National Park Service
U.S. Department of the Interior

Glacier National Park
Montana

FINDING OF NO SIGNIFICANT IMPACT

WESTSLOPE CUTTHROAT TROUT AND BULL TROUT PRESERVATION IN THE UPPER CAMAS DRAINAGE

Recommended:

MAY 15 2019

Jeff Mow — Date
Superintendent, Glacier National Park

Approved:

June 10, 2019

Kate Hammond — Date
Acting Regional Director, Intermountain Region, National Park Service

INTRODUCTION

In compliance with the National Environmental Policy Act (NEPA), the National Park Service (NPS) prepared an Environmental Assessment (EA) to examine alternative actions and environmental impacts associated with the proposed project to preserve westslope cutthroat trout and bull trout in the upper Camas drainage of Glacier National Park. The project is needed to protect native westslope cutthroat trout against hybridization with non-native Yellowstone cutthroat trout, and to protect westslope cutthroat trout and bull trout against habitat degradation occurring as a result of a changing climate.

The statements and conclusions reached in this finding of no significant impact (FONSI) are based on documentation and analysis provided in the EA and associated decision file. To the extent necessary, relevant sections of the EA are incorporated by reference below.

SELECTED ALTERNATIVE AND RATIONALE FOR THE DECISION

Based on the analysis presented in the EA, the National Park Service selected Alternative A – remove Yellowstone cutthroat trout from Camas Lake, Lake Evangeline, and Camas Creek upstream of Arrow Lake, followed by the translocation of westslope cutthroat trout and bull trout to Camas Lake and Lake Evangeline (the NPS preferred alternative, pages 3-9 in the EA).

The selected alternative will 1) remove non-native Yellowstone cutthroat trout from Camas Lake, Lake Evangeline, and Camas Creek upstream of Arrow Lake, and 2) translocate westslope cutthroat trout and bull trout to Camas Lake and Lake Evangeline.

Remove Yellowstone Cutthroat Trout

Non-native Yellowstone cutthroat trout will be removed by means of rotenone (CFT Legumine). A 5-percent formulated product will be applied to achieve a concentration of 1 ppm (parts per million). This will result in an active ingredient (rotenone) concentration of 0.05 milligram per liter in the water (1 ppm is equivalent to 1 milligram per liter). It is currently estimated that a total of approximately 1450 to 1500 gallons of rotenone will be required to achieve a 1 ppm concentration; this amount is approximate and could change as final calculations are made.

Rotenone will be applied to the lakes from motorized watercraft (by means of tubing extending into the water from a container in the boat), such as a zodiac with an outboard motor or small motorboat, and to the stream from drip stations and backpack sprayers. Two motorized boats will be used, one on each lake, and could be in operation simultaneously. At least five drip stations are anticipated, with stations at the inlet and outlet of Lake Evangeline, two stations between Lake Evangeline and Camas Lake, and a station at the outlet of Camas Lake (Figure 1). Additional drip stations may be necessary at small inlets; the total number of drip stations is not expected to exceed eight at the most. Backpack sprayers will be used to apply rotenone to the braided channels on the north end of Camas Lake. Water pumps will be used to help distribute the rotenone as needed. Slow-release rotenone mixtures consisting of rotenone and an inert substance (such as sand and unflavored gelatin) will also be used in areas of upwelling to prevent target fish from avoiding exposure in these areas. The rotenone will be released as the mixture breaks down in the water; the mixture will be contained (in a burlap bag, for example) and removed at the end of the treatment. Removing fish via electrofishing and possibly other mechanical methods (such as netting, angling, and/or possibly traps) will also be used as needed.

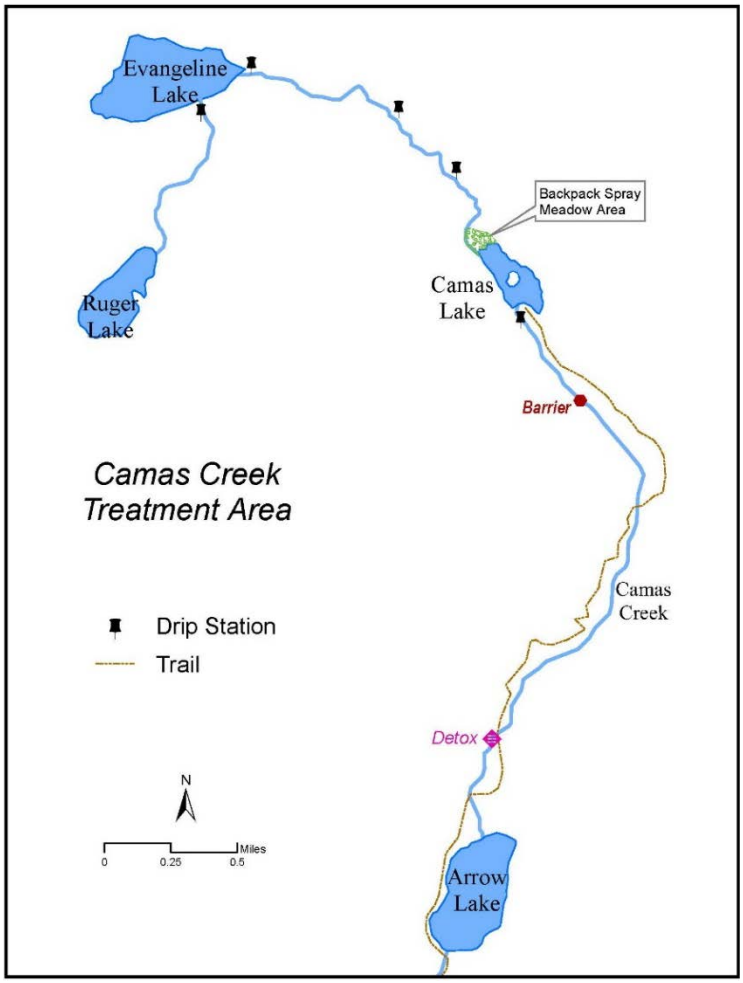

Figure 1: Map of treatment area illustrating approximate locations of rotenone drip stations, backpack spray area, and detox station (courtesy MFWP).

The project will begin in late August or early September of 2019. Only one application of rotenone is usually needed for successful treatment. Given the extreme toxicity of rotenone to fish, it is expected that the majority (if not all) of the Yellowstone cutthroat trout will be removed. Some individual fish may survive, however, such as in areas of groundwater inflow where the rotenone is unable to reach them. Post-treatment sampling (with nets, electrofishing, angling, and/or sampling DNA from the aquatic environment, for example) will be done to assess the effectiveness of the treatment. If Yellowstone cutthroat trout are present during post-treatment sampling, a second application may be employed during the same or a following year to remove the remaining fish. Also, translocating (i.e. stocking) genetically pure westslope cutthroat trout on top of any remaining Yellowstone cutthroat trout will result in genetic swamping, which will reduce the reproductive potential of any remaining Yellowstone cutthroat trout.

Prior to the application of rotenone, flourescein, a non-toxic dye, will be applied to the stream and tracked to confirm the flow rate. Flourescein dye is routinely used to study surface and groundwater flow patterns, and is inert and non-toxic. The amount of dye used will be in accordance with accepted industry standards, product labeling, and protocols, and is estimated to be less than a gallon.

Following application of the rotenone, a potassium permanganate solution will be used to detoxify the stream and neutralize the rotenone before it reaches native fish populations in Arrow Lake. The

potassium permanganate will only be applied to Camas Creek. Camas Lake and Lake Evangeline will not be treated with potassium permanganate, but will be left to detoxify naturally. The potassium permanganate solution will be applied to the stream from a detox station upstream of Arrow Lake (Figure 1) by means of an auger dispenser powered by a generator. The generator will operate continuously (24 hours a day, 7 days a week) until the rotenone is detoxified. The anticipated concentration will be a ratio of 3:1 potassium permanganate to rotenone. An estimate of approximately 1112.6 pounds of potassium permanganate will be dispensed (2-4 milligrams per liter).

During detoxification, live cutthroat trout (i.e. sentinel fish) will be caged at the downstream end of the detox area and monitored to determine if the rotenone treatment is effective and when the stream has detoxified to the point where it is safe for native fish. The application of potassium permanganate to the stream will continue until the sentinel fish survive for four hours without any sign of stress, in accordance with aquatic life standards set forth in the American Fisheries Society Rotenone Standard Operating Procedures Manual (Finlayson et al. 2010). Detoxification with potassium permanganate is estimated to take place for approximately two to three weeks. Afterwards, while safe for fish, the stream could contain some residual levels of rotenone, which will be left to neutralize naturally. Rotenone has a half-life (the time it takes for a substance to break-down by 50 percent) in water of a few days to a few weeks, depending on the type of habitat (stream or lake), amount of sunlight, water temperature and turbulence (EPA 2007). Since treatments will be at the minimum concentration necessary (1 ppm), levels will be expected to drop below those that are toxic to aquatic life within two to three weeks (i.e. the first half-life will reduce concentrations to 0.5 ppm, well below the lethal level for fish). Water chemistry at Camas Lake, Lake Evangeline, and Camas Creek is expected to be fully restored to pre-treatment levels over the winter, before the following spring.

During rotenone applications, many of the dead fish typically remain submerged. Any dead fish that come to the surface will be collected and either sunk in the lakes or removed from the site to avoid attracting bears and other wildlife. While Camas Lake and Lake Evangeline are 100 percent Yellowstone cutthroat trout, westslope cutthroat trout and native sculpin may be present in Camas Creek upstream of Arrow Lake, within the rotenone treatment area. Bull trout have not been found in the treatment area. The stream above Arrow Lake will be electrofished prior to the application of rotenone and any bull trout found will be released downstream of the treatment area where they will not be affected. There is a dry reach of Camas Creek occurring in late summer downstream of the treatment area but upstream of Arrow Lake, which will prevent bull trout from re-entering the treatment area. Other fish species captured upstream of Arrow Lake will be used as sentinel fish.

Certified Piscicide Applicators and trained staff will oversee the application of the rotenone and other chemicals, as required by NPS policy (2006 Management Policies, Section 4.4.5.3), the Montana Department of Agriculture, and Montana Fish, Wildlife, and Parks (MFWP). Approximately 15 project personnel will be on site. Personnel will likely camp at the backcountry campgrounds at Camas and/or Arrow Lakes, and may also camp at Lake Evangeline, for the duration of the rotenone application and detoxification period, anticipated to last approximately three to four weeks (an estimated two to three days for rotenone application and two to three weeks for detoxification).

Pre-treatment biological surveys and monitoring for macroinvertebrates, plankton, and amphibians have already taken place in order to help assess baseline community conditions and allow post-project monitoring to evaluate organism response and recover rates. Established monitoring protocols in Montana's Piscicide Policy will be followed, which draw from the American Fisheries Society Rotenone Standard Operating Procedures Manual and the Montana Department of Environmental Quality and Environmental Protection Agency's water quality and aquatic invertebrate monitoring protocols. If treatment is not successful, a second application could occur in the same year or during a following year.

Reapplication methods and protocols (e.g. chemical concentrations and application methods, treatment areas, timeframes, etc.) will generally be as just described. If reapplication procedures change, resources management staff at the park will review them prior to implementation; if review determines that impacts from reapplication will exceed those identified in this EA, reapplication will not occur without separate environmental analysis and compliance as appropriate. If reapplication of the rotenone is necessary, some equipment may be temporarily cached onsite (e.g. boat motors will likely be hauled out but the boats without motors and other equipment may be cached).

The treatment area will be temporarily closed to the public during rotenone application and detoxification. The closure will extend from the head of Arrow Lake to Ruger Lake, and include the Camas Creek Trail between Arrow Lake and Camas Lake, as well as the Camas Lake backcountry campground. The closure will be in place from late summer/early fall when the project begins, until the following spring (by which time the rotenone and potassium permanganate will be completely neutralized). The Arrow Lake backcountry campground at the foot of Arrow Lake will also be temporarily closed because it will be occupied by project personnel; the closure of the Arrow Lake backcountry campground will only be in effect during implementation of the project, estimated to last approximately three to four weeks (an estimated two to three days for rotenone application and two to three weeks for detoxification). Arrow Lake and the Camas Creek Trail to the head of Arrow Lake will remain open during this time. The public will be informed of the project prior to implementation by means of media releases and postings on the park's website, backcountry permit office, and visitor centers. Signs informing visitors of the project and temporary area closures will be posted at the Camas Creek and West Lakes trailheads before and during the project.

Translocate Native Westslope Cutthroat Trout and Bull Trout

Following the removal of Yellowstone cutthroat trout from Camas Lake and Lake Evangeline, bull trout and genetically pure (less than one percent non-native genes) westslope cutthroat trout will be translocated into the lakes. This will be done not only to establish secure populations of bull trout and westslope cutthroat trout (since non-native fish cannot access the lakes due to downstream waterfalls that prevent upstream fish migration), but also to genetically swamp any remaining Yellowstone cutthroat trout with genetically pure westslope cutthroat trout, and thus reduce the reproductive potential of any remaining Yellowstone cutthroat trout.

If water temperatures at Camas Lake are not optimal for bull trout (i.e. cold enough for maximum translocation success), bull trout may only be stocked into Lake Evangeline and left to migrate freely into Camas Lake. Translocated fish will come from donor populations within the Camas drainage or other drainages that are similar or near enough on the landscape to have under undergone similar evolutionary pressures. Westslope cutthroat trout donor populations under consideration in addition to the Camas drainage include those from Avalanche Lake (Lake McDonald District), and Ford Creek and Starvation Creek (North Fork District). Bull trout donor populations will be from Trout and Arrow Lakes. Translocated fish will be sourced from these populations because monitoring shows they are demographically strong enough to support the removal (i.e. the populations are large enough to withstand the removal of some fish) (C. Downs, personal communication). It is anticipated that less than 10 percent of a given source population will be removed. Other waters in the park may be considered as donor sources as well, provided they are demographically strong enough (such as Kintla, Bowman, Quartz, and Logging Lakes, for example); separate review and environmental compliance will be done as appropriate.

Individual westslope cutthroat trout and bull trout will be collected from donor populations using methods such as angling, dip netting, trapping, electrofishing, and/or seining. Collected westslope cutthroat trout will be taken to a hatchery outside the park where they will be spawned, and where the

fertilized eggs will be hatched and raised. Collected bull trout will be spawned and released onsite (generally within 24 hours of capture), and the spawned/fertilized bull trout eggs will be taken to a hatchery outside the park where they will also be hatched and raised. The hatchery-raised westslope cutthroat trout and bull trout will remain in the hatchery until they are approximately two years of age, after which they will be transported by helicopter or pack stock to Camas Lake and/or Lake Evangeline. The juvenile fish will be directly released into the lakes from helicopter tanks immediately above the water surface, or released from coolers or other containers from the shoreline. Prior to being loaded with fish, the helicopter tanks and all fish transport containers will be cleaned of all potential pathogens and contaminants, in accordance with state of Montana rules and regulations for live fish transport. Westslope cutthroat trout and bull trout may also be moved directly from source waters to the lakes without hatchery propagation. Or, gametes (eggs and sperm) may be collected from spawning adults, fertilized, and reared naturally in stream-side incubators in the new habitat in Camas Creek (if hatchery propagation is not fully successful, for example), whereby the fish could swim into the lakes from the stream. Incubators are typically a small (approximately 8-inch x 8-inch) plastic basket or bucket or similar container that, if used, will be filled with gravel and eggs. Incubators will not require the use of any motorized equipment. If used, incubators will be in place until the eggs hatch (estimated at approximately two months), and will be checked approximately every two weeks.

Collection of the donor fish will likely begin in 2019. Project personnel (an estimated five to ten member crew is anticipated) will be onsite collecting the donor fish over an approximately one to two-week period. Native fish collection could occur any time during spring, summer, or fall. Personnel will likely camp at either the Arrow Lake or Camas Lake backcountry campground, and may also camp at Lake Evangeline. No area closures will be required during native fish collection, but depending on the size of the crew, some or all campsites at the campground may not be available to the public when personnel are stationed there (since the campgrounds each have a capacity for only eight people). Depending on the success of hatchery propagation and the number of fish that can be translocated to Camas Lake and Lake Evangeline at a given time, collection procedures may need to be repeated each year for an estimated three years.

The translocation, or physical transfer or planting, of the hatchery-reared fish will not begin until the spring of 2020 at the earliest, but may begin later depending on the amount of time needed for the hatchery to raise a sufficient number of mature fish. Native westslope cutthroat trout will be translocated first, followed by bull trout, possibly beginning in the spring of 2021 at the earliest. No area closures will be required during fish planting operations. Personnel (an estimated two to five-member crew is anticipated) may need to stay at one of the campgrounds or camp at Lake Evangeline if planting operations cannot be completed in one day. Translocation will likely take place over multiple years (estimated six to seven) to establish multiple age classes of both species. Translocated fish will be monitored, which could require marking them with tags, fin clips, or other means and tracking them using fixed-location remote stations.

Fish health testing is generally conducted prior to moving fish to a hatchery or other waters, and has already been done as a preliminary measure to evaluate the feasibility of the project. Fish health samples were collected from Avalanche Creek, Ford Creek, and Starvation Creek, and no pathogens were reported.

Project Transportation Needs

Project personnel will hike to the project area for all phases of the project (i.e. removal of Yellowstone cutthroat trout, translocation of native fish, monitoring, etc.). Because there is no trail to Lake Evangeline and due to the weight of the rotenone (anticipated at approximately 12,000 pounds) and other equipment, helicopters will be necessary to transport boats, rotenone, the generator, water

pumps, and possibly other equipment. Helicopters will also be used to transport fish and fish eggs during native fish translocation (including flying collected fish and eggs out of the project area and, as explained above, planting fish into the lakes), since the time required for ground transport and the jostling from using livestock or backpacks would put the fish and/or eggs at risk. Helicopters will deliver and pick up equipment (and fish) by means of long-line sling loads. The number of flights for rotenone application will range from an estimated six to ten flights to bring equipment in and three to six flights to take equipment out, followed by an estimated four round-trip flights per year for six or seven years for translocation. The number of flights will depend on the size of helicopter available at the time (i.e. smaller helicopters carry less weight, resulting in more flights). Glacier National Park limits administrative flights to 50 flights each year. The park conducts additional environmental review and analysis for projects that exceed the 50-flight limit (e.g. rebuilding the Sperry Chalet required a separate EA in part due to the need for additional helicopter flights). To keep the number of administrative flights as low as possible, park staff meet annually to evaluate flight needs and combine flights. The park will make every effort to include helicopter flights for this project within the 50-flight limit on administrative flights. For the purposes of impacts analysis, this EA evaluates flights for this project as if they were in addition to the 50-flight limit. Every effort will also be made to combine flights for this project with other administrative flights. This will also be the case if reapplication of the rotenone is necessary (i.e. flights will be part of the 50-flight limit if possible but may exceed the limit, and flights will be combined with others if possible).

Because Alternative A will affect wilderness character and include uses prohibited under Section 4(c) of the Wilderness Act (motorized equipment and helicopter landings) within recommended wilderness, a minimum requirements analysis (MRA) is required by NPS policy (NPS Management Policies, 6.3.5). An MRA has been prepared and approved.

In addition, the project will implement a number of resource protection measures to minimize the degree and/or severity of adverse effects on aquatic resources; wildlife and species of concern; recommended wilderness and natural soundscapes; wetlands; vegetation and soils; visitor use and experience; and health and safety (see mitigation measures in Appendix A of this FONSI and on pages 9-11 of the EA).

Rationale

Alternative A was selected because it best meets the project purpose to:

- Conserve genetically pure westslope cutthroat trout populations.
- Expand the overall, long-term distribution of native westslope cutthroat trout and native bull trout.
- Complement efforts by MFWP, the US Fish and Wildlife Service (USFWS), and the Flathead National Forest to protect and conserve westslope cutthroat trout and bull trout in the Flathead River ecosystem.
- Protect and enhance recreational opportunities for anglers to fish for native trout.

Changes to the Selected Alternative

The following adjustments have been made to Alternative A since the EA was released for public review. As explained below, only the decision to not translocate sculpin will result in any changes to the analyses of impacts to park resources, since it will result in fewer potential adverse impacts to sculpin.

- The park intends to avoid a second application of rotenone if at all possible. Changes have been made to the text of the EA to clarify that, while a “complete” kill of non-native Yellowstone cutthroat trout will be attempted and could occur, it may not be possible (due to areas of

groundwater inflow where the rotenone is unable to reach the fish, for example). The objective is to remove a sufficient number to protect downstream native westslope cutthroat trout populations from hybridization. Given rotenone's extreme toxicity to fish, it is expected that the majority, if not all, of the Yellowstone cutthroat trout will be removed. Changes have also been made to clarify that translocating genetically pure westslope cutthroat trout will be done not only to establish secure native fish populations, but also to genetically swamp any Yellowstone cutthroat trout that survive the rotenone treatment, and thereby reduce their reproductive potential.

These changes do not alter the analysis of impacts to westslope cutthroat trout because removing most (if not all) of the Yellowstone cutthroat trout combined with genetic swamping will remove the source of hybridization, as well as competition and displacement (as described in the analysis). Analyses would also not change for other impact topics, because the effects described for other aquatic species, recommended wilderness, natural soundscapes, common loons, water birds, grizzly bears, and visitor use and experience are not dependent on the "complete" removal of non-native Yellowstone cutthroat trout. Reasons for dismissing impact topics from detailed analysis in Appendices D and E of the EA are also not dependent on "complete" removal.

- Minor additions have been made to the text of the preferred alternative to: 1) clarify that the rotenone will be applied to the lakes from the motorboats by means of tubing extending into the water from a container in the boat; 2) provide additional description of streamside incubators; and 3) clarify why helicopters are needed to transport equipment (due to the weight of the rotenone and because there is no trail to Lake Evangeline). These additions do not result in any changes to the analysis of impacts because they are merely changes to text for purposes of clarification and do not change methods.
- Slow-release mixtures consisting of rotenone and an inert substance (e.g. sand and unflavored gelatin) have been included as an additional method for applying the rotenone. This method is non-motorized and utilizes a mixing compound that is odorless, inert, and degradable, so will have no additional impacts beyond those discussed in the EA.
- A dye test with a fluorescein dye will be performed prior to the application of rotenone to confirm the stream flow rate. Flourescein is non-toxic, inert, and completely degradable, and will be applied without the use of motorized equipment. Therefore, the dye test will have no impacts to water quality or other park resources beyond those discussed in the EA.
- Translocating sculpin is no longer part of the selected action. This change was made in response to one of the comments received during public review of the EA (see Errata Sheets, Appendix C of this FONSI). This change will cause fewer potential adverse impacts to sculpin, because they will not be handled for translocation purposes.
- Fisheries personnel may camp at Lake Evangeline during project activities. This will not displace visitors, because there are no designated campgrounds at Lake Evangeline. Mitigation measures to avoid or minimize adverse impacts to wetlands, vegetation, and soils (Appendix A of this FONSI) will be in place. Offsite camping permits (which will be required to camp at Lake Evangeline) also include requirements designed to protect park resources (e.g. requirements to stay on bare ground or rocky surfaces whenever possible). For these reasons, there would be no additional impacts beyond those discussed in the EA.

MITIGATION MEASURES

The selected alternative incorporates the mitigation measures listed on pages 9-11 of the EA and Appendix A of this document.

FINDING OF NO SIGNIFICANT IMPACT

CEQ regulations at 40 CFR Section 1508.27 identify ten criteria for determining whether the Selected Action will have a significant effect on the human environment. The NPS reviewed each of these criteria given the environmental impacts described in the EA and determined there will be no significant direct, indirect, or cumulative impacts under any of the criteria.

As described in the EA, the selected alternative has the potential for adverse impacts on native fish and aquatic species, recommended wilderness and natural soundscapes, common loons and other water birds (i.e. ducks, swans, geese, loons, grebes, cormorants, and coots), grizzly bears, and visitor use and experience; however, no potential for significant adverse impacts was identified. These impacts will be minimized through the mitigation measures described in the EA and Appendix A.

Impacts include:

Rotenone and potassium permanganate will cause some mortality of individual westslope cutthroat trout and sculpin that may be present in the stream portion of the treatment area at the time of application. But since only a few individuals will likely be affected, the degree of mortality will be too limited to cause effects at the community or population level. Rotenone will not affect bull trout because it will be detoxified before reaching bull trout populations. The risk of bull trout mortality will be further mitigated by electrofishing the stream portion of the treatment area prior to applying rotenone, and relocating any bull trout that are found to untreated waters downstream.

Amphibian larvae and some macroinvertebrates (aquatic insects) and zooplankton will be killed during rotenone and potassium permanganate applications. Based on post-treatment monitoring of other MFWP applications that indicate the persistence of amphibian populations following treatment, and because amphibian mortality will be limited to the larval stage, local amphibian population abundance will likely recover within a year or two. Mortality to amphibians will also be reduced by implementing the project in late summer/fall, when many amphibian species have developed into terrestrial adults and are no longer susceptible (because they no longer rely on gills to breathe). Studies also show little lasting effect on aquatic insect communities; since some individuals are likely to survive, and because downstream drift and overland migration from untreated waters will aid recolonization, local aquatic insect population abundance will likely recover in two to four years. If necessary, aquatic insect populations will be re-established by translocating individuals from nearby, similar habitat. Zooplankton densities have been shown to recover within a few months of rotenone application, with no change in species diversity, as evidenced by MFWP sampling associated with treatments elsewhere. Based on this, zooplankton communities will likely recover from any effects by the following spring. Since zooplankton primarily inhabit the lakes, most will not be exposed to potassium permanganate and, therefore, will not be affected by it (potassium permanganate will only be applied to the stream).

The translocation of westslope cutthroat trout and bull trout will result in the removal of eggs and/or individuals from donor fish populations. But the donor populations are large enough to support the removal of a small fraction (i.e. less than 10 percent) of the population. To minimize impacts to bull trout from the removal of eggs, females will be only partially spawned, with only about 50 percent of the eggs taken from each female. This will allow for some natural reproduction, producing enough eggs

to fully seed the available juvenile rearing habitat. Maintaining oxygen levels and cold water temperatures during fish collection will mitigate the risk of mortality.

The selected alternative will adversely impact recommended wilderness and natural soundscapes from: 1) the manipulation of the biophysical environment (adversely impacting the untrammeled quality of wilderness character); 2) installation of detoxification equipment, streamside incubators, and fish monitoring devices (adversely impacting the undeveloped quality); 3) the use of motorized watercraft, water pumps, a generator, and helicopters (adversely impacting the undeveloped quality, opportunities for solitude, and natural soundscapes); 4) temporary closure of the treatment area (impacting unconfined recreation); and 5) mortality of native aquatic organisms (adversely impacting the natural condition). Adverse impacts will be limited to a small percentage of the park's recommended wilderness (approximately 0.07 percent of the total acreage of lakes and approximately 0.2 percent of the perennial stream miles). Noise impacts will be temporary, with most of the noise ending when the rotenone application/detoxification process is completed in three to four weeks, followed by intermittent noise from helicopter long-line sling-load operations and fish planting with a helicopter during native fish translocation. This activity will be very infrequent (estimated at four flights per year over the course of six to seven years). Because project noise will attenuate to ambient levels within approximately 3.5 miles (at most) of the treatment area, soundscapes in the vast majority of the park will remain unaffected. Project noise will not represent a change in the overall level and type of noise that already occurs in the park's recommended wilderness (since water pumps and generators are used during backcountry operations, such as trails maintenance, helicopters are used to support administrative work in recommended wilderness, and motorboats currently operate on Bowman and Kintla Lakes for NPS administrative support and on Quartz and Logging Lakes for lake trout suppression). To minimize noise, boat motors and other motorized equipment will be selected for the lowest possible noise production while still meeting project objectives; a heavy-lift helicopter will be used, pending availability, to carry as much material as possible and reduce the number of flights; whenever possible, flights will be included within the park's 50-flight limit on administrative flights and/or will be combined with other administrative flights; and the detox site will be located as far downstream as possible to maximize the potential for rotenone to break down naturally and thus reduce detoxification time and duration of generator noise. Impacts to unconfined recreation will end once the closure is lifted the following spring, and will occur in only a fraction of the park's recommended wilderness (limited to the upper Camas drainage), with the vast majority of park's 927,550 acres of recommended wilderness unaffected. As described for impacts to native fish and aquatic species, impacts to the natural condition of wilderness character will either be temporary or will not affect species at population levels.

If present in the treatment area, common loons and other water birds will not be directly affected by rotenone or potassium permanganate, since treatment concentrations will be far below levels that are toxic to birds (studies show an LD50, or acute lethal dose that kills 50% of subjects, of 2000 ppm and 1680 ppm rotenone for mallards and pheasants respectively [Negherbon 1959], and an LD50 between 21.3-28.1 milligram per kilogram of body weight for seven-day old chicks [Al-Zubaidy and Mohammad 2012]; the selected alternative will use only 1 ppm rotenone, and 2-4 milligrams per liter potassium permanganate). The mortality of fish, amphibian larvae, and some aquatic macroinvertebrates will remove a source of prey for common loons and other water birds that may forage at the lakes. Such impacts will be temporary, lasting until translocated westslope cutthroat trout and bull trout become established and amphibian and aquatic insect populations recover. These prey species will also remain available at other nearby lakes (i.e. Trout, Arrow, and Rogers Lakes and Lake McDonald). Common loons will not likely be rearing young at Camas Lake or Lake Evangeline (there is no previous evidence of loons nesting at either lake, and the lakes are higher in elevation than what is typical for optimal loon nesting habitat). Other water birds may be rearing young at the lakes, however, and the loss of forage could

adversely impact the ability of juvenile birds to forage. This potential impact will be mitigated by surveying Camas Lake and Lake Evangeline prior to implementing the project and, if juveniles of exclusively fish-dependent water birds (including loons) are present, scheduling the application of rotenone as late as possible until September 1, allowing more time for juvenile birds to acquire the ability to fly to nearby, untreated lakes. Additionally, noise from motorboats and helicopters could disturb or displace common loons and other water birds. But many birds typically migrate out of the park by late summer/early fall, displacement habitat at nearby lakes will remain unaffected, and rotenone treatments will not begin until after the critical nesting/brood rearing period. Therefore, any disturbance or displacement due to project noise will not meaningfully alter the availability of resting or foraging habitat for common loons or other water birds, nor observably change common loon and water bird abundance, distribution, or species composition.

The use of motorboats and helicopters could temporarily displace grizzly bears from the treatment area, but impacts will only occur at the individual level, with no population effects and no effects to the overall distribution of bears. This is because adjacent and widespread areas of undisturbed habitat will be available beyond the treatment area, no grizzly bear habitat will be lost, and the project will not cause grizzly bear mortality. Bears scavenging on dead fish will not be affected since rotenone and potassium permanganate treatment concentrations will be far below levels that are toxic to mammals (studies estimate that a 22-pound dog would have to drink 7,915 gallons of rotenone-treated lake water within 24 hours or eat thousands of pounds of rotenone-killed fish to receive a lethal dose [California Department of Fish and Game 1994]; a 0.5-pound rat would need to drink between 84-253 liters of potassium permanganate-treated water at one time to receive a lethal dose, based on an LD50 of 379mg/kilogram for rats [USEPA]), and the majority of the dead fish will be sunk and unavailable to bears. Strict enforcement of attractant storage requirements and training in the appropriate behavior in the presence of grizzly bears will reduce the potential for bears to obtain food rewards, and conservation measures as agreed to with the USFWS in the park's 2018 programmatic biological assessment for administrative flights will mitigate impacts to bears from helicopter flights.

The selected alternative will adversely impact visitor use and experience due to temporary closure of the Camas Lake and Arrow Lake backcountry campgrounds and a portion of the Camas Creek Trail, limited campsites during personnel occupancy, the potential for temporary noise from motorboats, helicopters, and other motorized equipment, and lost opportunities to fish for Yellowstone cutthroat trout in the upper Camas drainage. Impacts from closures will be temporary, ending once the closures are lifted the following spring, and the majority of trails, backcountry campgrounds, and angling opportunities throughout the park will remain unaffected. The presence of personnel over the course of the project will not be noticeably different from that of campers, hikers, and anglers. Since the treatment area will be closed during rotenone application and detoxification, and because the anticipated distance for noise from the motorboats and generators to attenuate to ambient levels (approximately 1.2 and 0.21 miles, respectively) is less than the distance to the nearest trails and summits (approximately 2 miles or more), most visitors will not be near enough to detect the majority of project noise. (The possible exception may be Longfellows Peak, which is just over a mile from Lake Evangeline). Noise will also be reduced by terrain shielding and weather conditions. Water pumps and helicopters may be audible, since water pumps produce a relatively higher noise level and a longer distance is required for helicopter noise to attenuate to ambient levels (up to approximately 3.4 miles, depending on the type of helicopter). But water pumps will be used intermittently, resulting in only sporadic audibility. Noise from helicopters in flight will be highly transient, dissipating in a matter of minutes (or less, depending on masking effects from wind and other weather conditions). Noise from helicopter long-line sling load operations and fish planting with a helicopter in the treatment area will likely be too distant and sufficiently dampened by terrain shielding to be more than barely audible, and

will occur for only a few minutes at a time. Off-trail recreationists within one to three miles of the treatment area could potentially detect project noise, but the likelihood of visitors recreating off-trail near the treatment area is low given the difficult terrain in the upper Camas drainage. The translocation of westslope cutthroat trout will provide new opportunities for visitors to fish for native trout. Advance notification to the park's backcountry permit office about area closures will minimize inconvenience to visitors planning a camping trip in the Camas drainage.

In a biological assessment (BA) and letter submitted to the USFWS in compliance with section 7 of the Endangered Species Act (ESA), the National Park Service determined that the selected alternative may affect, but is not likely to adversely affect the bull trout, bull trout critical habitat, grizzly bear, and Canada lynx. The National Park Service also determined that the selected alternative will not jeopardize the continued existence of the wolverine, meltwater lednian stonefly, and western glacier stonefly, and will have no effect on Canada lynx critical habitat, Spalding's campion (or catchfly), and water howellia. The USFWS concurred with park's determinations on April 8, 2019.

On April 4, 2017, the Montana State Historic Preservation Office (SHPO) notified the park that the SHPO had no comments on the selected alternative. On April 4, 2019, the Tribal Historic Preservation Officer (THPO) for the Confederated Salish and Kootenai Tribes also notified the park that the tribes had no comments. The Blackfeet Nation did not comment on the project.

There will be no significant impacts on natural, cultural or scientific resources or public health, public safety, or unique characteristics of the region. No highly uncertain or controversial impacts, unique or unknown risks, significant cumulative effects, or elements of precedence were identified. Implementation of the NPS selected alternative will not violate any federal, state, or local environmental protection laws.

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CONCLUSION

As described above, the selected alternative does not constitute an action meeting the criteria that normally requires preparation of an environmental impact statement (EIS). The selected alternative will not have a significant effect on the human environment in accordance with Section 102(2)(c) of NEPA.

Based on the foregoing, it has been determined that an EIS is not required for this project and, thus, will not be prepared.

Appendix A – Mitigation Measures

The following mitigation measures will be part of project implementation. These measures have been identified to minimize the degree and/or extent of adverse effects. The level of impacts has been determined assuming these mitigation measures will be implemented.

Aquatic Resources including Fisheries; Threatened, Endangered and Special Status Aquatic Species; Water Quality; and Hydrology

- Prior to applying rotenone, the lower reaches of Camas Creek accessible to bull trout from Arrow Lake will be electrofished to determine if bull trout are present. If any bull trout are found, they will be relocated downstream to Arrow Lake (bull trout are not present in Camas Lake or Lake Evangeline but could be present in Camas Creek upstream of Arrow Lake; see Chapter 3, Table 1).
- To minimize impacts to bull trout from the removal of eggs during translocation, females will be only partially spawned, with only about 50 percent of the eggs taken from each female handled. This will allow for some natural reproduction, producing enough eggs to fully seed the available juvenile rearing habitat.
- Oxygen levels and cold water temperatures will be maintained during native fish collection and transport to prevent fish mortality (e.g. fish could be temporarily held upon collection in tubs submerged in stream water until they are transported in coolers to the hatchery, and/or containers transporting fish will contain sufficient water to maintain oxygen and temperature levels).
- If post treatment sampling indicates populations of aquatic insects have been lost from the treatment area, efforts will be made to re-establish the populations using a nearest neighbor approach, i.e. translocate individual insects from nearby, similar habitat.
- To protect water (and air) quality, the cleanest burning outboard motors available (reduced emission 4-stroke technology) will be used.
- A spill plan will be developed and followed in case of a fuel or hazardous material leak. The plan will be reviewed by the park's Safety Office for comment and approval. Personnel will inspect boat engines, fuel lines, and fittings as well as other equipment for leaks prior to beginning project activities each day. Appropriate absorbent supplies will be on site to address a spill on shore and on the water. Petroleum products will be properly stored, to include the use of spill-proof and bear-proof containers.
- Protocols to prevent aquatic invasive species (AIS) (such as zebra and quagga mussels, and Eurasian watermilfoil) from entering the Camas drainage will be followed at all times, in accordance with the park's Aquatic Invasive Species Action Plan.
- Prior to being loaded with fish and water from the hatchery, helicopter tanks and all fish transport containers will be cleaned of all potential pathogens and contaminants to prevent contamination of the lakes, in accordance with state of Montana rules and regulations for live fish transport. Only hatcheries that are regularly inspected for AIS, certified to be free of pathogens, and/or treat the holding water to remove or kill any pathogens (such as with filters or UV light, for example) will be used.

Wildlife, including federally listed threatened species and state listed species of concern

- Camas Lake and Lake Evangeline will be surveyed for common loons and other water birds before applying rotenone. In the off chance that common loons have nested on the lakes and flightless juveniles are present (this is highly unlikely, as described in the Affected Environment for common loons, but could occur), or if flightless juveniles of other exclusively fish-dependent water bird species are present, the application of rotenone will be scheduled for as late as possible. This will

minimize impacts from the removal of fish to fish-dependent juvenile birds that are unable to fly and forage on nearby lakes. Rotenone will be applied as late in the season as practicable but no later than September 1, by which time juvenile birds should be able to fly.

- The treatment area will be surveyed for black swift nests prior to the rotenone treatment. If nests are found, rotenone will be applied as late in the season as practicable but no later than September 1 to minimize potential impacts to invertebrate forage for juvenile black swifts.
- Project personnel will be trained on appropriate behavior in the presence of bears and other wildlife and will adhere to park regulations concerning proper storage of food, garbage, and other attractants.
- If encountered in project areas, specimens of the state listed smoky taildropper (*Prophysaon humile*, a slug), reticulate taildropper (*Prophysaon andersoni*, a slug), and shiny tight coil (*Pristiloma wascoense*, a terrestrial snail) that are at risk of trampling will be moved to a safe location.
- The following conservation measures as agreed to with the USFWS in the park's programmatic biological assessment for administrative flights are required for all park administrative flights and will be followed for any flights associated with this plan:
    - Flights will follow suggested flight paths away from sensitive areas. Where possible, flight paths will follow road corridors and occur over developed areas.
    - Flights will occur one hour after sunrise and one hour before sunset from 1 May to 1 October to minimize impacts to grizzly bears. Grizzly bear denning activity peaks during den emergence from 15 March to 15 May and during den construction from 15 October to 15 November. No flights will occur over known dens or potential den habitat during den emergence and den construction. In order to conserve prey species, flights will avoid ungulate winter range from 15 January to 1 May when wintering ungulates are most vulnerable.
    - Restricting flights to the 1 May to 1 October period, or minimizing them outside that period, will eliminate or minimize impacts to sensitive wildlife.
    - The helicopter will fly at a minimum of 2000 feet above ground level (AGL) over the park whenever possible, depending on mountainous topography, weather, and except when it is landing or taking off or when it is delivering supplies via long line or during fish planting operations.
    - To minimize impacts on denning Canada lynx, no flights will be permitted over known den sites from 1 May to 1 September.
    - Flight paths will be designated so as to avoid open alpine meadows, talus slopes, or other areas where grizzly bears congregate but do not have access to cover. If a low level flight or landing is needed in an alpine area and a bear is seen, the flight will be postponed. If the flight cannot be postponed, the flight will keep a maximum distance from the bear(s).
    - The flight manager will be responsible for coordinating with the park biologist to identify sensitive sites prior to the flight.

Recommended Wilderness and Natural Soundscapes

- To minimize administrative flights over recommended wilderness, the park will make every effort to include helicopter flights for this project within the 50-flight limit on administrative flights. Flights will be considered with other proposed administrative flights, coordinated with other projects, and combined with other hauling needs whenever possible.
- A heavy lift helicopter will be used, pending availability, to carry as much heavy material as possible and reduce the number of flights. More efficient, lower noise models will be preferred.

- To minimize the duration of generator noise associated with rotenone detoxification, the detox site will be located as far downstream as possible to maximize the potential for rotenone to break down naturally through exposure to water movement and sunlight. This will reduce the detoxification time and, therefore, the duration of generator noise.
- Boat motors and other motorized equipment will be selected for the lowest possible noise production while still using equipment that will meet project objectives.

Wetlands

- The project area will be surveyed for wetland resources before the project begins to identify the presence and extent of wetlands; sensitive wetland resources will be marked and avoided.
- Motorized equipment will not be used for overland transport; personnel will enter the project area on foot.
- Best Management Practices listed in NPS Procedural Manual #77-1, Appendix 2, will be followed as applicable.

Vegetation and Soils

- The project area will be surveyed for rare plants before work begins; locations of rare plants will be marked and avoided.
- Project personnel will stay on trails, rocky surfaces, or bare ground whenever possible and avoid the creation of social trails.
- If necessary, areas of disturbance will be rehabilitated and restored through consultation with the park's Vegetation Management Specialist. Only seeds and plants originating from the park or from approved sources will be used in restoration activities.
- All equipment and materials will be cleaned and inspected prior to entering the park to prevent the spread of non-native invasive plants and AIS.

Visitor Use and Experience

- Interpretive programs and materials will be considered to educate visitors about project activities and native aquatic ecosystem conservation.
- The park's backcountry permit office will be notified in advance of the projected rotenone application and detoxification dates, and when the Arrow Lake or Camas Lake backcountry campgrounds may be occupied by fisheries personnel, to minimize inconvenience to visitors planning a backcountry camping trip in the Camas drainage.
- The park's Concessions Office will be notified of estimated project implementation dates so that this information can be communicated to the concessioner providing horseback rides in the area.

Health and Safety

- All appropriate personal protective equipment (PPE) will be worn by applicators when handling chemicals.

Appendix B – Non-impairment Determination

The NPS Organic Act of 1916 directs the NPS to "conserve the scenery, natural, and historic objects, and wild life in the System units and to provide for the enjoyment of the scenery, natural and historic objects, and wild life in such manner and by such means as will leave them unimpaired for the enjoyment of future generations" (54 USC 100101). NPS Management Policies 2006, Section 1.4.4, explains the prohibition on impairment of park resources and values:

"While Congress has given the Service the management discretion to allow impacts within parks, that discretion is limited by the statutory requirement (generally enforceable by the federal courts) that the Park Service must leave park resources and values unimpaired unless a particular law directly and specifically provides otherwise. This, the cornerstone of the Organic Act, establishes the primary responsibility of the National Park Service. It ensures that park resources and values will continue to exist in a condition that will allow the American people to have present and future opportunities for enjoyment of them."

An action constitutes impairment when its impacts "harm the integrity of park resources or values, including the opportunities that otherwise will be present for the enjoyment of those resources or values" (NPS 2006, Section 1.4.5). To determine impairment, the NPS must evaluate the "particular resources and values 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 impacts. An impact on any park resource or value may constitute impairment, but an impact would 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;
- 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 (NPS 2006, Section 1.4.5).

Fundamental resources and values for Glacier National Park are discussed in the 1999 General Management Plan and 2016 Foundation Plan. Resources that were carried forward for detailed analysis in the EA and are considered necessary to fulfill specific purposes identified in the establishing legislation; are key to the natural or cultural integrity of the park; and/or identified as a goal in relevant NPS planning documents include: native fish and aquatic species, recommended wilderness and natural soundscapes, common loons and other water birds, and grizzly bears. Accordingly, a non-impairment determination is made for each of these resources. A non-impairment determination is not necessary for visitor use and experience because this impact topic is not generally considered a park resource or value subject to the no-impairment standard.

Native Fish and Aquatic Species

Rotenone and potassium permanganate will cause some mortality of individual westslope cutthroat trout and sculpin that may be present in the stream portion of the treatment area at the time of application. But since only a few individuals will likely be affected, the degree of mortality will be too limited to cause effects at the community or population level. Rotenone will not affect bull trout because 1) surveys have not documented bull trout presence in the treatment area, 2) the stream will be detoxified before reaching bull trout populations at Arrow Lake, and 3) the treatment area will be surveyed prior to applying rotenone and any individual bull trout found will be moved downstream to unaffected waters. Amphibian larvae, some macroinvertebrates (aquatic insects), and zooplankton will

be killed during rotenone and potassium permanganate treatments. Based on post-treatment monitoring of other MFWP applications, amphibians will likely recover within a year or two, aquatic insects will likely recover in two to four years, and zooplankton will likely recover by the following spring. Downstream drift and overland migration from untreated waters will aid recolonization. Translocation of westslope cutthroat trout and bull trout will result in the removal of eggs and/or individuals from donor fish populations. Donor fish populations are large enough to support the removal of a small fraction (i.e. less than 10 percent) of the population. To minimize impacts to bull trout from the removal of eggs, females will be only partially spawned, with only about 50 percent of the eggs taken from each female. This will allow for some natural reproduction, producing enough eggs to fully seed the available juvenile rearing habitat. Maintaining oxygen levels and cold water temperatures during native fish collection will mitigate the risk of native fish mortality. For these reasons, the NPS has determined that the selected alternative will not result in impairment of native fish and aquatic species.

Recommended Wilderness and Natural Soundscapes

The selected alternative will impact recommended wilderness and natural soundscapes from the manipulation of the biophysical environment; installation of detoxification equipment, streamside incubators, and fish monitoring devices; the use of motorized watercraft, water pumps, a generator, and helicopters; temporary closure of the treatment area; and mortality of native aquatic organisms. These impacts will not impair recommended wilderness or natural soundscapes because impacts will be limited to a small percentage of the park's recommended wilderness (approximately 0.07 percent of the total acreage of lakes and approximately 0.2 percent of the perennial stream miles), and the vast majority of park's 927,550 acres of recommended wilderness will remain unaffected. Project noise will be temporary and too sporadic and/or localized to measurably change the overall character of natural soundscapes, and will not represent a change in the overall level and type of noise that already occurs in the park's recommended wilderness (since water pumps and generators are used during backcountry operations such as trails maintenance, helicopters are used to support administrative work, and motorboats currently operate on Bowman and Kintla Lakes for NPS administrative support and on Quartz and Logging Lakes for lake trout suppression). To minimize noise, boat motors and other motorized equipment will be selected for the lowest possible noise production while still meeting project objectives; a heavy-lift helicopter will be used, pending availability, to carry as much material as possible and reduce the number of flights; flights will be included whenever possible within the park's 50-flight limit on administrative flights and/or will be combined with other administrative flights; and the detox site will be located as far downstream as possible to maximize the potential for rotenone to break down naturally and thus reduce detoxification time and duration of generator noise. Closure of the treatment area will be lifted the following spring, and impacts to native aquatic organisms will either be temporary or will not affect species at population levels.

Common Loons and Other Water Birds

The mortality of fish, amphibian larvae, and some aquatic macroinvertebrates will remove a source of prey for common loons and other water birds that may forage at the lakes. Impacts will be temporary, until translocated westslope cutthroat trout and bull trout become established and amphibian and aquatic insect populations recover. These prey species will also remain available at other nearby lakes (i.e. Trout, Arrow, and Rogers Lakes and Lake McDonald). Potential impacts to juveniles water birds will be mitigated by surveying Camas Lake and Lake Evangeline prior to implementing the project and, if juveniles of exclusively fish-dependent water birds (including loons) are present, scheduling the application of rotenone as late as possible until September 1. This will allow more time for juvenile birds to acquire the ability to fly to nearby, untreated lakes. Noise from motorboats and helicopters could disturb or displace common loons and other water birds. But many birds typically migrate out of the park by late summer/early fall, displacement habitat at nearby lakes will remain unaffected, and

rotenone treatments will not begin until after the critical nesting/brood rearing period. Therefore, any disturbance or displacement due to project noise will not meaningfully alter the availability of resting or foraging habitat for common loons or other water birds, nor observably change common loon and water bird abundance, distribution, or species composition. For these reasons, there will be no impairment of common loons and other water birds.

Grizzly Bears

The use of motorboats and helicopters could temporarily displace grizzly bears from the treatment area, but impacts will only occur at the individual level, with no population effects and no effects to the overall distribution of bears. Adjacent and widespread areas of undisturbed habitat will be available beyond the treatment area, no grizzly bear habitat will be lost, and the project will not cause grizzly bear mortality. Bears scavenging on dead fish will not be affected since rotenone and potassium permanganate treatment concentrations will be far below levels that are toxic to mammals, and the majority of the dead fish will be sunk in the lake and unavailable to bears. Strict enforcement of attractant storage requirements and training in the appropriate behavior in the presence of grizzly bears will reduce the potential for bears to obtain food rewards, and conservation measures as agreed to with the USFWS in the park's 2018 programmatic biological assessment for administrative flights will mitigate impacts to bears from helicopter flights. As a result, there will be no impairment of grizzly bears.

Conclusion

In conclusion, as guided by this analysis, good science and scholarship, advice from subject matter experts and others who have relevant knowledge and experience, and the results of public involvement activities, it is the Superintendent's professional judgment that there will be no impairment of park resources and values from implementation of the selected alternative. The NPS has determined that implementation of the selected alternative will not constitute an impairment of the resources or values of Glacier National Park. This conclusion is based on consideration of the park's purpose and significance, a thorough analysis of the environmental impacts described in the EA, comments provided by the public and others, and the professional judgment of the decision maker guided by the direction of NPS *Management Policies 2006*.

Appendix C – Errata Sheets (Text Changes and Responses to Comments)

The NPS defines substantive comments as those that 1) question the accuracy of the information in the EA, 2) question the adequacy of the environmental analysis, 3) present reasonable alternatives that were not presented in the EA, or 4) cause changes or revisions in the proposal.

Twenty-one comment letters and two phone calls were received during public review of the EA. Fourteen letters and both phone calls contained substantive comments or otherwise warranted a response or a text change to the EA. Those text changes and comments are addressed below. Two comments resulted in two additional alternatives that were considered but dismissed from detailed analysis. No comments warranted development and detailed analysis of an additional alternative or reconsideration of alternatives that were considered but dismissed. No changes were made in the assessment of environmental consequences that increased the level of adverse impacts.

Text Changes – Strikeout shows what has been removed; bold text is new text added

Text changes have been made for the following reasons:

- Correct errors and make minor editorial changes for clarification.
- Clarify that a complete kill of non-native Yellowstone cutthroat trout could occur but may not be possible, and that the objective is to remove a sufficient number to protect downstream native westslope cutthroat trout populations and enable successful translocation.
- Clarify the method of dispensing rotenone from the motorboats.
- Include slow-release mixtures as an additional method for applying the rotenone.
- Include a fluorescein dye test prior to the application of rotenone to confirm the stream flow rate.
- Remove the translocation of sculpin from the selected alternative.
- Clarify that only westslope cutthroat trout and sculpin may be present in the Camas Creek portion of the treatment area (above Arrow Lake).
- Provide additional description of streamside incubators.
- Clarify why helicopters are needed to transport equipment (due to the weight of the rotenone and because there is no trail to Lake Evangeline).
- Include Lake Evangeline as a possible campsite for fisheries personnel.
- Add an additional mitigation measure for Visitor Use and Experience.
- Add two additional alternatives to Alternatives and Elements of Alternatives Considered but Dismissed from Detailed Analysis (Appendix C of the EA).
- Clarify that the selected alternative (Alternative A) will not increase the chance of grizzly bears in the Camas drainage becoming habituated to people because the crew size will be relatively small (estimated at approximately 15) and the area will be closed to public access.
- Include effects of potassium permanganate to topics where it was not clearly addressed in the EA; none of these effects change the conclusions reached in the analysis.
- Include effects of aquatic insect mortality to wildlife in general; the effects did not change conclusions reached in the dismissal of wildlife from detailed analysis.
- Use consistent units to convey rotenone concentration compared with the EPA standard in the discussion of Human Health and Safety (Appendix D of the EA).

Page 1, 1st paragraph, 2nd sentence

Following the removal of the Yellowstone cutthroat trout, genetically pure (less than one percent non-native genes) native westslope cutthroat trout as well as bull trout ~~and native sculpin~~ would be translocated (i.e. stocked) into Camas Lake and Lake Evangeline.

Page 3, 2nd paragraph, 1st sentence

Alternative A has two components: 1) the removal of Yellowstone cutthroat trout from Camas Lake, Lake Evangeline, and Camas Creek upstream of Arrow Lake, followed by 2) the translocation of westslope cutthroat trout~~, and native sculpin~~ **and** bull trout to Camas Lake and Lake Evangeline.

Page 4, 1st paragraph, 3rd sentence

Rotenone is a fish toxicant applied with the intent of killing fish. It is proposed for this project because, compared with mechanical methods of removing fish (e.g. netting, trapping, electrofishing, and angling), it would remove non-native fish in a period of days as opposed to years, and would **have the best chance of achieving** ~~achieve~~ a complete removal.

Page 4, 3rd paragraph, 1st sentence

Rotenone would be applied to the lakes from motorized watercraft **(by means of tubing extending into the water from a container in the boat)**, such as a zodiac with an outboard motor or small motorboat, and to the stream from drip stations and backpack sprayers.

Page 4, addition to end of 3rd paragraph

Slow-release rotenone mixtures consisting of rotenone and an inert substance (such as sand and unflavored gelatin) would also be used in areas of upwelling to prevent target fish from avoiding exposure in these areas. The rotenone would be released as the mixture breaks down in the water; the mixture would be contained (in a burlap bag, for example) and removed at the end of the treatment.

Page 4, 4th paragraph, 4th sentence

Only one application of rotenone is usually needed for successful treatment. ~~If a complete kill is not achieved, however, a second application may be necessary and could occur during the same or a following year. The application of rotenone would discontinue once treatment is effective, or if it is determined to be ineffective.~~ **Given the extreme toxicity of rotenone to fish, it is expected that the majority (if not all) of the Yellowstone cutthroat trout would be removed. Some individual fish may survive, however, such as in areas of groundwater inflow where the rotenone is unable to reach them. Post-treatment sampling (with nets, electrofishing, angling, and/or sampling DNA from the aquatic environment, for example) would be done to assess the effectiveness of the treatment. If Yellowstone cutthroat trout are present during post-treatment sampling, a second application may be employed during the same or a following year to remove the remaining fish. Also, translocating (i.e. stocking) genetically pure westslope cutthroat trout on top of any remaining Yellowstone cutthroat trout would result in genetic swamping, which would reduce the reproductive potential of any remaining Yellowstone cutthroat trout.**

Page 4, insert between the 4th and 5th paragraph

Prior to the application of rotenone, flourescein, a non-toxic dye, would be applied to the stream and tracked to confirm the flow rate. Flourescein dye is routinely used to study surface and groundwater flow patterns, and is inert and non-toxic. The amount of dye used would be in accordance with

accepted industry standards, product labeling, and protocols, and is estimated to be less than a gallon.

Page 5, 2nd paragraph, last sentence
Since treatments would be at the minimum product concentration necessary ~~to ensure a complete fish kill~~ (1 ppm), levels would be expected to drop below those that are toxic to aquatic life within two to three weeks (i.e. the first half-life would reduce concentrations to 0.5 ppm, well below the lethal level for fish).

Page 5, 3rd paragraph, 1st and 2nd sentences, correction to spelling error
Rotenone breaks down into ~~rotelonone~~**rotenolone**, which is far less toxic to aquatic life but has a longer half-life (Finlayson et al. 2001). In studies of Lake Davis, California, Vasquez et al. (2012) showed ~~rotelonone~~**rotenolone** levels in the water dropping below detection levels within 60 days post-treatment.

Page 5, 4th paragraph, 2nd sentence
While Camas Lake and Lake Evangeline are 100 percent Yellowstone cutthroat trout, westslope cutthroat trout and **native sculpin may be** ~~other native fish are~~ present in Camas Creek upstream of Arrow Lake, within the rotenone treatment area.

Page 5, last paragraph, 3rd sentence
Personnel would likely camp at the backcountry campgrounds at Camas and/or Arrow Lakes, **and may also camp at Lake Evangeline,** for the duration of the rotenone application and detoxification period, anticipated to last approximately three to four weeks (an estimated two to three days for rotenone application and two to three weeks for detoxification).

Page 7, heading for 2nd paragraph
Translocate Native Westslope Cutthroat Trout~~,~~ **and** Bull Trout~~, and Sculpin~~

Page 7, 2nd paragraph
Following the ~~complete~~ removal of Yellowstone cutthroat trout from Camas Lake and Lake Evangeline, bull trout and genetically pure (less than one percent non-native genes) westslope cutthroat trout would be translocated into the lakes. **This would be done not only to establish secure populations of bull trout and westslope cutthroat trout (since non-native fish cannot access the lakes due to downstream waterfalls that prevent upstream fish migration), but also to genetically swamp any remaining Yellowstone cutthroat trout with genetically pure westslope cutthroat trout, and thus reduce the reproductive potential of any remaining Yellowstone cutthroat trout.** ~~Native sculpin would also be translocated into the lakes to establish a holistic native fish assemblage and preserve species interactions (bull trout prey on sculpin, for example)~~…

…~~Native sculpin would be translocated from Trout Lake.~~

Page 7, 3rd paragraph, addition to last sentence
Or, gametes (eggs and sperm) may be collected from spawning adults, fertilized, and reared naturally in stream-side incubators in the new habitat **(if hatchery propagation is not fully successful, for example)**, whereby the fish could swim into the lakes from the stream. **Incubators are typically a small (approximately 8-inch x 8-inch) plastic basket or bucket or similar container that would be filled with gravel and eggs. Incubators would not require the use of any motorized equipment. If used,**

incubators would be in place until the eggs hatch (estimated at approximately two months), and would be checked approximately every two weeks.

Page 8, 1st paragraph

~~Native sculpin would be collected using methods such as electrofishing or fish traps, transported in containers to the release sites, and directly released into upstream areas.~~

Page 8, 2nd paragraph, 4th sentence

Personnel would likely camp at either the Arrow Lake or Camas Lake backcountry campground, **and may also camp at Lake Evangeline**.

Page 8, 3rd paragraph, 4th sentence

Personnel (an estimated two to five-member crew would be anticipated) may need to stay at one of the campgrounds **or camp at Lake Evangeline** if planting operations cannot be completed in one day.

Page 8, 5th paragraph, addition to 2nd sentence

Because there is no trail to Lake Evangeline and due to the weight of the rotenone (anticipated at approximately 12,000 pounds) and other equipment, ~~H~~helicopters would be necessary to transport boats, rotenone, the generator, water pumps, and possibly other equipment.

Page 11, addition to Mitigation Measures for Visitor Use and Experience

The park's Concessions Office would be notified of estimated project implementation dates so that this information can be communicated to the concessioner providing horseback rides in the area.

Page 12, 1st paragraph, correct error to second-to-last sentence

Except for westslope cutthroat trout, bull trout, and sculpin, ~~N~~none of the **other** species found in Rogers Lake are present in upstream lakes due to a waterfall between Rogers Lake and Trout Lake that prevents upstream fish migration.

Page 18, remove from 2nd paragraph

~~There would be some adverse impacts to sculpin during translocation, since eggs and/or individual fish would be removed from the donor population. But the impacts would be temporary and of low intensity, since only a small proportion (less than 10 percent) of the total population would be translocated. This would ensure that the donor population would be demographically strong enough to support the removal. The existence of the donor sculpin population would not, therefore, be threatened.~~

Page 18, 4th paragraph

The change in fish species composition following translocation of westslope cutthroat trout~~,~~ **and** bull trout~~, and sculpin~~ to Camas Lake and Lake Evangeline would not result in new predatory influences that are noticeably different from that of the Yellowstone cutthroat trout currently present.

Page 19, additions to 1st paragraph

Aquatic insects in the treatment area would be affected by rotenone **and potassium permanganate** because they rely on gills for respiration. **In the case of rotenone, s~~S~~**usceptibility varies by species, with caddisflies and mayflies generally more susceptible than stoneflies (Oplinger and Wagner 2014)… Therefore, some mortality of aquatic insects would be expected immediately following the application

of rotenone **and in the vicinity of the potassium permanganate application site (the detox site)**, but it is likely that some would survive ~~rotenone~~ exposure **to both chemicals** within the treated waterbodies.

Page 19, addition to end of 1st paragraph

The toxicity of the potassium permanganate would decline as it reacts with the natural stream environment and the rotenone.

Page 19, removal from 2nd paragraph

~~Sculpin would be an additional predator, foraging primarily on benthic aquatic insects and invertebrates. But the abundance, composition, and distribution of aquatic macroinvertebrates would likely not change substantially as evidenced by diverse and abundant aquatic macroinvertebrate populations in lakes and streams across the park where various species of sculpin are present.~~

Page 20, end of 1st paragraph

Based on these studies, adverse impacts to zooplankton would be expected **from rotenone**, but they would be temporary until the following spring and of no meaningful consequence to zooplankton communities. **Potassium permanganate would likely cause some zooplankton mortality in the vicinity of the detoxification site. But because zooplankton primarily inhabit the lakes, where they would not be exposed to potassium permanganate, impacts to zooplankton communities would not be measurable.**

Page 20, 2nd paragraph

Translocating westslope cutthroat trout~~,~~ **and** bull trout~~, and sculpin~~ to Camas Lake and Lake Evangeline would not noticeably change predation influences on zooplankton. This is because westslope cutthroat trout have similar feeding preferences as Yellowstone cutthroat trout, and because bull trout ~~and sculpin~~ do not typically forage on zooplankton. Therefore, impacts to zooplankton from translocation of westslope cutthroat trout~~,~~ **and** bull trout~~, and sculpin~~ would be very slight, if they occur at all.

Page 22, Conclusion, 6th sentence

Alternative A would have some adverse impacts from the mortality of individual westslope cutthroat trout and sculpin during rotenone treatments, and from the handling of ~~fish~~ **westslope cutthroat trout** and removal of eggs and/or individuals from existing populations during translocation.

Page 25, 3rd paragraph, 2nd sentence

Adverse impacts would occur from removing non-native Yellowstone cutthroat trout and translocating native westslope cutthroat trout~~,~~ **and** bull trout~~, and sculpin~~.

Page 26, 2nd paragraph, 3rd sentence

These benefits would be permanent, since ~~non-native fish would be completely removed from the treatment area and because~~ the treatment area is secure against reinvasion.

Page 32, 3rd paragraph, 3rd sentence and addition after 4th sentence

There would be no direct effects to foraging loons from rotenone **or potassium permanganate**, since treatment concentrations would be far below levels that are toxic to birds. Rotenone would, however, remove a source of food for any loons using the lakes, since it would kill all fish inhabiting the lakes, as well as some amphibian and aquatic macroinvertebrate larvae. **Potassium permanganate would also likely kill some larval amphibians and aquatic macroinvertebrates.** Impacts would be temporary, lasting until amphibians and macroinvertebrates recover (amphibians are estimated to recover by the

following year or two; macroinvertebrates are estimated to recover abundance and community composition and in two to four years)...

Page 33, 5th paragraph
Impacts to other water birds would generally be as described above for common loons. There would be no direct impacts from rotenone **or potassium permanganate**, since treatments concentrations would be below levels that are toxic to birds.

Pages 34-35, addition to 3rd sentence in Conclusion
Treatment concentrations of rotenone **and potassium permanganate** would be far below levels that are toxic to birds…

Page 36, 2nd paragraph, 1st sentence
Alternative A ~~would increase the chance of grizzly bears in the Camas drainage becoming habituated to people, and~~ could increase the risk of potentially dangerous bear-human encounters as project personnel work off trail in densely vegetated riparian areas and/or near rushing water where surprise encounters could occur.

Page 36, 3rd paragraph, 4th sentence
Grizzly bears would not be affected by any consumption of fish killed by rotenone, **nor by potassium permanganate,** since treatment concentrations would be far below levels that are toxic to mammals (as described in Appendix D, Issues and Impact Topics Dismissed from Detailed Analysis, Wildlife).

Page 38, correction to error in 2nd paragraph, 3rd sentence
Closure of the Arrow Lake backcountry campground during project implementation would also impact visitors, but this closure would only be in place for an estimated ~~four to six~~ **three to four** weeks (during rotenone application and detoxification), possibly longer if a second rotenone application is required during the same year.

Page C-1, Appendix C, 1st paragraph
~~Three~~ **Five** alternatives and one alternative element were considered but eliminated from further analysis.

Page C-1, Appendix C, 2nd half of 2nd paragraph
Rotenone, on the other hand, would enable the ~~complete~~ removal of **the majority (if not all) of** the Yellowstone cutthroat trout population~~s~~ in Camas Lake and Lake Evangeline, and is an appropriate choice since the lakes are 100% inhabited by the target species. ~~Complete~~**This level of** removal of the Yellowstone cutthroat trout population from the lakes and the stream above Arrow Lake is necessary to reduce the overall risk of hybridization downstream and to provide secure habitat for translocated westslope cutthroat trout and bull trout.

Page C-1, Appendix C, 4th paragraph
The purpose of the project is to ~~completely~~ remove Yellowstone cutthroat trout from the upper Camas drainage in order to reduce the overall risk of hybridization downstream and provide secure habitat for translocated westslope cutthroat trout and bull trout. As evidenced by previous creel surveys and angler use information (NPS file data and Montana MFISH database), there is not sufficient fishing activity in the Camas drainage for recreational anglers to achieve the ~~complete~~ **sufficient** removal of Yellowstone cutthroat trout from the project area...

…For example, despite a $15/lake trout bounty on Lake Pend Oreille in Idaho for almost a decade, anglers alone have not been able to suppress ~~(let alone completely remove)~~ lake trout from the lake.

Page C-2, addition to Appendix C, Alternatives and Elements of Alternatives Considered but Dismissed from Detailed Analysis

Translocate only westslope cutthroat trout without also translocating bull trout. Part of the purpose of the project is to establish secure bull trout populations that are secure against non-native fish and climate change, and to expand the overall, long-term distribution of bull trout. The presence of invasive non-native lake trout in Rogers Lake has likely put the lake's bull trout population at risk. This is based on what is known about how lake trout have affected bull trout elsewhere in the park, where lake trout have driven several bull trout populations to a near risk of functional extinction. The Rogers Lake bull trout population may also be especially vulnerable to habitat degradation from climate change, since the lake is shallow (approximately 14 feet) and particularly susceptible to increases in water temperatures. Camas Lake and Lake Evangeline are deeper and at higher elevation, and cannot be invaded by non-native fish due to downstream waterfalls that prevent upstream fish migration. The lakes therefore present a valuable opportunity to establish secure habitat for bull trout. Bull trout and westslope cutthroat trout populations coexist in multiple waters throughout the park, including downstream of the project area in Trout and Arrow Lakes. Both species have evolved together over thousands of years, and there is sufficient habitat diversity (i.e. stream habitat, spring channels, shallow lake habitat, deep lake habitat) for translocation of both species to succeed. The translocation of westslope cutthroat trout alone was dismissed from further analysis because it would not fully meet project objectives or resolve the purpose and need for taking action.

Page C-2, addition to Appendix C, Alternatives and Elements of Alternatives Considered but Dismissed from Detailed Analysis

Swamp Camas Lake and Lake Evangeline with genetically pure westslope cutthroat trout without first removing Yellowstone cutthroat trout with rotenone. Simply stocking genetically pure westslope cutthroat trout on top of a well-established and healthy Yellowstone cutthroat trout population would likely result in a hybrid swarm of westslope-Yellowstone cutthroat trout. Annual stocking of pure westslope cutthroat trout for multiple generations would be required under this approach, with a low probability of success of establishing a genetically pure population of westslope cutthroat in the end. This alternative would also be limited by the availability of donor sources, and would cause impacts to donor sources from annual long-term removal of sub-adult fish to provide spawning stock. Genetic swamping would occur under the preferred alternative by means of translocation; translocation is in part being proposed not only to establish secure populations of native westslope cutthroat trout and bull trout, but also to genetically swamp any Yellowstone cutthroat trout that remain after rotenone treatments. The chances of successfully swamping out any remaining Yellowstone cutthroat genes would be greatly increased by first dramatically reducing the number of Yellowstone cutthroat trout in the lakes. Therefore, this alternative was dismissed from detailed analysis because it would not remove the threat of hybridization and, as a result, would not resolve the purpose and need for taking action.

Page D-1, Appendix D, 3rd paragraph

Wetland soils and vegetation in the project area would be at some risk of trampling. Impacts from trampling would be slight, however, and would not measurably exceed the existing human influence from hikers and anglers since, during rotenone application, project personnel (with a crew size estimated at approximately 15 people) would ~~only~~ **primarily** use the shoreline around the lakes and stream intermittently for an estimated period not likely to exceed two to three days. The potential for

impacts from trampling would be very fleeting during activities such as surveys, monitoring and preliminary site preparations. There would be a higher potential for trampling **if project personal camp at Lake Evangeline, and** during the detoxification period, since project personnel would be at the detox site for a longer period of time, estimated at up to two to three weeks.

Page D-2, Appendix D, 2nd paragraph

The use of rotenone would not affect wetland vegetation, since rotenone is not known to be toxic to plants at the concentration that would be used (Finlayson et al. 2010). **Similarly, potassium permanganate would not negatively impact wetland vegetation at the levels proposed (approximately 3 ppm). Potassium permanganate is a strong oxidizer that rapidly breaks down (half-life of 7-11 minutes) into potassium, manganese, and water, and is also used by water treatment plants to remove foul odors from drinking water. The break-down products are common in nature and have no deleterious environmental effects at concentrations used for neutralization of piscicides (Finlayson et al. 2000).** ~~Rotenone would also not affect wetland soils and hydrology.~~ As a non-persistent chemical, rotenone breaks down quickly and does not accumulate in the water, soil, plants, or surviving animals (ODFW 2019). Rotenone has low to slight mobility in soil, with an expected leaching distance of about two centimeters, and binds to organic matter (ODFW 2019). The likelihood of the chemical leaching into groundwater, therefore, is extremely low (see also dismissal of impacts to Water Quality, below). **Neither chemical would affect wetland soils and hydrology**. None of the project activities would cause physical alterations to water flow patterns within wetlands.

Page D-3, Appendix D, 3rd paragraph, addition to Floodplains

The use of rotenone **and detoxification of the rotenone with potassium permanganate** would not affect floodplain function or value, nor present a risk to life/safety or capital investment.

Page D-4, Appendix D, addition to Water Quality

There would be no impacts to water quality from a dye test with fluorescein, because fluorescein is inert, non-toxic, and completely degradable.

Page D-4, Appendix D, correction to spelling error for citation

Mallards and pheasants had an LD50 (lethal dose needed to kill 50% of the test subjects) of 2000 parts per million and 1,680 parts per million, respectively (~~Negerhbon~~ **Negherbon** 1959).

Page D-5, Appendix D, addition after 1st paragraph

The application of potassium permanganate to detoxify the rotenone would not impact wildlife because concentrations would be far below levels that are toxic to birds and mammals. The USEPA identified several manganese dietary studies of rats and reported and LD50 (acute lethal dose that kills 50% of the rats in the study) of 379mg/kg in one study. Other studies showed higher LD50's. Using this value, an average rat weighing about 0.5 pound would need to drink, at one time, between 84-253 liters of potassium permanganate-treated water to receive a lethal dose. Other research investigating the effects of manganese neurotoxicity in 7-day old chicks documented an LD50 between 21.3-28.1 mg per kilogram of body weight for intraperitoneal, intramuscular, and subcutaneous exposure, and 469.5 mg per kilogram of oral exposure (Al-Zubaidy and Mohammad 2012). Therefore, at the anticipated neutralization rate (2-4 milligrams per liter) that will be used for this project, it will not be possible for birds or mammals in the treatment area to receive an acute dose. Toxic effects to wildlife are also not possible over the long term because potassium permanganate will only be applied for a period of approximately two to three weeks, and its components will completely dissipate over time (by the following spring if not sooner).

Page D-5, Appendix D, addition to Wildlife

Rotenone treatments could cause reduced emergences of flying aquatic insects. But this would not measurably affect forage for bats, birds, and other wildlife species since a multitude of non-aquatic insects would remain; aquatic insects would be available in nearby, untreated waters and would migrate overland; other sources of food relied upon by non-insectivorous species (such as seeds, berries, vegetation, and other pretty) would remain unaffected; and aquatic insect species composition and abundance would likely return to pre-treatment conditions in two to four years.

Therefore, wildlife have been dismissed from detailed analysis because there would be no adverse impacts from rotenone **or potassium permanganate**; any disturbance or displacement effects would be temporary; widespread adjacent, undisturbed habitat would remain available; and impacts to the availability of fish **and aquatic insects** as a source of food would be temporary and of little consequence given the availability of other prey and/or fish in nearby lakes.

Page D-7, Appendix D, middle of 1st paragraph (text change to use consistent unit measurements)

The EPA standard for safe drinking water threshold is ~~0.8 ppm (~~40 ppb~~)~~ rotenone**,** which is only 20 percent below the ~~1 ppm~~ **50 ppb** target application concentration (M. Boyer, MFWP, personal communication).

Page D-7, Appendix D, addition to Human Health and Safety

When potassium permanganate is combined with rotenone, the rotenone is oxidized and the potassium permanganate is reduced to potassium, manganese oxide (found naturally in the earth's crust), and water (USFWS 2015). The recommended daily allowance for potassium is 4,700 mg/day for an average adult. An average banana has about 422 mg of potassium. At a concentration of 1-3 mg/liter potassium permanganate that would be applied to the treatment area for this project, the amount of potassium would be far too low to present any threat of toxicity. Manganese is an essential element in humans and is required at low levels but can be harmful at high levels. Fruits and nuts are naturally rich in manganese. The reference dose (RfD) (the consumption level below which no adverse impacts are expected over a lifetime of exposure) for manganese in food is about 10 mg/day (USEPA 2003). Manganese may be more readily absorbed by the body from water, so the RfD for manganese in drinking water reflects the application by EPA of a safety factor of 3. This results in the consumption RfD in water of 3.29 mg/day for an average size person (USEPA 2003). At the concentrations that would be used for this project (2-4 milligrams per liter), a person would have to drink more than three liters of water from the treatment area every day for life at undiluted levels (the concentration would dilute over time) for a potential effect. Since potassium permanganate would only be applied for an estimated 2-3 weeks, this level of exposure is not possible. In addition, the project area would be closed to the public, so humans would not be exposed to water treated with potassium permanganate.

NPS Responses to Comments

1. ***Concern Statement:*** The EA did not consider genetic swamping with native fish exclusively (i.e. instead of using rotenone to remove the Yellowstone cutthroat trout, just translocate enough westslope cutthroat trout into the lakes to genetically swamp the Yellowstone cutthroat trout). What is the current population size and structure of Yellowstone cutthroat trout in the lakes? If reproductive success is low for Yellowstone cutthroat trout, swamping them with westslope cutthroat trout may be possible without the use of rotenone.

   Response: *Text has been added to Appendix C of the EA, Alternatives and Elements of Alternatives Considered but Dismissed from Detailed Analysis, explaining why this approach alone, without first removing Yellowstone cutthroat trout with rotenone, was dismissed. Text has also been added to the preferred alternative to clarify that, after treating with rotenone, translocating genetically pure westslope cutthroat trout on top of any Yellowstone cutthroat trout that remain will, in effect, result in genetic swamping. Recent fish surveys of Camas Creek, Camas Lake, and Lake Evangeline (Galloway 2014) documented the presence of multiple age-classes of Yellowstone cutthroat trout, indicating a regularly reproducing population. The fish ranged in size from approximately 2 to 12 inches in length. Single overnight gill net sets in Camas Lake and Lake Evangeline captured 8 and 9 Yellowstone cutthroat trout, respectively (Galloway 2014). For comparison, a similar overnight gill net set in Grace Lake, located to the north of the project area, captured 11 Yellowstone cutthroat trout (Galloway 2014). Two gill nets set in Hidden Lake in 2011 caught 13 and 18 Yellowstone cutthroat trout, respectively (NPS file data). Because both Hidden and Grace Lakes are known to have abundant populations of Yellowstone cutthroat trout coupled with the similarity in catch rates of all four lakes suggests that both Camas Lake and Lake Evangeline also have abundant populations of Yellowstone cutthroat trout. Regular recruitment coupled with the abundant fish populations would render a swamping approach without first reducing the existing Yellowstone cutthroat trout population unlikely to succeed in eliminating the hybridization threat posed by this population. By first dramatically reducing the number of Yellowstone cutthroat trout in the lakes, the chances of successfully swamping out any remaining Yellowstone cutthroat genes is greatly increased when genetically pure westslope cutthroat trout are translocated.*

2. ***Concern Statement:*** Consider delaying the translocation of bull trout until 2025 to allow time to study the outcome of the Logging Lake project and any unintended effects.

   Response: *The introduction of bull trout will follow the establishment of westslope cutthroat trout in Camas Lake and Lake Evangeline. Translocating bull trout is expected to take several years, allowing time to learn from the Logging-Grace bull trout translocation project***.**

3. ***Concern Statement:*** Recommend against translocating sculpins. There is no evidence that sculpin are in decline and need to be translocated, many bull trout streams function fully without sculpin, and it is not known how the benthic community in the stream would react to a new species.

   Response: *The selected alternative has been changed such that sculpin will not be translocated. See text changes to pp. 1, 3, 7, 18-20, 22, and 25.*

4. ***Concern Statement:*** The EA does not include a monitoring plan for the project. The project should include a monitoring plan with specific measurable goals and objectives, such as a target number of westslope cutthroat trout in a given water within 10 years of translocation.

   Response: *The EA explains on p. 6 that post-treatment monitoring will follow established monitoring protocols in Montana's Piscicide Policy. A specific target number is not necessary and would not be meaningful, because the success of the project is not measured by a given number of fish per unit area. Rather, the measurable goal for success is establishing self-sustaining populations of westslope cutthroat and bull trout in Camas and Evangeline Lakes, whatever the carrying capacity for the natural habitat. This will be documented using standard fish population sampling approaches including spawning surveys, netting, trapping, snorkeling, and/or electrofishing. If successful natural reproduction and population maintenance can be demonstrated over time, the project will have been successful.*

5. ***Concern Statement:*** Any shared trail use must be communicated to the horseback concessioner to maintain safety for guests and horses. Since the number of trails used for horseback rides in the north Lake McDonald area are limited, trails used by the concessioner must not be closed for this project. Any necessary closures should be scheduled outside the concessioner's peak operating season from June 15th to Labor Day, or the concessioner's season should be extended.

   Response: *The segment of the Camas Lake Trail that will be closed is well beyond the trail segment used by the horseback ride concessioner. No other trails will be closed. The presence of project personnel hiking to and from the project area will not be noticeably different from that of other hikers, NPS trail crews, etc. The park's Concessions Office will be notified of estimated project implementation dates so that this information can be communicated to the concessioner. Text has been added to include this as a mitigation measure under Visitor Use and Experience.*

6. ***Concern Statement*:** How does the NPS justify lethally removing populations of Yellowstone cutthroat trout, since the species is listed in Montana as a species of concern? Yellowstone cutthroat trout are declining in other areas because of climate change, and Yellowstone cutthroat trout transplanted to Banff National Park are a protected species.

   Response: *The Yellowstone cutthroat trout is a species of concern in Montana due to population declines, threats from invasive fishes, and habitat loss/alteration <u>in its native range</u> (the Yellowstone River drainage). The species was artificially introduced to Glacier National Park, which is well outside its native range. Therefore, the Yellowstone cutthroat trout is a non-native species in the park. NPS policy directs the National Park Service to manage, up to and including eradication, non-native species that interfere with the perpetuation of native species or disrupt the genetic integrity of native species (NPS Management Policies 2006, Section 4.4.4.2). The Multi-species Action Plan for Banff National Park states: "The main threats to Westslope Cutthroat Trout are competition with non-native trout (e.g. brook trout), and hybridization with non-native rainbow trout and Yellowstone cutthroat trout" (Parks Canada Agency 2017). Also, results from a search of special status species on the Wild Species Status Search page on the Alberta Environment and Parks website do not include Yellowstone cutthroat trout (http://aep.alberta.ca/fish-wildlife/species-at-risk/wild-species-status-search.aspx).*

7. ***Concern Statement:*** Yellowstone cutthroat trout in Camas Lake and Lake Evangeline are part of the historic fishery fundamental to the designation of Glacier National Park as a biosphere reserve and World Heritage Site.

   Response: *The World Heritage Site nomination for Waterton-Glacier International Peace Park states: "Glacier National Park provides one of the last strongholds for the native species of Westslope Cutthroat Trout, and contains around 98% of the remaining genetically pure stock in existence." The Glacier Biosphere Reserve designation states: "to conserve for present and future human use the diversity and integrity of biotic communities and to safeguard the genetic diversity of species." The biosphere designation does not reference non-native species, such as Yellowstone cutthroat trout. Rather, both of these statements reflect the need to protect the genetic integrity of the park's native westslope cutthroat trout from the effects of non-native species.*

8. ***Concern Statement:*** Yellowstone cutthroat trout are not hybridizing with westslope cutthroat trout downstream of Camas Lake and are not causing severe downstream effects. After 100 years of Yellowstone cutthroat trout upstream, Arrow Lake is still close to 98% pure westslope cutthroat trout. This means that in another 100 years, there will be close to 96% pure westslope cutthroat trout. Only a few Yellowstone cutthroat trout likely survive the waterfalls downstream of Camas Lake.

   Response*: A recent park-wide westslope cutthroat trout genetic assessment identified Yellowstone cutthroat trout hybridization with westslope cutthroat trout in Arrow and Rogers Lakes. Yellowstone cutthroat trout hybridization does not appear to spread as rapidly as hybridization with rainbow trout, but it is occurring none-the-less. While levels of hybridization between westslope cutthroat trout and Yellowstone cutthroat trout are currently low, the continued upstream presence of Yellowstone cutthroat trout presents an ongoing risk to westslope cutthroat trout. Left unchecked, hybridization with Yellowstone cutthroat trout will eventually diminish the current genetic integrity of downstream westslope cutthroat trout populations. The rate at which this would occur is uncertain, since hybridization can be influenced by multiple factors, including changing population demographics and habitat conditions. NPS policy does not permit non-native species to adversely impact native species if it can be avoided. Data regarding fish survival in the high gradient reach of stream is not available, but the evidence of hybridization downstream is evidence that enough fish can survive the trip.*

9. ***Concern Statement:*** Why is the NPS also translocating bull trout to Camas Lake and Lake Evangeline? Won't the bull trout eat all the translocated westslope cutthroat trout?

   Response: *The NPS is translocating bull trout because Camas Lake and Lake Evangeline offer valuable opportunities to establish bull trout populations that are secure against the combined threats of non-native invasive fish and habitat degradation occurring as a result of climate change. Project objectives include expanding the overall long-term distribution of bull trout (EA, p. 2). Bull trout and westslope cutthroat trout populations coexist in multiple waters throughout the park, including downstream of the project area in Trout and Arrow Lakes. Both species have evolved together over thousands of years, and there is sufficient habitat diversity (i.e. stream habitat, spring channels, shallow lake habitat, deep lake habitat) for translocation of both species to succeed. Westslope cutthroat trout are also anticipated to be translocated first, which would give them time to mature and become established prior to the translocation of bull trout.*

Text has been added to Appendix C of the EA to include translocating only westslope cutthroat trout as an alternative considered but dismissed from detailed analysis.

10. ***Concern Statement:*** The EA does not adequately address ecosystem effects, including to microbes, other creatures, and ground water. The EA does not discuss toxic effects of rotenone and potassium permanganate, but treats them as harmless; rotenone and potassium permanganate are not harmless. Does combining potassium permanganate with rotenone result in any toxic byproducts?

    Response: *The EA addresses impacts of rotenone to westslope cutthroat trout and bull trout (pp. 16-17); amphibians (p. 18); aquatic macroinvertebrates (p. 19); zooplankton (p. 19); common loons and other water birds (pp. 32-33); grizzly bears (p. 36); wetland vegetation, floodplains, surface and groundwater, wildlife, and human health and safety (Appendix D, pp. D-2 to D-4 and D-6). The EA includes the impacts of potassium permanganate to westslope cutthroat trout and bull trout, amphibians, two state listed aquatic macroinvertebrate species (*Z. cordillera and P. columbiae*), water quality, and human health and safety. Text has been added to the discussion of impacts to other aquatic macroinvertebrates, common loons and other water birds, grizzly bears, wetlands, floodplains, and wildlife to clarify that potassium permanganate will not affect these resources. Further discussion regarding potassium permanganate has also been added to the section on Human Health and Safety (Appendix D in EA, pp. D-6 and D-7).*

    The rotenone product we will be employing is CFT Legumine. Following requirements set forth in the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), the EPA conducts thorough scientific reviews of approved registered products to reassess potential hazards arising from the currently registered uses, to determine the need for additional data on health and environmental effects, and to determine whether the pesticide meets the "no unreasonable adverse effects" criteria of FIFRA. EPA has a current Reregistration Eligibility Decision for rotenone and has concluded that applying the product according to label instructions does not pose a serious risk of adverse impacts to people or the environment (as stated in Appendix D of EA, p. D-7).

    Toxicity studies for rotenone indicate mammalian toxicity at levels of ≥ 39 ppm. When CFT Legumine rotenone is applied to waters at the 1 ppm target concentration (the application rate for this project), the concentration of rotenone, once mixed, will initially be as high as 0.050 ppm. Thus, during the time of piscicide application, concentrations of rotenone will be nearly 800 times less than documented mammalian toxicity concentrations.

    When potassium permanganate is combined with rotenone, the rotenone is oxidized and the potassium permanganate is reduced to potassium, manganese oxide (found naturally in the earth's crust), and water (USFWS 2015). The recommended daily allowance for potassium is 4,700 mg/day for an average adult. An average banana has about 422 mg of potassium. At a concentration of 1-3 mg/liter potassium permanganate that will be applied to the treatment area for this project, the amount of potassium will be far too low to present any threat of toxicity. Manganese is an essential element in humans and is required at low levels but can be harmful at high levels. Fruits and nuts are naturally rich in manganese. The reference dose (RfD) (the consumption level below which no adverse impacts are expected over a lifetime of exposure) for manganese in food is about 10 mg/day (USEPA 2003). Manganese may be more readily absorbed by the body from water, so the RfD for manganese in drinking water reflects the application by EPA of a safety factor of 3. This results in the consumption RfD in water of 3.29 mg/day for an average size person (USEPA 2003). At the concentrations that will be used for this project (2-4 milligrams per liter), a person would have to drink more than three liters of water

from the treatment area every day for life at undiluted levels (the concentration will dilute over time) for a potential effect. Since we are only going to be applying the potassium permanganate for an estimated 2-3 weeks, this level of exposure is not possible. In addition, the treatment area will be closed to the public, so humans will not be exposed to water treated with potassium permanganate.

When it comes to smaller mammals, the USEPA identified several manganese dietary studies of rats and reported an LD50 (acute lethal dose that kills 50% of the rats in the study) of 379mg/kg in one study. Other studies showed higher LD50s. Using this value, an average rat weighing about 0.5-pound would need to drink, at one time, between 84-253 liters of potassium permanganate-treated water to receive a lethal dose. Other research investigating the effects of manganese neurotoxicity in 7-day old chicks documented an LD50 between 21.3-28.1 mg per kilogram of body weight for intraperitoneal, intramuscular, and subcutaneous exposure, and 469.5 mg per kilogram of oral exposure (Al-Zubaidy and Mohammad 2012). Therefore, at the 3 ppm neutralization rate (approx. 2-4 milligrams per liter) that will be used for this project, it will not be possible for birds or mammals in the treatment area to receive an acute dose. Toxic effects are also not possible over the long term because potassium permanganate will only be applied for a period of approximately two to three weeks, and its components will completely dissipate over time (by the following spring if not sooner).

The safety data sheets (SDS) for rotenone and potassium permanganate are available upon request.

11. ***Concern Statement:*** Potassium permanganate causes fish to be susceptible to bacterial and fungal infections. (Comment cites paper by Dustin Hinson, Rotenone Characterization and Toxicity in Aquatic Systems, University of Idaho, Principles of Environmental Toxicity, November 2000).

    Response: *Hinson was referring to using a potassium permanganate solution of unspecified strength to revive fish that had been dosed with rotenone. We will use potassium permanganate to neutralize the rotenone in the water at a level that will result in sub-lethal concentrations of free permanganate in the water. The EA includes the concentration ratio and estimated amount of potassium permanganate that would be used (p. 5).*

12. ***Concern Statement:*** Rotenone products often include toxic solvents such as trichloroethylene, xylene, trimethylbenzene, naphthalene, 1-m-naphthalene, 2-m-naphthalene, toluene and piperonyl butoxide.

    Response: *None of the chemicals listed in the concern statement are included in the CFT Legumine rotenone formulation that will be used for this project. The chemicals trichloroethylene, xylene, trimethylbenzene, naphthalene, 1-m-naphthalene, 2-m-naphthalene, and toluene are all from current or past Prenfish formulations, and the piperonyl butoxide was the synergist in the old 2.5% formulation (D. Skaar, MFWP, personal communication). The CFT legumine rotenone formulation replaces many of the emulsifying agents found in other commercially available formulations with soy-based compounds that quickly degrade in the environment. Inert ingredients in the CFT Legumine formulation include diethylene glycol ethyl ether (DEGEE) and M-pyrrolidone. DEGEE and M-pyrrolidone are used as solvents to aid in the dissolution of the rotenone (Vasquez et al. 2012). Toxicity studies for DEGEE and M-pyrrolidinone indicate mammalian toxicity at levels of 4,500 ppm and 4,000 ppm, respectively. When CFT*

Legumine rotenone is applied to waters at the 1 ppm target concentration (the application rate for this project), the concentration of DEGEE and M-Pyrrolidone will be 0.56 ppm and 0.10 ppm, respectively. Thus, within the project area, concentrations of DEGEE will be approximately 8,000 times less and concentrations of M-pyrrolidone will be approximately 40,000 times less than documented mammalian toxicity concentrations.

13. ***Concern Statement:*** What other toxicants may be used?

    Response*: No other toxicants will be used; only rotenone, since it is the only one registered and approved for use by the EPA.*

14. ***Concern Statement:*** Antimycin is often used with rotenone and can adversely impact aquatic macroinvertebrates.

    Response: *Antimycin was not proposed in the EA and will not be used.*

15. ***Concern Statement*****:** Wildlife drinking water from downstream of the treatment area during and within a week after the application period will ingest rotenone at a level that is over the EPA standard. This could lead to death or acute toxicity. Blood and tissue samples should be taken from any dead animals found in the area, with the results made available to the public. Will there be a publicly available database that tracks dead or sick animals?

    Response: *The low toxicity of rotenone to mammals and birds is described in Appendix D, p. D-4, under Wildlife. Acute toxicity to wildlife from consuming water (or dead fish) is not possible because the rotenone will be applied as a diluted product. Given the extremely high quantities of rotenone-treated water (several thousand gallons, based on studies by the California Department of Fish and Game) that an animal would need to drink within 24 hours of treatment to receive a lethal dose, it is extremely unlikely, if not impossible, that any animal could receive an acute dose of rotenone from a properly implemented application. Chronic toxicity, compared with acute toxicity, occurs from exposure over a long time, on the order of a lifetime. The EPA safe drinking water standard for rotenone for chronic exposure is 40 ppb (based on the most sensitive group – infants and children). Based on an estimated half-life of rotenone of up to 7 days, treated water is expected to fall below 40 ppb rotenone within the first three to four days following the application and continue to degrade to the point of non-detection over the fall and winter months. Therefore, since chronic exposure would require animals to drink water above 40 ppb rotenone for prolonged periods of time (on the order of years), and because water will be less than 40 ppb in a matter of days, it will not be possible for wildlife to experience chronic toxicity from ingesting treated water. Since no wildlife mortalities are expected, there are no plans to maintain a mortality database. Any unexplained wildlife mortalities within a given species' range of the treatment area will be investigated. See also response to Concern Statement 10.*

16. ***Concern Statement:*** When MFWP applied rotenone to Tetrault Lake near Eureka, Montana, the dragonflies did not come back for ten years, the frogs completely disappeared, and human health was affected. Another application at Bass Lake, also near Eureka, was cancelled due to opposition from landowners around the lake who were concerned about toxic effects.

    Response: *Tetrault Lake was treated with rotenone in the late 1990s (MFWP, personal communication). The effects to dragonflies and frogs cannot be confirmed because post-*

treatment data for dragonflies and frogs was not collected at the time and, therefore, is not available. Monitoring of zooplankton following the Tetrault Lake treatment showed no change in zooplankton species composition. Protocols for post-treatment monitoring now include monitoring of amphibians and aquatic insects, in addition to zooplankton. In the EA for the current project, the analysis of impacts to amphibians and aquatic insects and the selection of Alternative A is supported by numerous case studies from 21 alpine lakes and stream networks in the South Fork of the Flathead watershed that were treated with rotenone (see EA, p. 19). Pre- and post-treatment evaluations of these projects are still underway, and all include monitoring sites at lake outlet streams, which receive the longest duration of rotenone exposure and, therefore, represent areas that would experience the greatest effect on non-target species. Post-treatment monitoring from these studies document the recovery of amphibians and aquatic insects within one to four years of rotenone application (1 to 2 years for amphibians; 2 to 4 years for insects) (Matt Boyer, MFWP, personal communication). Also, rotenone concentrations vary depending on the target species; for example, trout are relatively sensitive and catfish are more tolerant. Because this project will use a lower concentration of rotenone than was necessary to treat Tetrault Lake, a less pronounced effect to amphibians and aquatic insects than described in the concern statement is anticipated. The selection of Alternative A is also based on Environmental Protection Agency (EPA) registration and approval of rotenone, and numerous studies that do not show adverse effects to human health when the product is property applied (Appendix D of the EA). See also response to Concern Statements 10 and 12.

The rotenone treatment at Bass Lake was not completed due to the landowner withdrawing support, opposition from adjacent landowners, and additional surveys which found northern pike to be more broadly distributed in the watershed than previously thought, making the project unlikely to succeed.

17. ***Concern Statement:*** One commenter stated that rotenone and/or solvents combined with it can become airborne, putting human health at risk.

    Response: *Rotenone formulations will not become airborne, because a liquid formulation will be used. More than 99% of the total volume will be applied below the water surface from a boat, by means of tubing extending into the water from a container inside the boat. The remainder will be applied with drip stations (e.g. drip bag or other container on shore with tubing extending into the water), slow-release mixtures prepared in a laboratory environment ahead of time and dropped into the water, and hand pumps affixed to backpack sprayers. Backpack spraying will occur in areas that are hard to reach with other methods and which may harbor target fish (such as backwaters). Backpack spraying will entail use of the hand pump to apply a mist over the surface of the water. Because the formulation is in liquid form, it will sink to the water and will not become airborne. Rotenone will also not evaporate from the water surface because it stays in solution. Rotenone is unstable and breaks down rapidly in the water by sunlight and turbulence (as described in the EA on pp. 4-5). Project personnel applying the rotenone must nevertheless wear respirators in accordance with standard operating procedures for personal protective equipment (PPE) when applying chemicals. See also responses to Concern Statements 10 and 12.*

18. ***Concern Statement:*** The eradication of northern pike with rotenone from Lake Davis in California and effects of the treatment need to be considered.

Response: *The Lake Davis project (2007) is now used as a case study in the current USFWS Rotenone Application Course to improve the success of other rotenone projects. The initial application failed to remove northern pike, but a second application was much more successful. There was strong public opposition to the initial application, with opponents citing concerns about drinking water. Public opposition waned for the second application, as more comprehensive information was made available to the public regarding no adverse effects to drinking water and human health when rotenone is properly applied. Vasquez et al. (2012) reported on the environmental fate of the rotenone product CFT Legumine following the Lake Davis treatment. The authors reported half-lives for the primary constituents listed on the product's SDS sheet: rotenone, methyl pyrrolidone (MP), and diethylene glycol monethyl ether (DEGEE). None of these components are considered persistent in the environment nor subject to bioaccumulation (Vasquez et al. 2012). The authors reported the concentrations of these constituents rapidly declined in Lake Davis following treatment. Specifically, MP and DEGEE "most likely degraded in place via microbes or sunlight because their physicochemical properties would have limited volatilization, sorption, and bioaccumulation." The half-life of rotenone in Lake Davis water was 5.6 days. MP and DEGEE had similar half-lives to the rotenone. After 212 days, there was no trace of the formulation in the water or the lake sediments of Lake Davis.*

19. ***Concern Statement:*** According to the Montana Bull Trout Scientific Group's paper, Assessment of Methods for Removal or Suppression of Introduced Fish to Aid in Bull Trout Recovery, it is more difficult to use toxicants in lakes with springs and inlets and outlets, and the toxicant must be reapplied every few years (two years in a row on a reach of stream) because target species usually recover to pre-treatment numbers.

    Response: *Fish removal from lakes or streams with spring inflow requires additional effort to ensure that these areas do not provide a refuge for fish to avoid the rotenone. The Camas-Evangeline system has some spring areas, and we will be using approaches such as drip stations on the streams and placing slow-release rotenone mixtures (sometimes referred to as "dough balls," a mix of sand, rotenone, and unflavored gelatin) in the spring-influenced areas so that the rotenone is released more slowly and from as close to the spring source as possible to minimize the ability of fish to avoid it. We will also be walking these areas with backpack sprayers spraying directly into the spring areas. In the case of this project, there are no competitors that will rebound if rotenone does not remove all non-native Yellowstone cutthroat trout. At worst, any remaining Yellowstone cutthroat that survive will reproduce with the newly translocated genetically pure westslope cutthroat trout and result in very low level westslope-Yellowstone hybrids. We intend to "swamp" or overstock the lakes with pure westslope cutthroat trout to swamp out to the greatest extent possible any remaining Yellowstone genetics. While the intent is to avoid a second rotenone application if possible, the EA includes this as a possibility. The EA does not include more than two rotenone applications, because the need for multiple applications is not anticipated.*

20. ***Concern Statement:*** Rotenone can last for up to five months. Rotenone degrades more quickly in warmer water temperatures, but since Camas Lake and Lake Evangeline remain relatively cold even in summer, the rotenone will take longer to break down.

    Response: *Rotenone has a half-life in water of a few days to a few weeks, depending on a number of habitat variables; the EA describes the breakdown of rotenone in cold water environments on p. 5. While degradation is slower at colder temperatures and will remain lethal*

to fish for a longer period of time than in warmer waters, the longer half-life will help ensure complete eradication of non-native Yellowstone cutthroat trout.

21. ***Concern Statement***: Even extremely low levels of toxic chemicals can affect amphibian immune and endrocrine systems.

    Response: *The EA addressed impacts to amphibians from rotenone on p. 18.*

22. ***Concern Statement:*** How extensively has rotenone been used previously, and for how long has post-treatment monitoring occurred?

    Response: *While it is not possible to list all rotenone actions that have ever taken place, MFWP implemented 74 applications on 63 lakes in the Flathead Basin from 1948 to 2001. Recently, the agency completed a 15-year project to remove hybrid trout from headwater areas in the South Fork Flathead River drainage in Montana to protect genetically pure populations of westslope cutthroat trout. Rotenone was used in 21 lakes, followed by the reintroduction of genetically pure westslope cutthroat trout. Rotenone has also been used in other NPS units, including Rocky Mountain National Park, Northern Cascades National Park, Yosemite National Park, Yellowstone National Park, and Glen Canyon National Recreation Area. Post-treatment monitoring times vary, but will occur for 2-3 years for this project, consistent with the MFWP rotenone treatments in the South Fork of the Flathead River.*

23. ***Concern Statement:*** Using rotenone in the upper Camas drainage will set a precedent.

    Response: *Using rotenone to remove non-native fish in the park will not set a precedent, since rotenone has been used in many other NPS-managed waters across the US, including those listed in response to the previous comment. Rotenone was also used in Glacier in the 1960s in the Two Medicine River Valley to remove native suckers as part of a cooperative effort with the USFWS and Blackfeet Tribe to improve the trout fishing in Lower Two Medicine Lake.*

24. ***Concern Statement:*** The EA does not describe the toxicity and impacts to aquatic ecosystems of submerged, decomposing fish.

    Response: *The EA addresses effects of decomposing dead fish in Appendix D, p. D-3.*

25. ***Concern Statement:*** Are bull trout foraging in the stream above Arrow Lake? How will rotenone and potassium permanganate impact food sources for bull trout? What impacts will insect mortality have to species that prey on insects, such as westslope cutthroat trout, birds, bats, and others?

    Response: *As stated in the EA on pp. 5 and 17, bull trout have not been found in the treatment area (upstream of Arrow Lake). Because the rotenone will be neutralized and the potassium permanganate will dissipate before reaching bull trout and westslope cutthroat trout populations in Arrow Lake, food sources for bull trout and westslope cutthroat trout in those same waters will not be affected.*

    The EA addresses impacts of insect mortality to common loons and other water birds on pp. 32 and 33, and to state listed birds and bats in Appendix E. Text has been added to Appendix D,

Issues and Impact Topics Dismissed from Detailed Analysis, Wildlife (pp. D-4 and D-5), to describe similar impacts to wildlife from aquatic insect mortality.

26. ***Concern Statement:*** The last date Yellowstone cutthroat trout were stocked into Camas Lake and Lake Evangeline is not stated in the EA. If Yellowstone cutthroat trout have not been recently stocked, can their spawning areas be identified and targeted? Other methods should be used before using rotenone. Since Yellowstone cutthroat trout have been in Camas Lake and Lake Evangeline since the 1930s, why is there a sudden race against time (as stated in the EA)?

    Response: *Camas Lake and Lake Evangeline have not been stocked with Yellowstone cutthroat trout since 1935. In Appendix C, the EA considered but dismissed an alternative to remove non-native Yellowstone cutthroat trout with mechanical methods instead of rotenone. Such methods were utilized to remove lake trout from Swan Lake, but are not suitable for this project for the reasons explained. The need to preserve westslope cutthroat trout and bull trout populations in the park is explained in Chapter 1 of the EA.*

27. ***Concern Statement:*** Since Camas Lake and Lake Evangeline were historically fishless, stocking hatchery-reared fish into the lakes cannot be considered a restoration project.

    Response: *The objective of the project is to preserve native fish, not to restore the lakes to a historic condition.*

28. ***Concern Statement:*** Why will Rogers Lake be stocked with westslope cutthroat trout? Bull trout and non-native invasive lake trout are there.

    Response: *The preferred alternative/selected action does not include stocking Rogers Lake.*

29. ***Concern Statement:*** The park should do something instead about lake trout and rainbow trout in Rogers Lake and Howe Lake. Why doesn't the project area include Howe Lake?

    Response: *Rogers and Howe Lakes are not optimal sites for the park to invest resources into the removal of non-native fish because they are not protected against reinvasion by waterfalls or other barriers to fish migration. Howe Lake is also not part of the main Camas drainage, since Camas Creek is not its direct source, but is connected to the lower Camas drainage by a tributary of Camas Creek. Future projects may address these sites, in which case separate environmental analysis would be done at that time.*

30. ***Concern Statement:*** Why are native fish not also being translocated to Ruger Lake, Hidden Lake, and Lake Ellen Wilson? The park should remove invasive brook trout from Lake Ellen Wilson, which would provide a refuge for westslope cutthroat trout, and there would be no risk of mortality to native fish downstream.

    Response: *Native fish are not being translocated to Ruger Lake because the lake is currently fishless, and adding fish to the system would adversely impact plankton communities that are not adapted to the presence of fish. Hidden Lake and Lake Ellen Wilson are beyond the scope of this project.*

31. ***Concern Statement:*** Translocation will cause significant mortality of westslope cutthroat trout, bull trout and sculpin; electrofishing is likely to kill sculpins.

    Response: *The impacts to westslope cutthroat trout and bull trout from translocation are discussed on pp. 16-18 of the EA, and were determined to be insignificant. Bull trout translocation efforts at Grace Lake have not resulted in significant mortality. Mortality is unlikely to occur for this project due to the short helicopter travel time between the hatchery and the lakes (approximately 15-30 minutes) and mitigation measures listed on p. 9 of the EA. Modern electrofishing gear results in low fish injury rates because it uses a pulsed-DC current (rather than AC current, which was previously used). All staff involved in electrofishing receive training in minimizing injury/death to captured fish. We routinely sample sculpins with electrofishing gear without mortality. (However, translocating sculpin is no longer part of the preferred alternative or selected action; see Text Changes above).*

32. ***Concern Statement:*** The EA does not discuss the flight paths of the helicopters.

    Response: *Helicopter flight paths are determined shortly before flight time, since they depend on factors that cannot be known at this time, such as weather, other flights that may be underway, sensitive wildlife areas that haven't been identified yet (e.g. active eagle nests), and logistics. Flight paths will also determined by whether flights for this project can be combined with other administrative flights, which is not known at this time. Flight paths do not alter the conclusions reached in the analysis of impacts to park resources.*

33. ***Concern Statement:*** What process is in place if there are more than 50 administrative flights in the park per year? How many helicopter flights are there in the park each year, including those to rebuild the Sperry Chalet, and what are the impacts wildlife and visitors?

    Response: *The EA describes on p. 8 the park's process when more than 50 administrative flights are necessary in a given year. As stated, the number of helicopter flights in the park each year is less than 50, unless a given project requires additional flights. The EA includes the number of flights to rebuild the Sperry Chalet and the cumulative effects to resources carried forward for analysis on pp. 24, 30, 37, and 40.*

34. ***Concern Statement:*** Why is a minimum requirements analysis being prepared after a decision has been made, instead of being included in the EA for public comment?

    Response: *There are no requirements to append a minimum requirements analysis (MRA) to an EA (or EIS). In accordance with recent NPS guidance on documenting MRAs, an MRA may be referenced in the FONSI or ROD. This approach is appropriate if the park anticipates possible changes to the preferred alternative between the EA and FONSI, such as during public comment. The minimum requirement was considered during development of the alternatives, and an MRA was prepared and approved.*

35. ***Concern Statement:*** Using poison in wilderness is not consistent with the legal mandate in the Wilderness Act to preserve the untrammeled quality of wilderness character; using helicopters and motorboats and restocking historically fishless lakes are a violation of the Wilderness Act.

Response: *The defining qualities of wilderness as identified in Section 2(c) of the Wilderness Act include not only "untrammeled," but also "protected and managed so as to preserve its natural conditions." In the analysis of impacts to recommended wilderness, the EA articulates the trade-off between temporary adverse impacts to some qualities of wilderness character, including the untrammeled quality, for long-term benefits to the natural condition. Using helicopters and motorboats in wilderness is not a violation of the Wilderness Act if the use is "necessary to meet minimum requirements for the administration of the area" for the purposes of the Wilderness Act. The minimum requirements analysis (MRA) for this project determined that action is necessary for the preservation of the natural condition, and that helicopters, motorboats, and other motorized equipment are the minimum tool. Translocating westslope cutthroat trout and bull trout to Camas Lake and Lake Evangeline also does not violate the Wilderness Act because, as determined in the MRA, translocation is necessary for the preservation of the natural condition of the park's recommended wilderness.*

36. ***Concern Statement:*** What can be done to make sure no one stocks non-native fish into the lakes again?

    Response: *It would difficult to say that no one would ever do this, but given that it would be illegal and that the lakes are miles from the nearest road, the likelihood is low.*

37. ***Concern Statement:*** Is there funding to restock the lakes with native fish, amphibians, insects, and zooplankton?

    Response: *Funding exists to translocate westslope cutthroat trout and bull trout. Amphibians, insects, and zooplankton are expected to recover independently without translocation.*

38. ***Concern Statement:*** The EA does not address impacts to future fishing opportunities.

    Response: *The EA addresses impacts to angling on p. 39.*

39. ***Concern Statement:*** Could the park allow free fishing for two to three weeks before the lakes are poisoned? The lakes could be fished out before applying rotenone.

    Response: *Angling in Glacier National Park is already free. The EA dismissed an alternative to use recreational angling to remove non-native Yellowstone cutthroat trout from Camas Lake and Lake Evangeline (see Appendix C of the EA).*

40. ***Concern Statement:*** Would the dead fish be edible and could the park permit visitors to collect them to eat?

    Response: *While the park is not aware of any harm coming to people who have eaten rotenone-killed fish, it is not recommended. There would also be safety hazards associated with people packing out dead fish in an area with high grizzly bear densities.*

41. ***Concern Statement:*** The hatcheries that will be used for westslope cutthroat trout and bull trout propagation are not disclosed in the EA.

    Response*: At this time, the MFWP Sekokini Springs Hatchery outside the park will likely be used to propagate westslope cutthroat trout. Fertilized bull trout eggs will likely be taken to the*

Creston National Fish Hatchery, which has the experience, infrastructure, and cold water temperatures for successful bull trout propagation. The names of the hatcheries were not included in the EA because this level of detail is not necessary to evaluate the alternatives and impacts to park resources. NEPA reviews should focus on important environmental issues and avoid "amassing needless detail" (40 CFR Part 1500.1(b)).

42. ***Concern Statement:*** The EA does not explain how decisions will be made on whether to use streamside incubators, or what equipment, personnel, and monitoring would be required for incubators.

    Response: *Text has been added to p. 7 of the EA to further explain streamside incubators and clarify that they will not require the use of any motorized equipment. The EA acknowledges the impacts to wilderness character from incubators as installations on p. 25. Incubators will cause no other impacts to park resources. There are no plans to use incubators at this point, but the option is available should hatchery propagation be less than successful.*

43. ***Concern Statement:*** The EA does not include a range of alternatives, as required by the National Environmental Policy Act.

    Response: *The term "range of alternatives" refers to the set of all reasonable alternatives, including alternatives considered but eliminated from detailed analysis (DOI NEPA Regulations 46.420(c). The range of alternatives in the EA included an action and no-action alternative and three alternatives considered but dismissed from detailed analysis in Appendix C. Text has been added to Alternative C to include two additional alternatives that have been considered but dismissed as a result of public comment (see Text Changes).*

44. **Concern Statement:** It is disappointing that the National Park Service paused the larger fisheries management plan and EIS initiated in 2016, and that scoping was not reinitiated for this EA. Relying on scoping comments previously submitted for the EIS and putting the EA out for public review for only 20 days short-changes the public.

    Response: *The EIS was terminated in favor of focused and targeted fisheries management projects that can be analyzed in site-specific detail and for which funding is available. Based on the success of smaller scale actions, the park may or may not continue with a larger-scale plan at some point in the future. DOI NEPA regulations require that public notification and public involvement be conducted to the "extent practicable" when an EA is being prepared (46.305(a)). Therefore, public scoping for an EA is strongly encouraged but is not required. It is, however, NPS practice to conduct public scoping for projects requiring EAs. Scoping was not re-initiated for the current EA because the project consists of two of the same actions (remove non-native fish with rotenone, translocate native fish) that were proposed during scoping for the EIS. Comments received during scoping for the EIS that pertained to the use of rotenone and the translocation of native fish were considered during the development of the EA.*

45. ***Concern Statement:*** The 2016 scoping newsletter for the fisheries EIS did not justify the need to remove fish that currently inhabit project waters. Credible evidence needs to be provided to justify the removal of these populations.

    Response: *Chapter 1 of the EA describes the need for action and why the preservation of westslope cutthroat trout requires the removal of Yellowstone trout from Camas Lake and Lake*

Evangeline (pp. 1 and 2). The EA also describes threats to westslope cutthroat trout and bull trout on pp. 13-14.

46. **Concern Statement:** Concerns raised in 2016 during scoping for the fisheries EIS about toxicants and other issues were not considered during the development of this EA. Comments during scoping for the EIS requested that the EIS 1) describe other species that exist in the treatment areas, how they would be affected by rotenone, and what monitoring will occur to evaluate impacts; 2) analyze the effects of rotenone to downstream fish and non-target species; 3) describe how all the poisoned fish will be disposed of, and the effects to wildlife from feeding on poisoned fish carcasses; 4) analyze a meaningful range of alternatives to the rotenone treatment, including an end to all fish stocking, liberalized fishing regulations, netting, electrofishing, and targeting spawning areas; 5) include a comprehensive monitoring plan; 6) analyze the impacts to macroinvertebrates and amphibians; and 7) address the effects of antimycin, fintrol, diethyl phthalate, nonoxyl-9, acetone, rotenone, and potassium permanganate.

    Response: *Comments received during scoping for the EIS were considered during the development of the EA, and most were addressed within the document. The EA describes the fate of rotenone on p. 5, describes the decline in toxicity of potassium permanganate on p. 17, and evaluates the effects of rotenone and potassium permanganate in Chapter 3 and Appendices D and E (see response to Concern Statement 10). The EA addresses other species in the treatment area and how they will be affected by rotenone in Chapter 3. The EA explains on p. 6 that post-monitoring will follow established monitoring protocols in Montana's Piscicide Policy (see response to Concern Statement 4). Further details about monitoring were not described in the EA because this information is not necessary to evaluate the alternatives and impacts to park resources. The effects of rotenone to downstream fish and non-target species are addressed in the EA in Chapter 3, under Native Fish and Aquatic Species. The EA describes the disposal of poisoned fish on p. 5, effects to grizzly bears on p. 36, and effects to wildlife in Appendix D. The EA describes why alternatives to rotenone treatment were considered and dismissed in Appendix C; two additional alternatives were considered but dismissed as a result of public comment (see Text Changes). The EA did not discuss ending fish stocking because the National Park Service no longer stocks non-native fish in Glacier National Park. The EA analyzes the impacts to aquatic macroinvertebrates and amphibians on pp. 18-19.*

    Text changes have been made where necessary to include issues that were not adequately addressed. These text changes include effects of potassium permanganate to aquatic macroinvertebrates, zooplankton, common loons, other water birds, and grizzly bears in Chapter 3; effects of potassium permanganate to wetlands, floodplains, wildlife, and human health in Appendix D; and effects of aquatic insect mortality to wildlife in Appendix D. None of the text changes resulted in changes to conclusions reached in the analyses of impacts to park resources. This is because 1) the discussion in the EA on mortality to aquatic organisms considered the overall treatment, including the effects of potassium permanganate (even when the chemical was not specifically called out); 2) estimated aquatic macroinvertebrate and zooplankton population recovery timeframes are unchanged; 3) concentrations of potassium permanganate will be far below levels that are toxic to birds and mammals and will not affect wetland vegetation, soils, and hydrology; 4) the level of exposure necessary for effects to human health will not be possible at the concentrations that will be used; and 5) forage will not be measurably impacted for wildlife that prey on aquatic insects (see Text Changes, pp. 19-20, 32-36, D-2, D-3, D-5, and D-7). The EA does not address the effects of antimycin, fintrol, diethyl phthalate,

nonoxyl-9, and acetone because none of these chemicals will be used. Fintrol/antimycin is a now discontinued piscicide, and diethyl phthalate, nonoxyl-9 and acetone were inert ingredients in that product (D. Skaar, MFWP, personal communication).

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