operational detail will be considered on a case-by-case basis, through the minimum requirement or Section 7 process, to further limit impacts in some areas to rare species or wilderness visitors. Given the ability to hike into most sites and the portability of anticipated equipment, caching equipment may not be needed.

24) Additional discussion of the unintended consequences of fish removal methods should be included.

Response: NPS staff will follow terms and conditions outlined in the U.S. Fish and Wildlife Service's Biological Opinion on the MORA Fish Management Plan intended to reduce impacts to threatened and endangered species, and designated fish habitat.

25) Use of fish removal methods may have unintended consequences on park resources and human health and safety. NPS should ensure that such use will not affect visitor health.

Response: The park has included a range of mitigation measures, depending on the methodology used to remove nonnative fish. These mitigation measures are state-of-the-art means to avoid any detectable impacts on human health. As implementation progresses, additional measures may be added, as they are developed.

26) Clarify whether eight or nine culverts are currently known to block fish passage in the park and identify the disposition of human caused barriers in the alternatives.

Response: The proposed number of culverts currently known to block fish passage is still "approximately nine." Eight of these are listed. The survey for culverts in need of replacement is ongoing as are actions to address these. Ongoing removal of culverts is a current project that will continue in the absence of the Fish Management Plan (see the description of the no action

alternatives on page 16). Additional surveys are planned, particularly in the Ohanapecosh area, to determine whether there are other culverts in need of replacement. The ongoing project will continue until no additional culverts that block fish passage have been identified and all culverts have been inventoried.

27) Providing minimum streamflow requirements for fish is important and should be discussed in the context of water withdrawal for park operations from Klickitat, No Name, and Laughingwater creeks.

Response: All park water supply intakes are located above natural fish barriers. Fish presence up and downstream varies. No fish are present in No Name stream, the current water supply for Ohanapecosh. Although the Laughingwater Creek intake infrastructure (former Ohanapecosh water supply) is still in place, it is not in use. Reuse will trigger analysis of impacts on coastal cutthroat and cutthroat hybrids. Nonnative Yellowstone cutthroat are present above the Laughingwater Creek intake and rainbow trout hybrids are present upstream of the Nickel Creek intake. Impacts to spawning bull trout in Klickitat as a result of the water intake upstream are unknown but the stream currently maintains adequate water supply year-round. The Carbon River area intake (formerly in Ipsut Creek) has also been abandoned. The water intake on Crystal Creek is maintained as an historic structure, but is currently not operational. Changes to water intakes are outside the scope of the Fish Management Plan. Nonetheless, the park is currently working on a proposal with USGS to look at the vulnerability of these water supplies in the future and their potential impacts on aquatic species. In addition, the Wilderness Management Plan will evaluate the presence of water systems located in wilderness.

28) What visitor use data were used to analyze angling in wilderness?

Response: Results from the 2012 Mount Rainier National Park Visitor Study indicate 1% of visitors participate in fishing in the park (Manni et al. 2013).⁵ Based on recreational visits from 2016, 1% of recreational users equates to approximately 13,000 anglers. Additional work this past summer (Chiapella and Strecker 2016) confirms the relative accuracy of this estimate.⁶

29) Population data for native species, including threatened and endangered species should inform priorities for nonnative species removal and native fish relocation efforts.

Response: One of the criteria for determining fish removal actions is “effects on rare, threatened species,” specifically to reduce or eradicate brook trout in bull trout critical habitat, beginning with headwaters’ source populations. Threatened bull trout population data was key in prioritizing fish removal actions.

30) Tribal cooperation and concerns, including research regarding hybridization, is not evident in the EA.

⁵ Manni, M. F., Y. Le, and S. J. Hollenhorst. 2013. Mount Rainier National Park visitor study: Summer 2012. Natural Resource Report NPS/NRSS/EQD/NRR—2013/376. National Park Service, Fort Collins, Colorado.

⁶ Chiapella, A. and A. Strecker. 2016. National Parks Visitor Survey: Ecological knowledge and fisheries management opinions Mount Rainier (MORA) and North Cascades (NOCA) National Parks, July – August 2016. Unpublished draft report on file, Mount Rainier National Park, Ashford, Washington.

Response: During development of the Fish Management Plan the park has sought both informal and formal (during government to government consultation) input from the following tribes: Cowlitz, Muckleshoot, Nisqually, Puyallup, Squaxin Island, and Yakama. The park will continue to partner with tribes to support fish management and research in Mount Rainier National Park.

31) Mercury contamination may be higher and therefore a bigger risk to human health than is identified in the EA.

Response: Upon further examination, the commenter's data analysis was faulty and human exposure to contaminants in park fish does not exceed the EPA threshold. Although individual fish may occasionally exceed the threshold, the park has worked with the Washington Department of Health, who did not recommend a fish advisory based on that data. Nonetheless, the fish pamphlet will highlight the potential for mercury contamination in park fish, with language approved in consultation with both the regional air quality specialist and the WDH. For example:

Past studies have found elevated levels of mercury in individual fish sampled from select lakes in Mount Rainier National Park that exceeded health thresholds for potential impacts to fish, birds, and humans. However, the majority of fish sampled in the park had concentrations below established human health thresholds. Based on mercury concentration results, the Washington State Department of Health did not recommend a fish consumption advisory for Mount Rainier National Park. The possibility of catching highly contaminated fish in the park is likely low, but each person should make their own decision about eating fish that were caught in Mount Rainier.

Additional information on mercury in the National Parks and effects on human health can be found at <https://www.nature.nps.gov/air/studies/ToxicEffects.cfm>. For more information about statewide fish advisories and healthy fish choices visit the Washington State Department of Health www.doh.wa.gov/fish.

32) Analysis on page 35 should be modified to show the adverse effects from a pulse of nutrients associated with fish decomposition. Additional baseline data regarding O2 profiles may be needed before identification of disposal methods.

Response: Language on page 35 has been modified as follows: "would be more likely to" was changed to "could," and another sentence "A range of adverse effects could also result from the influx of nutrients in an otherwise nutrient poor environment." was inserted.

Monitoring the results of fish removal efforts includes monitoring water chemistry and macroinvertebrates. Zooplankton monitoring is included in the action alternatives (2 and 3) under "Expanded Research and Monitoring." Generally, fish would be returned to the waterbody they were removed from. For example, at the weir and during seining/electrofishing carcasses would be placed along stream channel margins.

33) The plan should state whether additional NEPA documentation would be required to analyze regulation changes.

Response: As noted on page14: "In addition, proposed changes to park fishing regulations will require publication of these in the Federal Register, along with an additional subsequent (separate) public comment process." As a result, the park is pursuing a rule change to 36 CFR 7.5 in the Federal Register for fishing regulations applicable to Mount Rainier National Park. This process is expected to take some time. Olympic National Park currently uses the Superintendent's Compendium to make annual changes to fishing regulations. Currently, Mount Rainier's Superintendent's Compendium includes fishing regulations also not included in the CFR.

The park is working with the NPS Washington Office's regulations office on the rule change process. Regardless, there will be another public comment process to finalize updated fishing regulation in the Federal Register. In the interim, it is likely that the park will also use the Superintendent's Compendium, since the rule change process may take some time to effect.

