

# **DRAFT**

# **ENVIRONMENTAL ASSESSMENT**

## **Westslope Cutthroat Trout Restoration in Elk Creek, Madison River Drainage**

**(FWP-SEA-FSH-R3-25-001)**

**February 6, 2025**



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## I. Compliance with the Montana Environmental Policy Act

Before a proposed *project* may be approved, an environmental review must be conducted to identify and consider the potential impacts of the proposed project on the human and physical environment affected by the project. The Montana Environmental Policy Act (MEPA) and its implementing rules and regulations require different levels of environmental review, depending on the proposed project, the significance of potential impacts, and the review timeline. § 75-1-201, Montana Code Annotated (“MCA”), and the Administrative Rules of Montana (“ARM”) 12.2.430, General Requirements of the Environmental Review Process.

FWP must prepare an EA when:

- It is considering a “state-proposed project,” which is defined in § 75-1-220(8)(a) as:
  - (i) a project, program, or activity initiated and directly undertaken by a state agency;
  - (ii) ... a project or activity supported through a contract, grant, subsidy, loan, or other form of funding assistance from a state agency, either singly or in combination with one or more other state agencies; or
  - (iii) ... a project or activity authorized by a state agency acting in a land management capacity for a lease, easement, license, or other authorization to act.
- It is not clear without the preparation of an EA whether the proposed project is a major one significantly affecting the quality of the human environment. ARM 12.2.430(3)(a));
- FWP has not otherwise implemented the interdisciplinary analysis and public review purposes listed in ARM 12.2.430(2) (a) and (d) through a similar planning and decision-making process (ARM 12.2.430(3)(b));
- Statutory requirements do not allow sufficient time for the FWP to prepare an EIS (ARM 12.2.430(3)(c));
- The project is not specifically excluded from MEPA review according to § 75-1-220(8)(b) or ARM 12.2.430(5); or
- As an alternative to preparing an EIS, prepare an EA whenever the project is one that might normally require an EIS, but effects which might otherwise be deemed significant appear to be mitigable below the level of significance through design, or enforceable controls or stipulations or both imposed by the agency or other government agencies. For an EA to suffice in this instance, the agency must determine that all the impacts of the proposed project have been accurately identified, that they will be mitigated below the level of significance, and that no significant impact is likely to occur. The agency may not consider compensation for purposes of determining that impacts have been mitigated below the level of significance (ARM 12.2.430(4)).

MEPA is procedural; its intent is to ensure that impacts to the environment associated with a proposed project are fully considered and the public is informed of potential impacts resulting from the project.

## II. Background and Description of Proposed Project

**Name of Project:** WCT Restoration in Elk Creek, Madison River Drainage

Montana Fish Wildlife and Parks (FWP) proposes to restore and maintain native Westslope Cutthroat Trout (WCT) in Elk Creek. Elk Creek is a tributary to the Madison River in southwest Montana. Historically, WCT, Arctic Grayling, and Mountain Whitefish were the only salmonid species in the Madison River. Within the proposed project area in Elk Creek, WCT was the only native salmonid present. Rocky Mountain sculpin *Cottus bondi* are also present in Elk Creek. Currently, WCT are isolated to a small headwater section of Elk Creek and most of the stream is occupied by Brook Trout which outcompete WCT for resources and will eventually extirpate them from the system. WCT in Elk Creek are currently distributed in 0.8 miles of stream with low genetic diversity. The likelihood of long-term persistence is low unless the population is expanded to at least five miles of stream.

Westslope Cutthroat Trout *Oncorhynchus clarkii lewisi* (WCT) were first described by the Lewis and Clark Expedition in 1805 near Great Falls, Montana, and are recognized as one of 14 interior subspecies of Cutthroat Trout. The historical range of WCT includes parts of Idaho, Montana, Washington, Wyoming, and the Canadian provinces of British Columbia and Alberta. In Montana, WCT occupy the Upper Missouri River and Saskatchewan River drainages east of the Continental Divide, and the Upper Columbia Basin drainages west of the Continental Divide. Although widespread, the distribution and abundance of WCT populations in Montana has declined significantly in the past century due to introductions of non-native fish, habitat degradation, and over-exploitation (Hanzel 1959, Liknes 1984, McIntyre and Rieman 1995, Shepard et al. 1997, Shepard et al. 2005). Reduced distribution of WCT is particularly evident in the Missouri River drainage where populations of non-hybridized WCT were estimated to persist in less than 5.5% of formerly occupied habitat, and most remaining populations were restricted to isolated headwater habitats (Shepard et al. 2003; Shepard et al. 2005). Many of the remaining populations are considered at risk due to their small population size, and most importantly, threats from non-native trout species such as competition, predation, and hybridization.

The declining status of WCT has led to its designation as a *Species of Special Concern* by the State of Montana, a *Sensitive Species* by the U.S. Forest Service (USFS), and a *Special Status Species* by the Bureau of Land Management (BLM). In 1997, a petition was submitted to the U.S. Fish and Wildlife Service (USFWS) to list WCT as “threatened” under the *Endangered Species Act* (ESA), 16 U.S.C. 1531, et seq. USFWS status reviews have found that WCT were “not warranted” for ESA listing (DOI 2003); however, this finding was in litigation until 2008 and additional efforts to list WCT under the ESA are possible.

To advance WCT conservation efforts in Montana, a Memorandum of Understanding or MOU and a Conservation Agreement for Westslope Cutthroat Trout in Montana was developed in 1999 by several federal and state resource agencies (BLM, FWP, USFS, and the National Park Service [NPS]), non-governmental conservation and industry organizations, tribes, resource users, and private landowners (FWP 1999: MOU). The MOU outlined goals and objectives for WCT conservation in Montana, which, if met, would significantly reduce the need for special status designations and listing of WCT under the ESA. The MOU was revised and endorsed by signatories in 2007 (FWP 2007). As described in the MOU, *the primary management goal for WCT in Montana is to ensure the long-term self-sustaining persistence of the subspecies in its historical range*. To achieve this goal, the Westslope Cutthroat Trout Conservation Strategy for the Missouri River Headwaters of Southwest Montana was developed (Jaeger et al. 2022). A conservation population is defined as viable assemblage of WCT which have most recently tested genetically as  $\geq 90\%$  WCT. Within the conservation population designation, a core population is defined as containing  $< 1\%$  introgression from nonnative species. This strategy describes specific, measurable objectives to ensure the long-term persistence of WCT in southwest Montana. The highest priority of the strategy is to secure existing, core populations of WCT in place to conserve the remaining genetic diversity left on the landscape. Secure WCT populations are isolated from non-native species (usually by a fish barrier) and occupy enough habitat to ensure long-term persistence. Hilderbrand and Kershner (2000) recommended a minimum WCT population size of 2,500 fish for long-term persistence ( $> 100$  years) and Harig and Fausch (2002) recommended a minimum of 5.6 square miles (minimum watershed size) of occupied habitat.

According to the Westslope Cutthroat Trout Conservation Strategy for the Missouri River Headwaters of Southwest Montana, the long-term goal for WCT conservation is to restore protected conservation populations of WCT to 20% of their historic tributary distribution east of the Continental Divide (Upper Missouri River Basin upstream from and including the Judith River; FWP 2023). Mainstem rivers, such as the Madison River, support important non-native recreational fisheries (i.e., Brown and Rainbow Trout) and are not part of this conservation goal. FWP recognizes the value of non-native trout fisheries and will continue to manage 80% of the tributary streams in the Missouri Headwaters for non-native fish such as Brook, Rainbow, and Brown Trout (FWP 2023). In the Madison River sub-basin, WCT historically occupied approximately 1,461 miles of tributary streams and rivers. Today there are a total of 22 remaining WCT populations in small headwater tributaries, which occupy

just over 200 miles of stream (14% of their historic range). Of these remaining 22 WCT populations, approximately 50% are at risk due to competition and hybridization with non-native fish. Data collected from streams in the Madison River sub-basin over the past 15 years indicate that many of the WCT populations in the drainage have dramatically declined or have been extirpated (Jaeger et al. 2021). Projects that protect at-risk populations of WCT, such as that proposed for Elk Creek, are necessary to ensure the continued survival of the species, conserve remaining genetic diversity, and meet statutory obligations to prevent listing under the ESA. This approach to WCT conservation is described in the Montana Statewide Fisheries Management Plan (FWP 2023).

Elk Creek is a tributary to the Madison River in the Madison Valley. The fishery of Elk Creek consists of Brook Trout, WCT, and Rocky Mountain sculpin. The introduction of Brook Trout has relegated the remaining WCT population to approximately 0.8 miles of the Elk Creek headwaters.



**Figure 1.** Elk Creek WCT would occupy 8 miles of Elk Creek following Brook Trout removal.

Montana Fish Wildlife and Parks (FWP) proposes to conserve native Westslope Cutthroat Trout (WCT) and expand their range in the Elk Creek drainage (Figure 2). Elk Creek is a tributary to the Madison River in southwest Montana. Historically, Westslope Cutthroat, Arctic Grayling, and Mountain Whitefish were the only salmonid species in the Madison Valley. However, the population of WCT in the Elk Creek Drainage has been diminished due to competition with non-native Brook Trout. Genetic testing has shown the population to be <1% introgressed with non-native species and is therefore considered a core population. However, the genetic variation of Elk Creek WCT has been reduced due to isolation and small population size, and the population must be expanded to increase its likelihood of long-term persistence.

Brook Trout upstream of the fish barrier would be removed using rotenone, a naturally derived chemical from plants that is highly effective at killing fish, with few impacts on non-target organisms. Rotenone acts by inhibiting oxygen transfer at the cellular level and is effective on fish at low concentrations because it is readily absorbed into the bloodstream through the gills. To prevent rotenone from affecting fish outside the treatment area, potassium permanganate ( $\text{KMnO}_4$ ) would be applied to treated water to neutralize rotenone at the fish barrier. Potassium permanganate is a strong oxidizer and quickly degrades rotenone (Engstrom-Heg 1971, Engstrom-Heg 1976; see Direct Impacts to Water Quality Section p 18 for more information). Consumption of rotenone-treated waters or dead fish by avian or terrestrial animals poses little threat as digestive processes readily degrade rotenone and it is not readily absorbed through the digestive tract. Therefore, terrestrial and avian animals can tolerate exposure to concentrations much higher than those used to kill fish. Rotenone does have temporary adverse impacts on gill-breathing aquatic invertebrates. However, studies have shown that at low concentrations and short exposure time, invertebrates typically recover within one year after waters are

treated with rotenone (Kjaerstad et al. 2022; Finlayson et al. 2010; Pham et.al 2017). Similarly, zooplankton communities may see temporary reductions but would be expected to rebound in less than one year (Kiser et al. 1963, Hughey 1975). Rotenone-treated waters pose minimal risk to terrestrial wildlife and humans; however, per rotenone label requirements, public access to the Elk Creek drainage will be prohibited during the 2–5-day treatment period.

Rotenone would be administered by trained FWP personnel following label requirements, FWP’s Standard Operating Procedures Manual, and the FWP Piscicide Policy. Formulated rotenone (5% active ingredient) would be applied at the label recommended rate for streams (1 part formulated rotenone to 1 million parts of stream water) with drip stations, which are containers that precisely administer diluted rotenone to the stream at a constant rate for 4 hours. In addition, backwaters, spring areas, and small tributaries would be treated with backpack sprayers according to label specifications. Treatment of Elk Creek would take 2-5 days and repeated in at least one consecutive year to ensure complete fish removal (Lampton et al. 2023).

The year following the second rotenone treatment, environmental DNA (eDNA) sampling would be used to verify if all fish in the stream were removed (Carim et al. 2020). eDNA is a method to detect the DNA shed by organisms into the environment by sequentially filtering stream water collected throughout the treatment area. If fish are present, their DNA is identified on the filter and an approximate location of the fish can be determined from where in the drainage the sample was collected. This technique has proven effective at detecting a single fish within an entire watershed (Carim et al. 2020). If eDNA sampling indicates that Brook Trout remain after two consecutive annual treatments, additional localized treatments would occur until the stream is confirmed to be fishless upstream of the barrier.

Following the removal of non-native fish, unaltered WCT from the isolated headwaters of Elk Creek would be allowed to occupy 8 miles of the stream. After treatment, WCT in Elk Creek would be monitored over the next 5-10 years to document their expansion in the drainage. Experience from other projects indicates that salvaged WCT released back to the stream following non-native trout removals will fill the available habitat within 3-6 years (Clancy et al 2019; Olsen 2020; Feuerstein 2022).

The primary benefit of this project is the long-term conservation of at-risk WCT populations in the Upper Missouri River. The top priority for WCT conservation in southwest Montana is to protect all remaining at-risk core populations of WCT (Jaeger et al. 2021). This project would expand the distribution of protected WCT by approximately eight miles and serve as an additional source of aboriginal Madison River WCT for future introductions. Collectively, conservation projects like the one proposed for Elk Creek are intended to preserve the existing genetic variation of extant WCT populations and expand the species’ current distribution to ensure it’s long-term, self-sustaining persistence while continuing to manage the vast majority of habitat (80%) for non-native fish like Brook Trout, Rainbow Trout, and Brown Trout (FWP 2023).



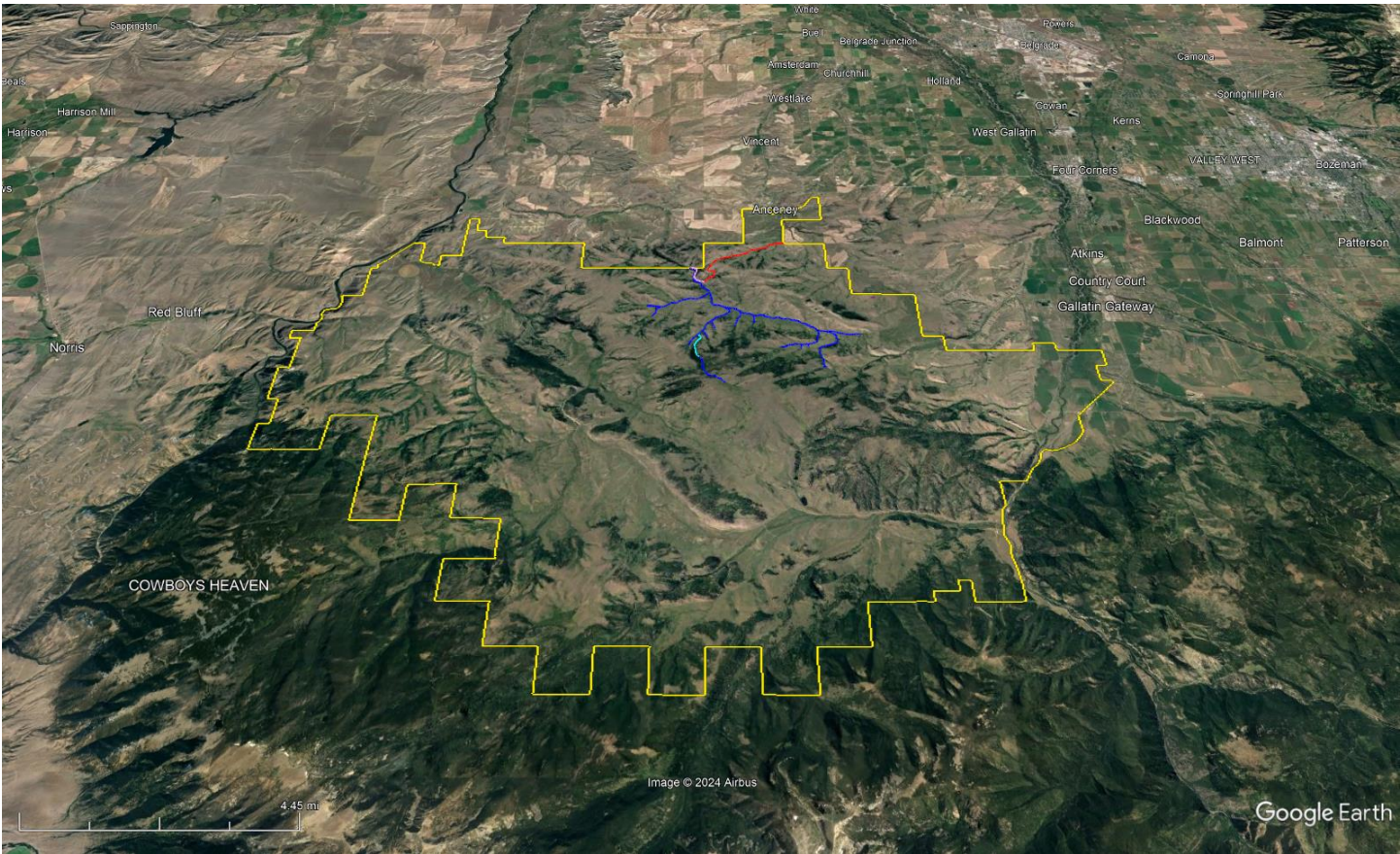


**Figure 3.** An Unnamed tributary to upper Elk Creek that would be treated with rotenone as part of the proposed project.

**Affected Area / Location of Proposed Project**

- Legal Description
  - Latitude/Longitude: 45.612696, -111.398444
  - Section, Township, and Range: T03S R03W Sec 6
  - Town/City, County, Montana: 10.34 miles southwest of Four Corners, Gallatin County Montana





**Figure 4.** Map of Elk Creek Project Area. Flying D Ranch boundary in yellow. Elk Creek proposed treatment area in dark blue.

### III. Purpose and Need

FWP is required to manage fish to prevent the need for listing as *Threatened* or *Endangered* under the federal ESA. Further, fish that are listed as *Species of Special Concern*, *Sensitive Species*, *Special Status Species*, or species that are candidates for listing under the ESA must be managed in a manner that assists in the maintenance and/or recovery of the species (§ 87-5-107, MCA). Montana state law provides FWP with the authority to implement fish management and restoration projects (MCA § 87-1-702; § 87-1-201[9][a]) and allows the use of chemicals to remove fish (ARM 12. 7. 1503[1][f][ii]). ESA listing of a species can have significant economic and political consequences. Restoration actions like the proposed project help Montana fulfill their obligation to conserve native species and avoid ESA listing.

The purpose of the proposed project is to protect and expand the native WCT population in Elk Creek, a tributary of Madison River, by removing non-native Brook Trout upstream of a constructed fish barrier.

Benefits of the proposed project include the following:

- Ensure continued survival of WCT in the Madison River drainage (i.e., Elk Creek)
- Conserve remaining genetic diversity in the affected WCT populations.
- Meet Montana’s statutory obligation to prevent the listing of WCT under the ESA.
- Satisfy the conservation objectives of the following guiding documents:
  - Memorandum of Understanding and Conservation Agreement for Westslope Cutthroat Trout in Montana (2007);
  - WCT Conservation Strategy for the Missouri Headwaters of Southwest Montana (2022);

Montana Statewide Fisheries Program and Guide (2023).	Yes*	No
Was a cost/benefit analysis prepared for the proposed project?	<input type="checkbox"/>	<input checked="" type="checkbox"/>



## IV. Other Agency Regulatory Responsibilities

FWP must list any federal, state, and/or local agencies that have overlapping or additional jurisdiction, or environmental review responsibility for the proposed project, as well as permits, licenses, and other required authorizations. ARM 12.2.432(3)(c).

A list of other required local, state, and federal approvals, such as permits, certificates, and/or licenses from affected agencies is included in **Table 1** below. **Table 1** provides a summary of state requirements but does not necessarily represent a complete and comprehensive list of all permits, certificates, or approvals needed. Rather, **Table 1** lists the primary state agencies with regulatory responsibilities, the applicable regulation(s), and the purpose of the regulation(s). Agency decision-making is governed by state and federal laws, including statutes, rules, and regulations, that form the legal basis for the conditions the proposed project must meet to obtain necessary permits, certificates, licenses, or other approvals. Further, these laws set forth the conditions under which each agency could deny the necessary approvals.

**Table 1: Federal, State, and/or Local Regulatory Responsibilities**

Agency	Type of Authorization (permit, license, stipulation, other)	Purpose
DEQ	Pesticide (Piscicide) Discharge Permit	Discharge of Pesticide to state waters
Department of Agriculture	Pesticide (Piscicide) Applicator License	Authorizes rotenone application

## V. List of Mitigations, Stipulations

Mitigations, stipulations, and other *enforceable* controls required by FWP, or another agency, may be relied upon to limit potential impacts associated with a proposed Project. The table below lists and evaluates enforceable conditions FWP may rely on to limit potential impacts associated with the proposed Project. ARM 12.2.432(3)(g).

**Table 2: Listing and Evaluation of Enforceable Mitigations Limiting Impacts**

<i>Are enforceable controls limiting potential impacts of the proposed action? If not, no further evaluation is needed.</i>		Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<i>If yes, are these controls being relied upon to limit impacts below the level of significance? If yes, list the enforceable control(s) below.</i>		Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Enforceable Control	Responsible Agency	Authority (Rule, Permit, Stipulation, Other)	Effect of Enforceable Control on Proposed Project
Piscicide Policy: Application rate and neutralization of Rotenone	FWP	Internal Policy	Regulates pre-project planning and neutralization of rotenone to prevent rotenone effects outside the project area.
CFT Legumine Label	MT Dept of Agriculture, US Environmental Protection Agency	The Montana Pesticides Act (MPA), Title 80, Chapter 8, Sections 80-8-101 through 80-8-405, MCA,	Regulates safety procedures, application rates, and neutralization of rotenone application.

		Federal Insecticide, Fungicide and Rodenticide Act	
Native and sensitive species management	FWP	Section 87-1-201(9)(a), M.C.A.	FWP is required by law to implement programs that manage sensitive fish species in a manner that assists in the maintenance or recovery of those species, and that prevents the need to list the species under § 87-5-107, MCA, or the federal ESA.
Westslope Cutthroat conservation	FWP, DNRC DEQ, MT Stockgrowers, MT Farm Bureau Federation, USFS, BLM, USFWS, US Natural Resource and Conservation Service, and 10 other signatories	Memorandum of Understanding	FWP is a signatory to the Memorandum of Understanding and Conservation Agreement for Westslope Cutthroat Trout in Montana (FWP 1999, 2007) which states: “The management goal for WCT in Montana is to ensure the long-term, self-sustaining persistence of the subspecies within each of the five major river drainages they historically inhabited in Montana, and to maintain genetic diversity and life history strategies represented by the remaining local populations.”
Westslope Cutthroat conservation goal 20% of historically occupied habitat	FWP	State-Wide Fisheries Management Plan	Specifies a management goal of restoring Westslope Cutthroat Trout in the Upper Missouri River drainage to 20% of their historically occupied habitat. Specifies a management goal to expand the distribution of and preserve existing genetic diversity in secured locations.
Missouri Headwaters Westslope Cutthroat Conservation Strategy	FWP	Conservation Strategy	Defines conservation of WCT by securing existing populations in natal habitat as highest conservation priority.
Pesticide Discharge Permit	DEQ	Permit	Regulates pesticide application to the waters of Montana and requires annual reporting.
Pesticide Applicator License	Department of Agriculture	Permit	Certifies and licenses annually all pesticide applicators, enforces the label requirements, and mandates pesticide use documentation.

## VI. Alternatives Considered

### Alternative 1: No action

Under the “No Action” alternative, the proposed project would not occur. Therefore, no additional impacts to the physical environment or human population in the analysis area would occur because of the proposed project.

The no action alternative would result in continued status quo fisheries management and WCT would not be protected in Elk Creek. FWP would pursue a similar project in a different drainage to protect the remaining three at-risk core ( $\geq 99\%$ ) populations of WCT in the Madison sub-basin to prevent them from being lost to hybridization or competition with non-native species.

Loss of additional core WCT populations would adversely impact the State’s obligation to conserve native fish and may contribute to the potential future listing of the affected species under the ESA. Although there is limited angling that

occurs in Elk Creek, the no action alternative would maintain the existing fishery and provide uninterrupted opportunities for angling. The no action alternative would also avoid the short-term adverse impacts of rotenone on non-target aquatic invertebrates.

The no action alternative would also eliminate Elk Creek as a possible source for future introductions or genetic rescue.

Alternative 2: Proposed Project

FWP proposes to restore and protect WCT in Elk Creek by removing non-native trout upstream of the fish barrier using the piscicide rotenone. FWP would salvage non-hybridized WCT from the isolated headwaters of Elk Creek and reintroduce WCT from other core populations to bolster genetic diversity. Reference Section IX. A and B below for an analysis of potential impacts to the human environment associated with Alternative 2, the proposed project.

	Yes*	No
Were any additional alternatives considered and dismissed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>

\* If yes, a list and description of the other alternatives considered, but not carried forward for detailed review is included below

**Other Alternatives Not Carried Forward for Detailed Analysis**

Alternative 3: Mechanically remove Brook Trout from Elk Creek.

Alternative 3 would attempt to protect native WCT in Elk Creek by removing Brook Trout with electrofishing rather than rotenone. Multiple-pass electrofishing has been used to eradicate non-native trout from several small streams in northcentral and southwest Montana. Electrofishing can be an effective means of capturing fish in streams; however, successful eradication of fish using electrofishing is limited to small, simple systems (i.e., <3 miles length, <10 feet wide), with little to no instream woody debris; Thompson and Rahel 1996, Shepard et al. 2014). In Alberta, a combination of angling and electrofishing was used over 18 years to remove Brook Trout and restore native trout, however, no positive response by the native species was observed (Sinnatamby et al. 2023).

Generally, electrofishing is 50-70% efficient at capturing fish depending on habitat type and fish size distribution. Furthermore, electrofishing removal is labor intensive, inefficient at capturing juvenile fish, and requires multiple years to allow juvenile fish to grow to the size where they can be readily captured. The project reaches where electrofishing removals have been successful were generally less than 3 miles in length and required up to 25 electrofishing removal passes over several years to eradicate the target species (Shepard et al. 2014). Each electrofishing pass would require a crew of 3 to 9 people and would likely have to occur for at least 10 years. Attempts at mechanical removals in the Upper Missouri River basin required several years of suppression and significantly reduced non-native trout densities, however, they were unsuccessful in eradicating them and ultimately the non-native trout populations rebounded, and chemical treatment was required for non-native trout removal (e.g., Dutchman Creek, McVey Creek). Removing Brook Trout from Elk Creek with electrofishing would likely be unsuccessful because of the habitat complexity and stream length currently occupied by fish (8 miles total). A mechanical removal effort in Elk Creek would be impractical and unlikely to achieve 100% removal of non-native trout given the length of the stream and complexity of the habitat present. As such, the mechanical removal alternative is not reasonable for the proposed action. Therefore, Alternative 3, Mechanically Remove Hybrid trout from Elk Creek, was eliminated from further, detailed consideration.

**VII. Terms Used to Describe Potential Impacts on the Physical Environment and Human Population**

The impacts analysis identifies and evaluates **direct, secondary, and cumulative impacts**.

- **Direct impacts** are those that occur at the same time and place as the action that triggers the effect.

- **Secondary impacts** “are further impacts to the human environment that may be stimulated or induced by or otherwise result from a direct impact of the action.” ARM 12.2.429(18).
- **Cumulative impacts** “means the collective impacts on the human environment of the proposed action when considered in conjunction with other past and present actions related to the proposed action by location or generic type. Related future actions must also be considered when these actions are under concurrent consideration by any state agency through pre-impact statement studies, separate impact statement evaluation, or permit processing procedures.” ARM 12.2.429(7).

Where impacts are expected to occur, the impact analysis estimates the **extent, duration, frequency, and severity** of the impact. The duration of an impact is quantified as follows:

- **Short-Term:** impacts that would not last longer than the proposed project.
- **Long-Term:** impacts that would remain or occur following the proposed project.

The severity of an impact is measured using the following:

- **No Impact:** there would be no change from current conditions.
- **Negligible:** an adverse or beneficial effect would occur but would be at the lowest levels of detection.
- **Minor:** the effect would be noticeable but would be relatively small and would not affect the function or integrity of the resource.
- **Moderate:** the effect would be easily identifiable and would change the function or integrity of the resource.
- **Major:** the effect would irretrievably alter the resource.

Some impacts may require mitigation. As defined in ARM 12.2.429, mitigation means:

- Avoiding an impact by not taking a certain action or parts of a project;
- Minimizing impacts by limiting the degree or magnitude of a project and its implementation;
- Rectifying an impact by repairing, rehabilitating, or restoring the affected environment; or
- Reducing or eliminating an impact over time by preservation and maintenance operations during the life of a project or the time period thereafter that an impact continues.

FWP may, as an alternative to preparing an EIS, prepare an EA whenever the action is one that might normally require an EIS, but effects that might otherwise be deemed significant appear to be mitigable below the level of significance through design, or enforceable controls or stipulations, or both, imposed by the agency or other government agencies. For an EA to suffice in this instance, the agency must determine that all the impacts of the proposed action have been accurately identified, that they will be mitigated below the level of significance, and that no significant impact is likely to occur. The agency may not consider compensation for purposes of determining that impacts have been mitigated below the level of significance. ARM 12.2.430(4).

A list of any mitigation strategies including, but not limited to, design, enforceable controls or stipulations, or both, as applicable to the proposed project is included in **Section VI** above.



FWP must analyze impacts to the physical and human environment for each alternative considered. The proposed project considered the following alternatives:

- Alternative 1: No Action
- Alternative 2: Proposed Project

## VIII. Alternative 1: No Action. Evaluation and Summary of Potential Impacts on the Physical Environment and Human Population

Under the “no action” alternative, the proposed project would not occur. Therefore, no additional impacts to the physical or human environment in the analysis area would occur. The no action alternative forms the baseline from which the potential impacts of the proposed Project can be measured.

## IX. Alternative 2: Proposed Action. Evaluation and Summary of Potential Impacts on the Physical Environment and Human Population

### A. Evaluation and Summary of Potential Impacts on the Physical Environment

#### 1. Terrestrial, Avian, and Aquatic Life and Habitats

##### **Existing Environment/No Action Alternative**

Wildlife species found in the Madison Valley include small and large mammals, birds, reptiles, amphibians, and fish. The Madison Valley provides habitat for big game species (Elk, Antelope, Mule Deer, White-Tailed Deer, Moose, Black Bear, Mountain Lion), furbearers (Beaver, Muskrat, Mink, Marten, Bobcat), one omnivore listed as *threatened* under the ESA (Grizzly Bear), two furbearers listed as *threatened* under the ESA (North American Wolverine, Canada Lynx), one ESA-delisted carnivore (Gray Wolf), two species of fish listed by the state of Montana as species of concern (Westslope Cutthroat Trout, Arctic Grayling), and one ESA-delisted bird (Bald Eagle). The Madison Valley also provides habitat for upland game bird species’ (Ruffed Grouse, Franklin’s Grouse, Blue Grouse) and an upland game bird *species of concern* (Greater Sage Grouse). A more detailed impacts analysis for *species of concern*, *species of special status*, and *ESA-threatened* species is included within this impacts analysis under the section titled *Unique, Fragile, or Limited Environmental Resources*.

The terrestrial and aquatic habitat and species present in the Elk Creek drainage are typical of those found throughout Madison River sub-basin. The drainage is a mix of lodgepole pine, Engelmann spruce, and willows. As the creek enters the valley on the lower end, willows and grasses are the primary riparian feature. The Elk Creek drainage is classified as, 19% Sagebrush Steppe, 35% Wetland/Riparian, 30% Forest, 15% Grassland, and 1% Human Land-Use.

The aquatic habitat consists primarily of a moderate gradient Rosgen “B” type stream channel dominated by gravel and sand substrates. The fishery in Elk Creek is dominated by Brook Trout with Rocky Mountain Sculpin also being present in the middle and lower reaches of the stream.

##### **Direct Impacts**

No significant adverse direct impacts would be expected because of the proposed project. However, the proposed project may result in some adverse impacts to terrestrial, avian, and aquatic life and habitats.

### Terrestrial Habitats:

Some direct, temporary, adverse impacts to terrestrial habitats would be expected and limited to trampling of vegetation by project personnel walking up and down the banks of Elk Creek and its tributaries during project implementation. The treatment of Elk Creek with rotenone would be performed by as many as 15 FWP, BLM, USFS and other partner agency personnel. Any trampling impacts on vegetation are anticipated to be unnoticeable within one growing season. Further, only a limited number of personnel would work on a particular section of stream each year (2-3) so potential impacts would be mitigated by a periodic lack of activity. These impacts would be further minimized by the use of existing trails and road systems to the extent practicable. Any direct impacts to terrestrial habitat would be short-term, negligible, and mitigated by personnel working primarily along the margins of the stream and by the use of existing roads and trails, as available.

### Terrestrial and Avian Life (Generally):

Terrestrial and avian life may be temporarily displaced because of the presence of personnel working in the area during the application of rotenone to Elk Creek and its tributaries. However, the entire treatment is expected to last less than 5 days per year over 2 years. Project personnel will only be present in each affected reach of Elk Creek for a single day (less than 8 hr) so displaced terrestrial life would be expected to quickly return to the area. Any adverse direct impacts to terrestrial and avian life would be short-term, minor, and mitigated by personnel working primarily along the margins of the stream.

### Mammals:

Mammals are not affected by rotenone at concentrations used to kill fish. Unlike fish, exposed to rotenone through their gills, terrestrial wildlife exposure occurs only through the consumption of treated water and/or fish killed by rotenone. Ingested rotenone is rapidly broken down by enzymatic action in the stomach and intestines (AFS 2002). Therefore, the low concentrations of rotenone used to kill fish pose no risk to terrestrial wildlife. Studies of risk for terrestrial animals found that a 22-pound dog would have to drink 7,915 gallons of treated lake water within 24 hours, or eat 660,000 pounds of rotenone-killed fish, to receive a lethal dose (CDFG 1994). The State of Washington reported that a half-pound mammal would need to consume 12.5 mg of pure rotenone to receive a lethal dose (Bradbury 1986). Considering the only conceivable way terrestrial wildlife or domestic animals could consume rotenone under field conditions is by drinking treated water or consuming dead fish, a half-pound animal, such as a squirrel, would need to drink 16 gallons of water treated at 1 ppm rotenone in 24 hours to receive a lethal dose.

The EPA (2007) made the following conclusions for small mammals and large mammals:

When estimating daily food intake, an intermediate-sized 350 g mammal will consume about 18.8 g of food. Using data previously cited from the Common Carp with a body weight of 88 g, a small mammal would only consume 21% (18.8 g/88 g) of the total carp body mass. According to the data for Common Carp, total body residues of rotenone in carp amounted to 1.08 µg/g. A 350-g mammal consuming 18.8 grams represents an equivalent dose of 20.3 µg of rotenone; this value is well below the median lethal dose of rotenone (13,800 µg) for similarly sized mammals. When assessing a large mammal, 1000 g is considered to be the default body weight. A 1,000 g mammal will consume about 34 g of food. If the animal fed exclusively on carp killed by rotenone, the equivalent dose would be  $34 \text{ g} \times 1.08 \text{ µg/g}$  or 37 µg of rotenone. This value is below the estimated median lethal equivalent concentration adjusted for body weight (30,400 µg). Therefore, it is extremely unlikely that scavenging or piscivorous mammals would

consume enough dead or dying fish to result in observable acute toxicity. Any direct impacts to mammals would be short-term and negligible.

#### Birds:

Similar findings showed that birds, or avian life, required levels of rotenone at least 1,000 to 10,000 times greater than is required for lethality in fish (Skaar 2001). Cutkomp (1943) reported that chickens, pheasants, and members of lower orders of Galliformes were quite resistant to rotenone, and four-day-old chicks were more resistant than adults. Ware (2002) reports that swine are uniquely sensitive to rotenone and it is slightly toxic to wildfowl, but to kill Japanese Quail required 4,500 to 7,000 times more than is used to kill fish.

The EPA (2007) made the following conclusion for birds (avian life);

Since rotenone is applied directly to water, there is little likelihood that terrestrial forage items for birds will contain rotenone residues from this use. While some piscivorous birds may feed opportunistically on dead or dying fish located on the surface of treated waters, dead fish degrade quickly, rendering them less available for consumption. In addition, many of the dead fish will sink and not be available for consumption by birds. However, whole-body residues in fish killed with rotenone ranged from 0.22 µg/g in Yellow Perch (*Perca flavescens*) to 1.08 µg/g in Common Carp (*Cyprinus carpio*; Jarvinen and Ankley 1998). For a 68 g Yellow Perch and an 88 g Carp, this represents totals of 15 µg and 95 µg rotenone per fish, respectively. Based on the avian subacute dietary LC50 of 4,110 mg/kg, a 1,000-g bird would have to consume 274,000 perch or 43,000 small carp. Thus, it is extremely unlikely that piscivorous birds will consume enough fish to result in a lethal dose. Any direct impacts to avian life would be short-term and negligible.

#### Fish:

The purpose of the project is to remove Brook Trout from Elk Creek upstream of the fish barrier to restore native WCT. Adverse project impacts would be minor because Brook Trout are common throughout the Madison River drainage and the established fisheries management goal is to manage 80% of the available habitat in the Upper Missouri River Basin for non-native trout (Statewide Fisheries Management Plan, FWP 2023). Further, the only detectable angling pressure in the Elk Creek drainage is near the confluence with the Madison River and will not be affected. The impacts on WCT will be long-term and beneficial (Statewide Fisheries Management Plan, FWP 2023).

Rocky Mountain Sculpin are also present in the Elk Creek drainage. Sculpin are susceptible to rotenone but have a higher tolerance than trout species. Recent studies suggest that sculpin generally survive rotenone treatments at the concentrations used to remove trout. Because sculpin have a higher tolerance for rotenone than salmonids, it is anticipated that many sculpin will survive the rotenone treatments. However, if subsequent surveys in Elk Creek fail to detect sculpin, fish will be captured below the fish barrier or in an adjacent stream and reintroduced into the project area. Any direct impacts to Rocky Mountain Sculpin are anticipated to be short-term, minor, and mitigated to avoid any long-term impacts.

#### Aquatic Invertebrates:

Numerous studies indicate that rotenone can have acute and sometimes substantial impacts on aquatic invertebrates, but studies also show these impacts are short-term and that invertebrate communities generally rebound to pre-project abundance and diversity within 1 year. One study reported that no long-term significant reduction in aquatic invertebrates was observed due to the effects of rotenone,

which was applied at levels twice as high as the levels proposed for this project (Houf and Campbell 1977). Some have reported delayed recovery of taxa richness (number of taxa present) following rotenone treatments, but many of these treatments were at higher concentrations than proposed in this treatment (Mangum and Madrigal 1999). Finlayson et al. (2010) summarized high concentrations of rotenone (>100 ppb) and treatments exceeding 8 hours, typically resulted in severe impacts on invertebrate richness and abundance. Conversely, lower rotenone concentrations (<50 ppb as is proposed in Elk Creek) and treatments less than 8 hours (4 hours proposed in Elk Creek), resulted in less impact on invertebrate assemblages. Chandler and Marking (1982) found that clams and snails were between 50 and 150 times more tolerant than fish to Noxfish (5% rotenone formulation). In all cases, the reduction of aquatic invertebrates was temporary, and most treatments used a higher concentration of rotenone than proposed for this project (Schnick 1974). In a study on the relative tolerance of different aquatic invertebrates to rotenone, Engstrom-Heg et al. (1978) reported that the long-term impacts of rotenone are mitigated because those insects that were most sensitive to rotenone also tended to have the highest rate of recolonization.

Temporary changes in aquatic invertebrate communities due to a rotenone treatment would be similar to what is observed after natural (e.g., fire) and anthropogenic (livestock grazing) disturbances (Wohl and Carline 1996; Mihuc and Minshall 1995; Minshall 2003), though the physical impacts and resulting modifications of invertebrate assemblages after these types of disturbances can last for a much longer period than a piscicide treatment. Because of their short life cycles (Matthaei et al. 1996), good dispersal ability (Pennack 1989), and generally high reproductive potential (Matthaei et al. 1996), aquatic invertebrates are capable of rapid recovery from disturbance (Boulton et al. 1992; Matthaei et al. 1996). In addition, aerially dispersing invertebrates from downstream areas (i.e., mayflies, caddis, stoneflies) would readily recolonize the project area. Therefore, the possibility of eliminating a rare or endangered species of aquatic invertebrates with rotenone is unlikely. Further, the Montana Natural Heritage Program lists no aquatic invertebrate species of concern or potential species of concern in Elk Creek. Based on these studies, FWP expects that the aquatic invertebrate species composition and abundance will return to pre-treatment condition within one to two years after treatment. Therefore, any adverse impacts to aquatic invertebrate communities would be short-term and minor, as aquatic invertebrates quickly repopulate vacant streams because of their ability to disperse terrestrially as adults.

#### Amphibians and Reptiles:

Amphibians potentially found within the proposed treatment area include Western Tiger Salamanders (*Ambystoma mavortium*), Columbia Spotted Frogs (*Rana luteiventris*), Western Toads (*Bufo boreas*). Rotenone can be toxic to gill-breathing larval amphibians, although air-breathing adults are less sensitive. Chandler and Marking (1982) found that Southern Leopard Frog tadpoles were between 3 and 10 times more tolerant than fish to Noxfish (5% rotenone formulation). Grisak et al. (2007) conducted laboratory studies on Long-toed Salamanders, Rocky Mountain Tailed Frogs (*Ascaphus truei*), and Columbia Spotted Frogs and concluded that the adults of these species would not suffer an acute response to rotenone at trout killing concentrations (0.5-1 ppm) but the larvae would likely be affected. These authors recommended implementing rotenone treatments at times when the larvae are not present, such as the fall, to reduce the chance of exposure to rotenone treated water and potential impacts to larval amphibians.

Among the amphibians present, Western Toads have been documented in Elk Creek. The Western Toad is listed by the state of Montana as a *species of concern*. A more detailed analysis of potential project impacts to the Western Toad is included in this impacts analysis under the section titled *Unique, Endangered, Fragile, or Limited Environmental Resources*. Any reduction in amphibian abundance would



be expected to be short-term due to the low sensitivity of adults to rotenone, and because reproductive habitats will not be targeted for treatment as they generally lack fish. Toads generally seek out shallow lentic areas for reproduction, which are not present in the treatment area. On a recent rotenone treatment in Selway Creek (Beaverhead River drainage), Columbia Spotted Frogs were observed to be abundant in Selway Lake in the spring following a rotenone treatment the previous summer. Any direct impacts to amphibians would be short-term and minor to moderate.

Reptiles potentially found within the proposed treatment area include Western Terrestrial Garter (*Thamnophis elegans*), Common garter (*T. sirtalis*), and Rubber Boa (*Charina bottae*) snakes. Reptiles are highly resistant to rotenone at fish-killing concentrations and would not be directly.

## **Secondary Impacts**

No significant adverse secondary impacts would be expected because of the proposed project. Following treatment with rotenone, short-term and minor adverse secondary impacts to mammals, birds, amphibians, and reptiles would be expected due to the temporary and minor loss or reduction of food sources, such as fish and aquatic invertebrates in Elk Creek. Mink, Blue Heron, Kingfisher, and other potential piscivorous mammals and birds may be displaced for up to 2 years while fish are absent from the affected 8-mile section of Elk Creek. Any adverse impacts would be minor because no mammal species present in the Elk Creek drainage are fish obligates and other potential food sources for these organisms will not be affected by the proposed action. Further, piscivorous avian species are mobile and, as such, would have access to other nearby waters where fish are more abundant, such as adjacent tributaries and the Madison River. Therefore, any impacts to these species would be limited to temporary displacement until WCT repopulates the stream.

Some snakes are also known to consume fish from streams; therefore, snakes may realize a temporary and minor reduction in available food because of the proposed piscicide treatment. However, none of the reptiles known to be present in the Elk Creek drainage are fish obligates. Further, WCT would be available to snakes within a few years after treatment. Therefore, any adverse secondary impacts would be short-term and minor.

A reduced abundance of aquatic invertebrates may temporally impact adult amphibians and potentially some bird species. Bird species such as the American Dipper which feeds primarily on aquatic invertebrates may be temporarily displaced to nearby streams where invertebrates would not be affected. However, the aquatic invertebrate community is expected to recover rapidly and most amphibians and birds are not aquatic invertebrate obligates. Therefore, any adverse secondary impacts would be short-term and minor.

## **Cumulative Impacts**

No significant adverse cumulative impacts would be expected due to the proposed project. Cumulative impacts from the proposed project would include substantial benefits for WCT conservation. According to the Statewide Fisheries Management Plan (FWP 2023), the WCT conservation goal for the Upper Missouri River basin is to restore secured WCT populations to 20% of their historical range. In the Madison River that would equate to 292 miles of stream. Additionally, the highest priority of the Westslope Cutthroat Trout Conservation Strategy for the Missouri River Headwaters of Southwest Montana (Jaeger et al. 2022) is to protect existing non-hybridized populations (>99%) of WCT to

conserve the remaining genetic diversity left on the landscape. Vacant habitat created in Elk Creek will be utilized to preserve up to three populations of non-hybridized WCT from neighboring streams. When combined with similar projects performed in the Madison drainage and its existing WCT populations, once the Elk Creek project is complete, WCT will occupy 213 miles of stream (73%) of the native WCT restoration goal (292 miles). Further, the proposed project would mitigate against the potential for future federal ESA-listing of WCT, as required by § 87-5-107, MCA.

FWP is unaware of any other past or present related state projects that would impact terrestrial, avian, and aquatic life and habitats in the Elk Creek drainage. FWP has not previously treated the affected section of Elk Creek with rotenone.

## **2. Water Quality, Quantity, and Distribution**

### **Existing Environment/No Action Alternative**

Elk Creek is a relatively pristine basin with no known water quality impairments. Bison grazing does occur in the drainage, but significant impacts from this activity have not been observed. Rotenone will be deactivated using potassium permanganate below the project area on Elk Creek.

### **Direct Impacts**

No significant adverse direct impacts would be expected due to the proposed project. The proposed action would intentionally introduce the pesticide rotenone to surface water to completely remove non-native Brook Trout from the affected section of Elk Creek. CFT Legumine (5% rotenone) is an EPA registered pesticide and is deemed safe to use for the removal of unwanted fish when handled and applied according to the product label. The concentration of rotenone proposed for use is 1 part formulation to one million parts of water (1 ppm).

Once applied to water, rotenone is susceptible to rapid natural breakdown through a variety of mechanisms. This first means of natural detoxification is influenced by water chemistry, water temperature, exposure to organic substances, exposure to air, and sunlight intensity (Ware 2002; ODFW 2002; Loeb and Engstrom-Heg 1970; Engstrom-Heg 1972; Gilderhus et al. 1986). Rotenone persistence studies by Gilderhus et al. (1986) and Dawson et al. (1991) found that the half-life of rotenone (amount of time it takes for 50% of the compound to naturally decompose) once applied to water was 3.5 to 5.2 days. The second method of natural detoxification is dilution, which occurs when untreated ground or surface water flows into a lake or stream. The combination of natural breakdown and dilution in streams usually results in complete detoxification of rotenone within 24-48 hours.

In addition to natural methods of breakdown, rotenone is rapidly neutralized through the application of the oxidizing agent, potassium permanganate (KMnO<sub>4</sub>), which is the only chemical allowed by law for deactivating rotenone. Potassium permanganate is applied to treated waters in a granular form or as a 2.5% solution (1-pound KMnO<sub>4</sub> to 5 gallons (25 g/L) water). This dry crystalline substance is mixed with stream or lake water to produce a concentration of liquid sufficient to detoxify the rotenone. Potassium permanganate is a respiratory and eye irritant and creates persistent stains on both skin and clothes. It can be toxic to fish, however, if the concentration is in balance with rotenone concentrations, then levels of KMnO<sub>4</sub> are minimized through the oxidation of organic components and rotenone. Detoxification is accomplished after 15-30 minutes of contact time between the two compounds. As rotenone-treated water leaves the project area (i.e., fish barrier), KMnO<sub>4</sub> is applied to the stream at a rate such that the residual value measured 30 minutes below the KMnO<sub>4</sub> application site remains at 0.5-

1.0 ppm. KMnO<sub>4</sub> application continues until sentinel fish at the barrier survive for four hours and KMnO<sub>4</sub> is no longer needed.

Detoxification would be used in Elk Creek at the fish barrier to prevent treated waters from traveling downstream and affecting fish outside of the proposed treatment area. Rotenone neutralization would commence according to FWP Rotenone Deactivation Procedures found in the FWP Piscicide Policy which states that detoxification with KMnO<sub>4</sub> will begin no less than 2 hours before the theoretical arrival time of treated waters at the detoxification station. Therefore, KMnO<sub>4</sub> application would commence no less than 2 hours before the arrival of rotenone-treated waters at the fish barrier and would continue until all treated waters have passed over the fish barrier and sentinel fish placed in the stream below the barrier survive for four hours with no signs of stress.

The efficacy of rotenone detoxification in the stream would be assessed by measuring residual KMnO<sub>4</sub> levels with a handheld meter and monitoring the health of sentinel fish at 30 minutes of water travel time below the fish barrier. A minimum of 0.5-1.0 ppm KMnO<sub>4</sub> residual at 30 minutes is required to fully neutralize rotenone. After the rotenone is applied, FWP would expect to apply KMnO<sub>4</sub> from the treatment station for approximately 24-48 hours or until the rotenone has passed through the treatment area. Residual values of KMnO<sub>4</sub> and rotenone in the stream will be undetectable at that point. Any adverse direct impacts would be short-term, mitigated through the use of KMnO<sub>4</sub>, and minor.

### **Secondary Impacts**

No significant adverse secondary impacts would be expected because of the proposed project. Dead fish (Brook Trout and Rocky Mountain Sculpin) would result from the proposed project. As dead fish decay they may cause secondary impacts to water quality. Bradbury (1986) reported that 9 of 11 lakes in Washington treated with rotenone experienced an algae bloom shortly after treatment. This was attributed to increased phosphorus input from decaying fish. Bradbury (1986) further notes that approximately 70% of the phosphorus content of the fish stock would be released into the water through bacterial decay. This action may be beneficial because it would stimulate algae and invertebrate production. Any impacts to water quality resulting from decaying fish would be short-term and minor.

### **Cumulative Impacts**

No significant adverse cumulative impacts would be expected because of the proposed project. FWP is unaware of any other past, present, or future related state projects that would impact water quality, quantity, and distribution in the Elk Creek drainage.

## **3. Geology**

### **Existing Environment/No Action Alternative**

The Madison Range is located near the southwestern extent of the Yellowstone Volcanic Plateau in the Sevier-Laramide Thrust Belt Overlap zone. The area contains extensive exposure of Quaternary igneous rock (Sonderegger 1981).

### **Direct Impacts**

No significant adverse direct impacts would be expected because of the proposed project. No ground-disturbing activities would occur during the proposed project. Therefore, no direct impacts to geological resources would be expected because of the proposed project.

## **Secondary Impacts**

No significant adverse secondary impacts would be expected because of the proposed project. No ground-disturbing activities would occur during the proposed project and the elimination of Brook Trout to protect native WCT would not result in any long-term or ongoing impacts to geology. Therefore, no secondary impacts to geological resources would be expected because of the proposed project.

## **Cumulative Impacts**

No significant adverse cumulative impacts would be expected because of the proposed project. FWP is unaware of any past or present related state projects that would impact geology in the Elk Creek drainage. FWP has not previously treated the affected section of Elk Creek with rotenone. However, if the initial rotenone treatment is unsuccessful in eradicating the Brook Trout population from the affected stretch of Elk Creek, additional treatment may be deemed necessary. If additional treatment with rotenone is deemed necessary, no impacts to the geology of the affected area would be expected.

## **4. Soil Quality, Stability, and Moisture**

### **Existing Environment/No Action Alternative**

Soils in the Madison Range are generally derived from highly erodible sedimentary and volcanic rock (Povililtis 1998). Tertiary sediments are common in the valley bottoms (Sonderegger 1981).

### **Direct Impacts**

No significant adverse direct impacts would be expected because of the proposed project. No ground-disturbing activities would occur because of the proposed project. Therefore, no direct impact to soils would be expected because of the proposed project.

### **Secondary Impacts**

No significant adverse secondary impacts would be expected because of the proposed project. No ground-disturbing activities would occur because of the proposed project and the elimination of Brook Trout to conserve native WCT in the affected section of Elk Creek will not result in any long-term or ongoing impacts to soils. Therefore, no secondary impacts would be expected because of the proposed project.

### **Cumulative Impacts**

No significant adverse cumulative impacts would be expected because of the proposed project. FWP is unaware of any past or present related state projects that would impact soils in the Elk Creek drainage. FWP has not previously treated the affected section of Elk Creek with rotenone. However, if the initial rotenone treatment is unsuccessful in eradicating the hybrid trout population from the affected stretch of Elk Creek, additional treatment may be deemed necessary. If additional treatment with rotenone is deemed necessary, no impacts to soils in the affected area would be expected.

## **5. Vegetation Cover, Quantity, and Quality**

### **Existing Environment/No Action Alternative**

The Elk Creek drainage can be classified as 35% Sagebrush Steppe, 28% Montane Grassland, 19% Agricultural, 5% Wetland and Riparian, 5% Conifer dominated forest, 9% grassland, and 1% human land



use. A more detailed analysis of potential impacts to these species is included below under the section titled *Unique, Endangered, Fragile, or Limited Environmental Resources*.

### **Direct Impacts**

No significant adverse direct impacts would be expected because of the proposed project. Short-term and negligible impacts to vegetation cover, quantity, and quality may occur because of the proposed project. Riparian (streamside) vegetation may be adversely and directly impacted by the trampling of plants from project personnel walking up and down the banks of Elk Creek and its tributaries to conduct the work necessary for the proposed project. The rotenone treatment of Elk Creek would be performed by up to 15 FWP, BLM, USFS, and other partner personnel. Further, only a limited number of personnel (2-3) would operate in each affected stream reach at any given time, thereby mitigating any potential impacts from the trampling of plants.

No sensitive plant species were identified the Elk Creek drainage. There are no anticipated impacts to plant species of concern from this project and it is expected that any impacts to plants from this project would be unnoticeable within one growing season. Additional mitigation would occur by project personnel accessing the affected area(s) using existing trail and road systems to the extent practicable. Cattle grazing does occur in the Elk Creek drainage but at a low intensity.

FWP would adhere to all applicable requirements related to the management and preservation of the affected species as outlined by guidance available for *species of concern*. Therefore, any adverse cumulative impacts to the state-listed *species of concern*, because of the proposed project would be short-term, and negligible. Overall, the proposed project would not be expected to impede the recovery of any of the listed species. Any adverse direct impacts would be short-term, negligible, and mitigated by personnel work practices intended to limit impacts.

### **Secondary Impacts**

No significant adverse secondary impacts would be expected because of the proposed project. Rotenone does not affect plants at concentrations used to kill fish as plants lack the rapid absorption route fish possess (gills). Therefore, no secondary impacts would be expected because of the proposed project.

### **Cumulative Impacts**

No significant adverse cumulative impacts would be expected because of the proposed project. FWP has not previously treated the affected section of Elk Creek with rotenone. However, if the initial rotenone treatment is unsuccessful in eradicating the hybrid trout population, additional treatment may be deemed necessary. If additional treatment with rotenone is deemed necessary, the same potential direct and secondary impacts to vegetation, as previously described, would be expected. FWP is unaware of any other past, present, or future related state projects that would impact vegetation cover, quantity, and quality in the affected area. Further, no ground disturbing activities would occur because of the proposed project. Therefore, no cumulative impacts would be expected because of the proposed project.

## **6. Aesthetics**

### **Existing Environment/No Action Alternative**

The aesthetic resources of the Elk Creek drainage include wide valley bottoms, sagebrush steppes, and some mountain forests with small, fast-flowing streams. Cattle and Bison grazing and irrigation have historically impacted the natural aesthetics of the drainage but to a minimal extent.

### **Direct Impacts**

No significant adverse direct impacts would be expected because of the proposed project. Dead fish may accumulate in certain areas and cause objectionable odors as they decay. However, the project area is located in a remote area on private land, and public access is not permitted. The dead fish will be allowed to naturally decay. Complete decomposition of fish carcasses is expected in 1-2 weeks. Therefore, any adverse direct impacts would be short-term, minor, and mitigated by the use of block nets and the mechanical removal of dead fish.

### **Secondary Impacts**

No significant adverse secondary impacts would be expected because of the proposed project. The elimination of hybrid trout to conserve native WCT in the affected section of Elk Creek will not impact the long-term aesthetic nature of the affected area in any way. Therefore, no secondary impacts would be expected because of the proposed project.

### **Cumulative Impacts**

No significant adverse cumulative impacts would be expected because of the proposed project. FWP has not previously treated the affected section of Elk Creek with rotenone. However, if the initial rotenone treatment is unsuccessful in eradicating the Brook Trout population, additional treatment may be deemed necessary. If additional treatment with rotenone is deemed necessary, no significant adverse cumulative impacts would be expected. FWP is unaware of any other past, present, or future related state projects that would impact the aesthetics of the affected area.

## **7. Air Quality**

### **Existing Environment/No Action Alternative:**

Air quality in the area affected by the proposed project is currently unclassifiable or in compliance with applicable National Ambient Air Quality Standards (NAAQS). Further, no significant point sources of air pollution exist in the area affected by the proposed project. Existing sources of air pollution in the area are limited and generally include unpaved county roads (fugitive dust source), vehicle exhaust emissions, and various agricultural practices (vehicle exhaust emissions and fugitive dust).

### **Direct Impacts**

No significant adverse direct impacts would be expected because of the proposed project. Under the proposed action, vehicles used to transport equipment and personnel to and from the project area will cause exhaust fumes and road dust. Such impacts would be short-term and negligible. Additionally, roads are absent throughout much of the drainage and most treatment sites will be accessed on foot. The proposed project would not cause or contribute to a violation of any applicable NAAQS, as there are no air quality restrictions in the area and the amount and duration of the emissions would be short-term and negligible. Public traffic in the area is prohibited. The entire proposed project area is located on private land and the landowners are supportive and aware of this project. Any impacts to air quality would be short-term, mitigated by work practices, and negligible.

## Secondary Impacts

No significant adverse secondary impacts would be expected because of the proposed project. The elimination of Brook Trout to conserve native WCT in the affected section of Elk Creek will not result in any ongoing, long-term air quality impacts. Therefore, no secondary impacts would be expected because of the proposed project.

## Cumulative Impacts

No significant adverse cumulative impacts would be expected because of the proposed project. FWP has not previously treated the affected section of Elk Creek with rotenone. However, if the initial rotenone treatment is unsuccessful in eradicating the Brook Trout population, additional treatment may be deemed necessary. If additional treatment with rotenone is deemed necessary, no cumulative impacts would be expected. FWP is unaware of any other past, present, or future related state projects that would impact the aesthetics of the affected area.

## 8. Unique, Endangered, Fragile, or Limited Environmental Resources

### Existing Environment/No Action Alternative.

The state of Montana and the USFWS list the Canada lynx (*Lynx canadensis*), North American Wolverine (*Gulo gulo*), and Grizzly Bear (*Ursos arctos*) as *species of concern* and *threatened species*, respectively, that may be present in the Elk Creek drainage. Other state-listed *species of concern* that may be present in the drainage include: Hoary Bat (*Lasiurus cinereus*), little Brown Myotis (*Myotis lucifugus*) (mammal), Westslope Cutthroat Trout, (*Thymallus arcticus*) (aquatic), Brewer's Sparrow (*Spizella breweri*), Long-billed Curlew (*Numenius americanus*), Brown Creeper (*Certhia americana*), Evening Grosbeak (*Coccothraustes vespertinus*), Cassin's Finch (*Haemorhous cassinii*), Great Blue Heron (*Ardea Herodias*), Greater Sage Grouse (*Centrocercus urophasianus*), Green-tailed Towhee (*Pipilo chlorurus*), Lewis's Woodpecker (*Melanerpes lewis*, birds), and Western Toad (*Anaxyrus borea*, amphibian).

No plant *species of concern* have been identified as present in the Elk Creek drainage. Westslope Cutthroat Trout were historically present in Elk Creek until introductions of non-native Brook Trout put this population at risk through competition.

### Direct Impacts

No significant adverse direct impacts would be expected because of the proposed project.

#### Mammal Species:

The proposed project is located within potential Grizzly Bear habitat, but there are no known Grizzly Bears currently inhabiting the area. Further, the proposed project would have little or no impact on Grizzly Bears because mammals are not sensitive to rotenone at concentrations used to kill fish. Therefore, no adverse impacts to Grizzly Bears that consume fish killed by rotenone or drink treated waters would be expected. Direct potential impacts to Grizzly Bears would include potential short-term (< one week) displacement due to increased human presence along the affected section of Elk Creek.

The proposed project is also within the range of Canada Lynx and wolverine. Lynx and wolverine are not common but have been observed in adjacent drainages to Elk Creek. Again, because mammals are not sensitive to rotenone at concentrations used to kill fish, no adverse impacts from rotenone treatment would be expected because of the proposed project. Adverse impacts to lynx and wolverine that may use or travel through the affected area include only temporary displacement when personnel are

present. The affected area, which may be used by lynx and wolverine, includes multiple drainages with similar habitat structure and resources; therefore, it would be expected such areas would be readily used as an alternative to the affected project area by any lynx, wolverine, or Grizzly Bears that may be located within or pass through the affected area.

Ultimately, no impacts would be expected from Grizzly Bears, lynx, or wolverine consuming treated waters or fish killed by rotenone for the reasons previously noted. See analysis of impacts to *Terrestrial, Avian, and Aquatic Life and Habitats* for additional discussion of potential rotenone impacts on mammals. Therefore, any direct adverse impacts to Grizzly Bears, wolverine, or lynx would be short-term and minor. Grizzly Bears, Canada Lynx, and wolverine are present in the Madison Range but typically are not observed within the affected area.

Specific to the ESA-listed *threatened* Grizzly Bear, Canada Lynx, and North American Wolverine, the ESA defines "take," which constitutes a significant adverse impact, as follows: to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or to attempt to engage in any such conduct. 16 U.S.C. 1542(b). The term *harm* in the definition of 'take' means an act which kills or injures wildlife. Such an act may include *significant habitat modification or degradation* where it actually kills or injures wildlife by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering." 50 C.F.R. § 17.3.

To find that habitat modification (addition of rotenone to aquatic environment) constitutes a *taking* of a listed species under the federal definition of "harm", all aspects of the harm definition must be triggered. Therefore, for the purposes of the proposed project, the following conditions must all be met for a *taking* or a significant adverse impact to occur to Grizzly Bears, North American Wolverine, and Canada Lynx (USFWS, FWS/AES/067974, April 26, 2018):

- Is the modification of habitat significant? No. Mammals are highly tolerant of rotenone at the proposed concentration. Further, the proposed project would be short-lived and intermittent, thereby limiting the duration and extent of any potential impacts associated with displacement caused by human presence. Therefore, no significant adverse impacts to any of the ESA-listed mammals would be expected because of the proposed project.
- If so, does that modification also significantly impair an essential behavior pattern of an ESA-listed species? NA
- If so, is the significant modification of the habitat, with a significant impairment of an essential behavior pattern, likely to result in the actual killing or injury of wildlife? NA

Therefore, the proposed project would not constitute a *take* under the ESA and thus would not result in significant, adverse impact to any of the identified ESA-listed species.

The Hoary Bat and Little Brown Myotis constitute state-listed *species of concern* that are potentially located in the affected area. Again, because mammals are not sensitive to rotenone at concentrations used to kill fish, no adverse impacts from rotenone treatment would be expected because of the proposed project. Direct impacts to these *species of concern* include only temporary displacement due to increased human activity in the drainage.

#### Avian Species:

Brewer's Sparrow (*Spizella breweri*), Long-billed Curlew, Brown Creeper, Evening Grosbeak, Cassin's Finch, Great Blue Heron, Greater Sage Grouse, Green-tailed Towhee, and Lewis's Woodpecker are listed as *species of special concern* which may be present in the affected area. For most of these species, direct impacts include only temporary displacement due to increased human activity in the drainage. Because

Great Blue Herons are piscivorous (i.e., fish eaters), they may be displaced from the project area by the removal of fish from Elk Creek for 1-2 years, until WCT have repopulated the creek.

No machinery, helicopters, or other heavy equipment would be used to implement the project. Therefore, adverse impacts related to the potential for project-related displacement of affected species would be mitigated. Pickup trucks and possibly ATVs would be used on existing roads to access the stream(s). Most of the Elk Creek drainage will be accessed on foot during the proposed treatment.

Vegetation Life:

No sensitive plant species have been identified as present in the Elk Creek drainage. Therefore, the presence of project personnel and associated trampling of riparian vegetation would not be expected to adversely impact any plant *species of concern*.

Aquatic Life:

WCT are considered a *sensitive species* and a *species of concern*. The proposed project intends to restore native WCT to Elk Creek by removing Brook Trout and repopulating the stream with aboriginal populations of WCT. The resulting population would be secured in greater than eight miles of habitat. Therefore, any direct impacts to WCT in the affected area would be long-term, moderate, and beneficial.

Western Toads constitute a *species of concern* and may be present in the Elk Creek drainage. The proposed action could have minor impacts on larval toads but would not be expected to significantly impact adults. Rotenone can affect larval amphibians because larval amphibians respire through their skin and gills. Western Toads select lentic waters for reproduction and the rearing of tadpoles. However, impacts from this project are expected to be minor because adults are less susceptible to rotenone and amphibians can easily repopulate areas through normal dispersal patterns. WCT may prey upon Western Toad tadpoles, but no more than the established population of Brook Trout. Therefore, it is expected any adverse impacts to Western Toads because of the proposed project would be short-term and negligible.

FWP would adhere to all applicable requirements related to the management and preservation of the affected species as outlined by federal and state guidance available for at-risk species. Therefore, adverse direct impacts to any state and/or federally-listed species because of the proposed project would be short-term, and negligible. Overall, the proposed project would not be expected to impede recovery of any of the identified state or federally-listed species.

## **Secondary Impacts**

No significant adverse secondary impacts would be expected because of the proposed project. The proposed project would benefit WCT and would be consistent with existing conditions. Any expected long-term secondary impacts would be negligible to moderate and beneficial.

## **Cumulative Impacts**

No significant adverse cumulative impacts would be expected because of the proposed project. MEPA, defines *cumulative impacts* as “the collective impacts on the human environment of the proposed action when considered in conjunction with other past and present actions related to the proposed action by location or generic type. Related future actions must also be considered when these actions are under concurrent consideration by any state agency through pre-impact statement studies, separate impact statement evaluation, or permit processing procedures.”

Cumulatively, the proposed project would benefit historic and ongoing WCT conservation efforts in the Madison Valley, which helps FWP meet its obligation to prevent these species from becoming listed as *threatened* or *endangered* under the ESA. Further, no cumulative impacts to species currently listed as threatened under the ESA would be expected because of the proposed project.

The long-term goal for WCT conservation is to restore secure conservation populations to 20% of their historic tributary distribution east of the Continental Divide (Upper Missouri River Basin upstream from and including the Judith River; FWP 2019). With consideration for related past, present, and known future actions in the Madison River drainage, once the proposed project is completed WCT will occupy 213 miles of stream or 73% of the restoration goal. Collectively, WCT conservation projects like the one proposed for Elk Creek are intended to secure a small amount of the overall fish-bearing habitat for WCT to ensure the species long-term, self-sustaining persistence while managing the vast majority of habitat (80%) for non-native fish like Brook Trout, Rainbow Trout, and Brown Trout. Therefore, any cumulative impacts to affected WCT populations in the Madison Valley, specifically the Madison River drainage, would be long-term, moderate to major, and beneficial.

FWP has not previously treated the affected section of Elk Creek with rotenone. However, if the initial rotenone treatments are unsuccessful in eradicating the Brook Trout population, additional treatment may be deemed necessary. If additional treatment with rotenone is deemed necessary, no cumulative impacts would be expected. FWP is unaware of any other past, present, or future related state projects that would impact any unique, fragile, or limited environmental resources in the affected area.

## 9. Historical and Archaeological Sites

### **Existing Environment/No Action Alternative**

Historical resources in the Elk Creek drainage include evidence of use by Native Americans and early European settlers. Man-made irrigation structures, roads, and houses already exist in the drainage.

### **Direct Impacts**

No significant adverse direct impacts would be expected because of the proposed project. No ground disturbance would occur except for the potential for vegetation trampling by project personnel. In keeping with the Montana Antiquities Act and related regulations (12.8.501-12.8.510), all undertakings on state lands are assessed by a qualified archaeologist or historian for their potential to affect cultural resources. The process for this assessment may include a cultural resource inventory and evaluation of cultural resources within or near the project area, in consultation with the State Historic Preservation Office, as necessary. FWP also consults with all Tribal Historic Preservation Offices affiliated with each property in accordance with FWP's Tribal Consultation Guidelines. If cultural resources within or near the project area are recorded and are eligible for the National Register of Historic Places, they will be protected from adverse impacts through adjustments to the project design or cancellation of the project if no design alternatives are available. If cultural resources are unexpectedly discovered during project implementation, FWP will cease implementation, and contact FWP's Heritage Program for further evaluation. Therefore, no adverse direct impacts to any cultural resources (historical, archaeological) that may exist in the affected area would be expected because of the proposed project.

### **Secondary Impacts**

No significant adverse secondary impacts would be expected because of the proposed project. No ground disturbance would occur because of the proposed project. In addition, the elimination of Brook

Trout to conserve native WCT in the affected section of Elk Creek will not result in any ongoing, long-term impacts to any cultural resources that may be located in the affected area. Therefore, no adverse secondary impacts would be expected because of the proposed project.

### **Cumulative Impacts**

No significant adverse cumulative impacts would be expected because of the proposed project. FWP has not previously treated the affected section of Elk Creek with rotenone. FWP is unaware of any other past, present, or future related state projects that would impact any cultural resources that may be located in the affected area. No cumulative impacts to cultural resources would be expected because of the non-native fish removal project. Therefore, no adverse cumulative impacts would be expected because of the proposed project.

## **10.Demands on Environmental Resources of Land, Water, Air, and Energy**

### **Existing Environment/No Action Alternative**

The existing aquatic and terrestrial resources have been described previously in this document. Demands on environmental resources are currently limited to water use for Bison.

### **Direct Impacts**

No significant adverse impacts to demands on the environmental resources of land, water, air, and energy would be expected because of the proposed project. Fuel would be required to operate equipment used for the proposed project. However, any impacts would be limited by the anticipated short timeline of the proposed project and, as such, the amount of fuel used would be negligible. Therefore, any impacts to the demands for energy would be short-term and negligible.

As identified previously through the analyses of potential impacts to water quality, quantity, and distribution; soil quality, stability, and moisture; vegetation cover, quantity, and quality; and air quality; some impacts to the environmental resources of land water, and air may occur because of the proposed project. However, any such impacts would be short-term and negligible or minor (see cited impacts analyses above). No other impacts to the demands on environmental resources of land, water, air, and energy would be expected because of the proposed project.

### **Secondary Impacts**

No significant adverse secondary impacts would be expected because of the proposed project. The elimination of existing Brook Trout to conserve native WCT in the affected section of Elk Creek will not result in any changes to current water use. Therefore, no secondary impacts would be expected because of the proposed project.

### **Cumulative Impacts**

No significant adverse cumulative impacts would be expected because of the proposed project. No additional demands for the environmental resources of land, water, air, and energy would be expected because of the proposed project. Further, FWP is unaware of any other past, present, or future related state projects that would impact the environmental resources of land, water, air, and energy in the affected area. Therefore, no cumulative impacts would be expected because of the proposed project.



## B. Evaluation and Summary of Potential Impacts of the Proposed Project on the Human Environment

### 1. Social Structures and Mores

#### **Existing Environment/No Action Alternative**

WCT and Yellowstone Cutthroat Trout (YCT) represent the two subspecies of native cutthroat found in Montana and together they have been designated Montana's state fish. Many Montanans and visitors to the state hold high regard for WCT as an angling resource, an icon of the state, and a valuable component of the ecosystems in which they reside. As such, WCT, and associated recreational values, are deeply engrained in the customs and lifestyles of residents and visitors to Montana alike.

#### **Direct Impacts**

No significant adverse direct impacts would be expected because of the proposed project. The restoration of WCT to Elk Creek may be viewed as restoring the cultural values of the existing and historic human population in the area affected by the proposed project. Native fish restoration projects in Montana generally have the support of indigenous tribes and many people who enjoy fishing for and otherwise appreciate native species on the landscape. Any adverse direct impacts associated with the elimination of Brook Trout from the affected section of the stream Brook Trout would be mitigated by other nearby opportunities to fish for these non-native fish species during and following the proposed project. Nearby fisheries in Madison drainage receive greater angling pressure than Elk Creek and Brook Trout populations in these waterbodies would remain intact.

The proposed project intends to conserve and expand the habitat of native WCT in Elk Creek by eliminating competition from Brook Trout. Therefore, the proposed project would create a unique native fishery that would directly benefit any person who values the species' existence, the State of Montana, and the ecosystem in which they reside. Any direct impacts from the proposed project would be long-term, moderate, and beneficial.

#### **Secondary Impacts**

No significant secondary impacts would be expected because of the proposed project. The elimination of Brook Trout to conserve native WCT in the affected section of Elk Creek will not result in any ongoing, long-term impacts to current land use or human activities in the affected area. However, many Montanans, and those visiting the state for outdoor recreational purposes, hold high regard for the conservation of native species on the landscape, including WCT. Therefore, because the proposed project would increase WCT distribution, the proposed project would preserve important pre-project social structures, customs, values, and conventions associated with WCT in the affected area. Further, the loss of WCT populations would reduce its remaining range and could contribute to their listing as threatened or endangered species under the ESA. Listing under the ESA would drastically change the state's management of the species and likely limit the opportunity to fish for and enjoy this native fish species.

Any secondary impacts associated with eliminating the Brook Trout fishery from the affected section of Elk Creek would be mitigated by other opportunities to fish for Brook Trout, as numerous surrounding

streams will continue to provide recreational fisheries. Therefore, any adverse secondary impacts would be long-term and minor.

### **Cumulative Impacts**

No significant adverse cumulative impacts would be expected because of the proposed project. FWP has not previously treated the affected section of Elk Creek with rotenone. However, if the initial rotenone treatment is unsuccessful in eradicating the Brook Trout population, additional treatment may be deemed necessary. If additional treatment with rotenone is deemed necessary, no cumulative impacts would be expected.

Further, Montana's existing WCT conservation plan intends to restore WCT to 20% of its historic range and to maintain genetically pure populations. The loss of WCT populations would result in a reduction in the remaining range of species and could lead to their listing as threatened or endangered under the ESA, changing state management of the species, and likely limiting public opportunity to fish for and otherwise interact with and enjoy these native fish species. FWP is unaware of any other past, present, or future related state projects that would cumulatively impact the existing social structures and mores of the affected human population, related to the affected native salmonid populations. Therefore, any cumulative impacts would be long-term, moderate, and beneficial.

## **2. Cultural Uniqueness and Diversity**

### **Existing Environment/No Action Alternative**

The proposed project would be entirely located within private land. The lower end of the drainage is private and would remain as is.

### **Direct Impacts**

No significant direct impacts to the cultural uniqueness and diversity of the affected human population would be expected because of the proposed project. The elimination of Brook Trout to conserve native WCT in the affected section of Elk Creek will not result in any impacts to current land use or human activities in the affected area and would not be expected to result in the relocation of people into or out of the affected area. Therefore, no impacts to the existing cultural uniqueness and diversity of the affected human population would be expected because of the proposed project.

### **Secondary Impacts**

No significant adverse secondary impacts would be expected because of the proposed project. The proposed action would not be expected to result in any relocation of people into or out of the affected area. Therefore, no impacts to the existing cultural uniqueness and diversity of the affected human population would be expected because of the proposed project.

### **Cumulative Impacts**

No significant adverse cumulative impacts would be expected because of the proposed project. FWP has not previously treated the affected section of Elk Creek with rotenone. However, if the initial rotenone treatment is unsuccessful in eradicating the Brook Trout population, additional treatment may be deemed necessary. If additional treatment with rotenone is deemed necessary, no cumulative impacts

would be expected. FWP is unaware of any other past, present, or future related state projects that would impact social structures and mores of the affected human population.

### **3. Access to and Quality of Recreational and Wilderness Activities**

#### **Existing Environment/No Action Alternative**

Under the No Action alternative, there would be no change in access to and the quality of recreational activities in the Elk Creek drainage. Upper Elk Creek is located on private lands and is not accessible to the public. However, it is possible that WCT would likely move downstream to the Madison River and contribute to that fishery. The possibility of catching or otherwise enjoying the existence of native WCT or in the Madison River would be reduced under the No Action Alternative.

#### **Direct Impacts**

No significant adverse direct impacts would be expected because of the proposed project. The upper end of Elk Creek is not accessible to the public and lies on private lands. The lower half of Elk Creek would not be closed during or after project implementation and is located on private property and public property, administered by the state of Montana, where most access is gained only through landowner permission.

Further, numerous nearby opportunities to fish for Brook Trout would offset any adverse impacts realized by the removal of such species from the project area of the Elk Creek drainage. Multiple nearby streams of similar size, and with similar fisheries to the existing Elk Creek fishery, exist within 10-20 miles of Elk Creek. These streams provide ample opportunities to angle for non-native trout in a small stream and would be available for public access during implementation of the proposed project. Therefore, any adverse direct impacts would be short-term, negligible, and mitigated by other nearby and similar angling opportunities.

#### **Secondary Impacts**

No significant adverse secondary impacts would be expected because of the proposed project. Once native WCT is re-established in the affected upper 8-mile stretch of Elk Creek, it would be expected these native species would trickle down to the Madison River and provide angling opportunities to catch WCT.

The long-term goal for WCT conservation in Montana is to restore secure conservation populations of WCT to 20% of their historic tributary distribution east of the Continental Divide (Upper Missouri River Basin upstream from and including the Judith River; FWP 2019) and to maintain genetically viable populations of the species. Mainstem rivers, such as the Madison River, support important non-native recreation fisheries (i.e., Brown, Brook, and Rainbow Trout) and are not part of the WCT conservation goals. FWP recognizes the value of non-native trout fisheries and would continue to manage 80% of the streams in the upper Missouri River for non-native species.

Projects that restore WCT, such as that proposed for Elk Creek, are necessary to ensure the continued survival of this native species, conserve its remaining genetic diversity, meet statutory obligations to prevent its listing under the ESA and preserve angling opportunities for these native species. The proposed project would restore and protect (as a conservation population) native WCT in the affected area. Therefore, any secondary impacts would be long-term, moderate to major, and beneficial.

## **Cumulative Impacts**

No significant adverse cumulative impacts would be expected because of the proposed project. FWP has not previously treated the affected section of Elk Creek with rotenone. However, if the initial rotenone treatments are unsuccessful in eradicating the Brook Trout population, additional treatment may be deemed necessary. If additional treatment with rotenone is deemed necessary, no additional cumulative impacts would be expected. FWP is unaware of any other past, present, or future related state projects that would impact access to and the quality of recreational opportunities in the affected area because of the proposed project.

## **4. Local and State Tax Base and Tax Revenue**

### **Existing Environment/No Action Alternative**

The Upper Elk Creek drainage is in the Madison Range on private land which is subject to state and local taxes.

### **Direct Impacts**

No significant adverse direct impacts would be expected because of the proposed project. The proposed project does not involve the acquisition of land or property, does not change land use, does not result in the production of any products, and does not displace any existing businesses. The proposed project would be expected to increase state and local tax revenues from the sale of fuel, supplies, and/or equipment necessary to implement and complete the proposed project. Because the proposed project would be limited to 2-5 days per year over two consecutive years, the use of fuel and purchase of products to implement the project would be limited. Therefore, any adverse direct impacts would be short-term and negligible, lasting only as long as the proposed project.

### **Secondary Impacts**

No significant adverse secondary impacts would be expected because of the proposed project. The proposed project does not involve the acquisition of land or property, production of any products, or displacement of any existing businesses. Therefore, long-term impacts to the existing local and state tax base and tax revenue from such activities would not occur because of the proposed project.

The proposed project may adversely affect anglers who enjoy fishing for Brook Trout or, conversely, beneficially impact those who prefer to fish for native WCT. Therefore, the proposed project may adversely or beneficially impact the associated local purchase of fishing licenses and goods and services to accommodate fishing opportunities. However, because the proposed project would impact a relatively small section of Elk Creek, and many other nearby opportunities exist to fish for or otherwise enjoy recreational opportunities associated with Brook Trout or the restored native WCT populations, any secondary impacts to the local and state tax base and tax revenue because of the proposed project would be short-term and negligible to minor.

### **Cumulative Impacts**

No significant adverse cumulative impacts would be expected because of the proposed project. FWP has not previously treated the affected section of Elk Creek with rotenone. However, if the initial rotenone treatment is unsuccessful in eradicating the hybrid trout population, additional treatment may be deemed necessary. If additional treatment with rotenone is deemed necessary, no cumulative impacts

would be expected. FWP is unaware of any other past, present, or future related state projects that would impact local and state tax base and tax revenues.

## 5. Industrial, Commercial, and Agricultural Activities and Production

### **Existing Environment/No Action Alternative**

Outfitting and agriculture are two commercial activities that occur in the Elk Creek drainage. The primary commercial, agricultural activities in the Madison Valley, including the Elk Creek drainage, constitute cattle and cattle grazing operations. Outfitting occurs for fishing and hunting throughout most of the Madison Valley, however, outfitting in the Elk Creek drainage is limited to one outfitter. Based on local scoping activities and similar projects nearby, private landowners with grazing and irrigation rights are supportive of the proposed project, and agreements will be put in place to ensure that all current agricultural practices will remain that way following the conclusion of the proposed project. No timber harvest or mining occurs within the drainage.

### **Direct Impacts**

No significant adverse direct impacts would be expected because of the proposed project. Commercial outfitting in the headwaters will remain intact. Private landowners with grazing and irrigation rights in Elk Creek are supportive of this project, and agreements will be put in place to ensure that all agricultural practices currently in place will remain that way following the conclusion of the proposed project. The elimination of Brook Trout to conserve native WCT and in the affected section of Elk Creek will not result in any direct impact to commercial, industrial, or agricultural activities and/or production. While rotenone is actively in the stream, livestock will be temporarily excluded from accessing Elk Creek. However, current agricultural practices will be resumed when the project is complete (2-5 days). Therefore, no significant direct impacts would be expected because of the proposed project.

### **Secondary Impacts**

No significant adverse secondary impacts would be expected because of the proposed project. No industrial activities occur in the affected area; therefore, no industrial activities or production would be impacted by the proposed project.

The elimination of Brook Trout to conserve native WCT in the affected section of Elk Creek will not result in any impact to commercial outfitting or agricultural activities and production. Because the proposed project would impact a relatively small section of Elk Creek, and numerous other opportunities to fish for the affected native and non-native fish species exist in the affected area, any secondary impacts to fishing outfitters would be negligible.

### **Cumulative Impacts**

No significant adverse cumulative impacts would be expected because of the proposed project. FWP has not previously treated the affected section of Elk Creek with rotenone. However, if the initial rotenone treatment is unsuccessful in eradicating the hybrid trout population, additional treatment may be deemed necessary. If additional treatment with rotenone is deemed necessary, no cumulative impacts would be expected. FWP is unaware of any other past, present, or future related state projects that would impact social structures and mores of the affected human population.

## 6. Human Health and Safety

## Existing Environment/No Action Alternative.

There are no known human health or safety concerns within the Elk Creek drainage.

### Direct Impacts

No significant adverse direct impacts would be expected because of the proposed project. Direct contact with water treated with rotenone and consumption of fish exposed to rotenone may impact human health. Further, the application and management of rotenone to complete the proposed project would incur some potential risk to the health and safety of those working with the chemical.

The primary means of protecting human health from the potential impacts of rotenone application is to follow the label requirements. These include public entry restrictions into a treatment area and preventing consumption of rotenone-killed fish. Applicators of rotenone face the highest probability of being exposed to rotenone. Their safety would be protected by the use of label-required personal protective equipment including gloves, waders, eye protection, and a respirator. The EPA (2007) analyzed the human health risks of rotenone exposure and concluded it has a high acute toxicity in its concentrated form for both oral and inhalation routes but has a low acute toxicity for the dermal route of exposure. However, when diluted with water at concentrations proposed for the treatment of Elk Creek, no adverse impacts to human health and safety would be expected.

Rotenone is not an eye or skin irritant or a skin sensitizer. The EPA concluded there is a low risk for human chronic risk from exposure to rotenone treated water based on four principles: first, the rapid natural degradation of rotenone, second, using active detoxification measures by applicators such as potassium permanganate, third, properly following piscicide labels and the extra precautions stated in this document and, finally, proper signing, public notification, and area closures, which would eliminate or limit the potential for public exposure to rotenone treated water.

Rotenone is a naturally occurring substance derived from tropical plants in the bean family such as the jewel vine *Derris spp.* and lacepod *Lonchocarpus spp.* found in Australia, southern Asia, and South America. Rotenone has been used by native people for centuries to capture fish for food in areas where these plants are naturally found (Teixeira, et al. 1984). The plant roots that produce rotenone also produce other similar compounds, collectively called rotenoids. Rotenone is produced in the greatest quantity and has the greatest toxic effect on fish and other gill-breathing organisms; the next most active rotenoid is deguelin. These two rotenoids degrade under different environmental conditions to rotenone and tephrosin, respectively. The EPA (2007) and Fang and Cassida (1997) concluded these other rotenoids are less toxic than rotenone.

The risk to humans from recreational exposure to rotenone would be negligible. The EPA (2007) established 90 ppb as a threshold level of concern for recreational exposure, meaning there will be no health effects on humans exposed to levels in water below 90 ppb. Swimming is the primary recreational activity of concern to the EPA, and rotenone labels require the posting of placards at public access points to the treatment area prohibiting access while rotenone is being applied. If the stream is treated with less than 90 ppb rotenone, the placards can be removed immediately after the treatment is over; Elk Creek by comparison will be treated at 50 ppb. Also, during the application, personnel would be on site to inform the public and escort them from the treatment area should they enter. Rotenone treated waters would be contained to the proposed treatment areas by adding KMnO<sub>4</sub> to the stream at the existing fish barrier, which would neutralize any remaining rotenone before leaving the project area. The efficacy of the neutralization would be monitored using fish (the most sensitive species to the

chemical) and a handheld meter. Therefore, the potential for public exposure to rotenone treated waters is minimal and no direct impacts would be expected as a result of the proposed project.

The risk to humans from drinking rotenone treated water would also be negligible. The EPA (2007) established a threshold level of concern of 40 ppb rotenone for drinking water. Although Elk Creek will be treated at 50 ppb, placards will prohibit entry to the water within the project area during treatment to prevent exposure. Potassium permanganate (KMnO<sub>4</sub>) will be applied at the Deactivation Station to all water flowing out of the project area to degrade and eliminate rotenone. Following deactivation with KMnO<sub>4</sub>, rotenone will be undetectable (< 1 ppb) and well below the threshold level of concern (40 ppb) making incidental consumption of this water by humans, while not expected, entirely safe. There is a possibility that domestic wells with hydrologic connectivity to treated surface waters could be contaminated by rotenone; however, contamination of groundwater is very unlikely because rotenone has a high affinity for partitioning from water to organic materials in aquifers. Extensive well sampling in areas proximal to rotenone treatments in California, Washington, and Montana has never found measurable levels of rotenone (Finlayson et al 2018).

Fisher (2007) analyzed the inert constituent ingredients found in the rotenone formulation of CFT Legumine (5% rotenone) for the California Department of Fish and Game. These inert ingredients are principally found in the emulsifying agent Fennodefo99 which helps make the generally insoluble rotenone more soluble in water. The constituents were considered because of their known hazard status and not because of their concentrations in the CFT Legumine formulation. Solvents such as xylene, trichloroethylene (TCE), and tetrachloroethylene are residues left over from the process of extracting rotenone from the root and can be found in some lots of CFT Legumine. However, inconsistent detectability and low occurrence in other formulations that used the same extraction process were below the levels for human health and ecological risk. Solvents such as toluene, n-butylbenzene, 1,2,4 trimethylbenzene, and naphthalene are present in CFT Legumine, and when used in other applications can be an inhalation risk. However, because of their low concentrations in this formulation, the human health risk is low. The remaining constituents, the fatty acid esters, resin acids, glycols, substituted benzenes, and 1-hexanol were likewise present but either analyzed, calculated, or estimated to be below the human health risk levels when used in a typical fish eradication project. Methyl pyrrolidone is also found in CFT Legumine. It is known to have solvency properties and is used to dissolve a wide range of compounds including resins (rotenone). Analysis of Methyl pyrrolidone in CFT Legumine showed it represents about 9% of the formulation (Fisher 2007). Fisher 2007 concluded, "None of the constituents identified are considered persistent in the environment nor will they bioaccumulate. The trace benzenes identified in the solvent mixture of CFT Legumine™ will exhibit limited volatility and will rapidly degrade through photolytic and biological degradation mechanisms. The PEGs are highly soluble, have very low volatility, and are rapidly biodegraded within a matter of days. The fatty acids in the fatty acid ester mixture (Fennodefo99™) do not exhibit significant volatility, are virtually insoluble, and are readily biodegraded, although likely over a slightly longer time than the PEGs in the mixture. None of the new compounds identified exhibit persistence or are known to bioaccumulate. Under conditions that would favor groundwater exchange the highly soluble PEGs could feasibly transmit to groundwater, but the concentrations in the reservoir, and the rapid biodegradation of these constituents make this scenario extremely unlikely. Based upon a review of the physical chemistry of the chemicals identified, FWP concludes they are rapidly biodegraded, hydrolyzed, and/or otherwise photolytically oxidized; therefore, the affected chemicals pose no additional risk to human health or ecological receptors from those identified in the earlier analysis. None of the constituents identified appear to be at concentrations that suggest human health risks through exposure to water, or



ingestion exposure scenarios, and no relevant regulatory criteria are exceeded in estimated exposure concentrations.

One study, in which rats were injected with rotenone for a period of weeks, reported finding lesions characteristic of Parkinson's disease (Betarbet et al. 2000). However, the relevance of the results to the use of rotenone as a piscicide has been challenged based upon the following dissimilarities between the experimental methodology used and fisheries-related applications: (1) the continuous intravenous injection method used to treat the rats leads to "continuously high levels of the compound in the blood," unlike field applications where 1) the oral route is the most likely method of exposure, 2) a much lower dose is used and 3) potential exposure to rotenone is limited to a matter of days because of the rapid breakdown of the rotenone following application. Further, dimethyl sulfoxide (DMSO) was used to enhance tissue penetration in the laboratory experiment (normal routes of exposure slow introduction of chemicals into the bloodstream), no such chemicals enhancing tissue penetration are present in the rotenone formulation proposed for use in this treatment. Similar studies (Marking 1988) have found no Parkinson's-like results. Extensive research has demonstrated that rotenone does not cause birth defects (HRI 1982), gene mutations (Van Geothem et al. 1981; BRL 1982), or cancer (Marking 1988). Rotenone was found to have no direct role in the fetal development of rats that were fed high concentrations of rotenone. Spencer and Sing (1982) reported that rats that were fed diets laced with 10-1,000 ppm rotenone over 10 days did not suffer any reproductive dysfunction. Typical concentrations of actual rotenone used in fishery management range from 1-2 ppm and are far below that administered during most toxicology studies.

A study linked the use of rotenone and paraquat with the development of Parkinson's disease (PD) in humans later in life (Tanner et al. 2011). The after-the-fact study included mostly farmers from 2 states within the United States who presumably used rotenone for terrestrial application to crops and/or livestock. Rotenone is no longer used for agricultural applications and is only used in aquatic applications as a piscicide. The results of epidemiological studies of pesticide exposure, such as this one have been highly variable (Guenther et al. 2011). Studies have found no correlations between pesticide exposure and PD (e.g., Jiménez-Jiménez 1992; Hertzman 1994; Engel et al. 2001; Firestone et al. 2010), some have found correlations between pesticide exposure and PD (e.g., Hubble et al. 1993; Lai et al. 2002; Tanner et al. 2011) and some have found it difficult to determine which pesticide or pesticide class is implicated if associations with PD occur (e.g., Engel et al. 2001; Tanner et al. 2009). Recently, epidemiological studies linking pesticide exposure to PD have been criticized due to the high variation among study results, generic categorization of pesticide exposure scenarios, questionnaire subjectivity, and the difficulty in evaluating the causal factors in the complex disease of PD, which may have multiple causal factors (age, genetics, environment) (Raffaele et al. 2011). A specific concern is the inability to assess the degree of exposure to certain chemicals, including rotenone, particularly the concentration of the chemical, frequency of use, application (e.g., agricultural, insect removal from pets), and exposure routes (Raffaele et al. 2011). No information is given in the Tanner et al. (2011) study about the formulation of rotenone used (powder or liquid) or the frequency or dose farmers were exposed to during their careers. There is also no information given about the personal protective equipment used or any information about other pesticides farmers were exposed to during the period of the study. Without information on how much rotenone individuals were exposed to and for how long, it is difficult to evaluate the potential risk to humans of developing Parkinson's disease from aquatic applications of rotenone products from this study.

The state of Arizona aptly summarized the issue following an exhaustive review of the risks to human health of rotenone use as a piscicide (Guenther et al. 2011). Guenther et al. 2011 concluded: "To date, there are no published studies that conclusively link exposure to rotenone and the development of

clinically diagnosed PD.” Some correlation studies have found a higher incidence of PD with exposure to pesticides among other factors, and some have not. It is very important to note that in case-control correlation studies, causal relationships cannot be assumed, and some associations identified in odds-ratio analyses may be chance associations. Only one study (Tanner et al. 2011) found an association between rotenone and paraquat use and PD in agricultural workers, primarily farmers. However, there are substantial differences between the methods of application, formulation, and doses of rotenone used in agriculture and residential settings compared with aquatic use as a piscicide, and the agricultural workers interviewed were also exposed to many other pesticides during their careers. Through the EPA reregistration process of rotenone, occupational exposure risk is minimized by new requirements that state handlers may only apply rotenone at less than the maximum treatment concentrations (200 ppb), the development of engineering controls to some of the rotenone dispensing equipment and requiring handlers to wear specific PPE.

No significant adverse direct impacts would be expected because of the proposed project. The label restrictions on rotenone use (i.e., placarding the Treatment Area and deactivation with KMnO<sub>4</sub>) would ensure any public exposure would not occur or would occur at negligible amounts of rotenone. Therefore, any adverse direct impacts associated with human rotenone exposure would be short-term and negligible.

### **Secondary Impacts**

No significant adverse secondary impacts would be expected because of the proposed project. Based on the above discussion of direct impacts (and secondary impacts), no adverse secondary impacts would be expected because of the proposed project.

### **Cumulative Impacts**

No significant adverse cumulative impacts would be expected because of the proposed project. FWP has not previously treated the affected section of Elk Creek with rotenone. However, if the initial rotenone treatment is unsuccessful in eradicating the Brook Trout population, additional treatment may be deemed necessary. If additional treatment with rotenone is deemed necessary, no cumulative impacts would be expected. FWP is unaware of any other past, present, or future related state projects that would impact local and state tax base and tax revenues.

## **7. Quantity and Distribution of Employment**

### **Existing Environment/No Action Alternative**

Employment directly tied to the Elk Creek drainage is primarily attributed to private agricultural activities and commercial outfitting. FWP manages the fish and wildlife resources in the Elk Creek drainage. FWP staff cover these management responsibilities as part of their duties.

### **Direct Impacts**

No significant adverse direct impacts would be expected because of the proposed project. The proposed project would utilize existing agency staff (FWP) and other partners to conduct activities; therefore, no impacts to the quantity and distribution of employment in the affected area would be expected because of the proposed project.

### **Secondary Impacts**

No significant adverse secondary impacts would be expected because of the proposed project. The proposed project may modify ongoing FWP activities in the affected area to ensure the established native WCT population in the affected section of Elk Creek remains intact and viable. However, such activities would not be a departure from typical duties. Therefore, any adverse secondary impacts would be long-term, consistent with existing impacts (FWP staff duties), and negligible.

### **Cumulative Impacts**

No significant adverse cumulative impacts would be expected because of the proposed project. FWP is unaware of any past or present related state projects that would impact geology in the Elk Creek drainage. FWP has not previously treated the affected section of Elk Creek with rotenone. However, if the initial rotenone treatment is unsuccessful in eradicating the Brook Trout population from the affected stretch of Elk Creek, additional treatment may be deemed necessary. If additional treatment with rotenone is deemed necessary, no additional cumulative impacts would be expected.

## **8. Density and Distribution of Human Population and Housing**

### **Existing Environment/No Action Alternative**

No private residences occur within the proposed Elk Creek project area.

### **Direct Impacts**

No significant direct adverse impacts would be expected because of the proposed project. The proposed project would use existing agency personnel (FWP) and other partners and would not otherwise require or result in the movement of existing or new populations into or out of the affected area. Applicators would temporarily camp in the area for the duration of the treatment (<1 week for two years). Private landowners in Elk Creek have been notified and are supportive of the proposed project. Therefore, no direct impacts to the density and distribution of population and housing would be expected because of the proposed project.

### **Secondary Impacts**

No significant adverse secondary impacts would be expected because of the proposed project. The proposed project would use existing government personnel and would not otherwise require or result in the movement of existing or new populations into or out of the affected area. Therefore, no secondary impacts would be expected because of the proposed project.

### **Cumulative Impacts**

No significant adverse cumulative impacts would be expected because of the proposed project. FWP is unaware of any past or present related state projects that would impact the density and distribution of the human population and housing in the affected area. FWP has not previously treated the affected section of Elk Creek with rotenone. However, if the initial rotenone treatment is unsuccessful in eradicating the Brook Trout population from the affected stretch of Elk Creek, additional treatment may be deemed necessary. If additional treatment with rotenone is deemed necessary, no impacts would be expected because of the proposed project.

## **9. Demands for Government Services**

### **Existing Environment/No Action Alternative.**

Landowners manage the land in the affected area and FWP manages the wildlife and fisheries resources of the drainage. The loss of additional native WCT populations across Montana, including in the Madison Valley, could result in the species being federally listed as threatened or endangered under the ESA. Native WCT have been petitioned for ESA listing in the past and if conservation actions are not performed, these species could qualify for ESA listing in the future. Federally ESA-listed species require significantly more government resources to manage than a species that is under state jurisdiction.

### **Direct Impacts**

No significant adverse direct impacts would be expected because of the proposed project. Primarily government personnel (FWP) would be used to implement and complete the proposed project. The proposed project would require 2-5 days of work for up to 15 government employees. The affected native WCT population would be expected to readily re-establish themselves and become self-sustaining without further government assistance. Therefore, any adverse direct impacts would be short-term and negligible.

### **Secondary Impacts**

No significant adverse secondary impacts would be expected because of the proposed project. The proposed project may modify ongoing FWP activities in the affected area to ensure the established WCT populations in the affected section of Elk Creek remain intact and viable. Modified activities would include periodic monitoring of the restored WCT population, including genetic testing. Any secondary impacts would be long-term and minor because all remaining WCT populations are monitored with roughly the same frequency and effort.

### **Cumulative Impacts**

No significant adverse cumulative impacts would be expected because of the proposed project. FWP has not previously treated the affected section of Elk Creek with rotenone. However, if the initial rotenone treatment is unsuccessful in eradicating the Brook Trout population from the affected stretch of Elk Creek, additional treatment may be deemed necessary. If additional treatment with rotenone is deemed necessary, no adverse cumulative impacts would be expected because of the proposed project.

## **10. Locally Adopted Environmental Plans and Goals**

### **Existing Environment/No Action Alternative**

Under the No Action Alternative, the current fishery in Elk Creek would remain intact. It is likely that more non-hybridized populations of WCT in the Madison River drainage will be lost within the next 5-10 years, and FWP would have to create vacant habitat in other streams to protect populations that cannot be protected in place. The aboriginal population of WCT in Elk Creek is threatened by competition with Brook Trout. FWP is obligated to keep species from being listed under the ESA. FWP also manages WCT according to the Memorandum of Understanding and Conservation Agreement for Westslope Cutthroat Trout in Montana (2007), Memorandum of Understanding Concerning (2007), WCT Conservation Strategy for the Missouri Headwaters of Southwest Montana (2022), Upper Missouri River Conservation Strategy (2022), and Montana Statewide Fisheries Program and Guide (2023).

### **Direct Impacts**

No significant direct adverse impacts would be expected because of the proposed project. The proposed action would adhere to existing state policy, guidelines, and strategies and thereby further FWP’s objectives under these existing plans (MFWP 2007, MFWP 2023, Jaeger et al. 2022). Therefore, any impacts would be long-term, minor to moderate, and beneficial.

### Secondary Impacts

No significant adverse secondary impacts would be expected because of the proposed project. The proposed project would preserve a conservation population of native WCT in the affected section of Elk Creek, thereby enabling Montana to maintain the affected species. Further, the proposed action would adhere to existing state policy, guidelines, and strategies (MFWP 2007, MFWP 2019, Jaeger et al. 2022), thereby furthering FWP’s objectives related to the long-term management of WCT. Any secondary impacts would be long-term, moderate to major, and beneficial.

### Cumulative Impacts

No significant adverse cumulative impacts would be expected because of the proposed project. The proposed project would benefit native WCT conservation efforts, which would help FWP meet its obligation to prevent the species from becoming listed as threatened or endangered under the ESA and prevent the extirpation of these iconic native Montana fish species. The long-term goal for WCT conservation is to restore secure conservation populations of WCT to 20% of their historic tributary distribution east of the Continental Divide (Upper Missouri River Basin upstream from and including the Judith River; FWP 2019). Once the proposed project is completed and combined with similar projects performed in the Madison River drainage, WCT will occupy 213 miles of stream or nearly 73% of the restoration goal. Collectively, WCT conservation projects, like the proposed project, are intended to secure a small amount of the overall fish-bearing habitat for WCT to ensure the species long-term, self-sustaining persistence while managing the vast majority of habitat (80%) for non-native fish like Brook Trout, Rainbow Trout, and Brown Trout.

FWP has not previously treated the affected section of Elk Creek with rotenone. However, if the initial rotenone treatment is unsuccessful in eradicating the hybrid trout population, additional treatment may be deemed necessary. If additional treatment with rotenone is deemed necessary, no adverse cumulative impacts would be expected.

## X. Determining the Significance of Impacts

If the EA identifies impacts associated with the proposed action FWP must determine the significance of the impacts. This determination forms the basis for FWP’s decision as to whether it is necessary to prepare an environmental impact statement. FWP considered the criteria identified in **Table 3** below to determine the significance of each impact on the quality of the physical and human environment. ARM 12.2.431.

The significance determination is made by giving weight to these criteria in their totality. For example, impacts identified as moderate or major in severity may not be significant if the duration is short-term. However, moderate or major impacts of short-term duration may be significant if the quantity and quality of the resource is limited and/or the resource is unique or fragile. Further, moderate or major impacts to a resource may not be significant if the quantity of that resource is high or the quality of the resource is not unique or fragile.

**Table 3: Determining the Significance of Impacts**

Criteria Used to Determine Significance
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1	<p>The <b>severity, duration, geographic extent, and frequency</b> of the occurrence of the impact</p> <p><b>“Severity”</b> describes the density of the potential impact, while <b>“extent”</b> describes the area where the impact will likely occur, e.g., a project may propagate ten noxious weeds on a surface area of 1 square foot. Here, the impact may be high in severity, but over a low extent. In contrast, if ten noxious weeds were distributed over ten acres, there may be low severity over a larger extent.</p> <p><b>“Duration”</b> describes the time period during which an impact may occur, while <b>“frequency”</b> describes how often the impact may occur, e.g., an operation that uses lights to mine at night may have frequent lighting impacts during one season (duration).</p>
2	The probability that the impact will occur if the proposed project occurs; or conversely, reasonable assurance in keeping with the potential severity of an impact that the impact will not occur
3	Growth-inducing or growth-inhibiting aspects of the impact, including the relationship or contribution of the impact to cumulative impacts
4	The quantity and quality of each environmental resource or value that would be affected, including the uniqueness and fragility of those resources and values
5	The importance to the state and to society of each environmental resource or value that would be affected
6	Any precedent that would be set as a result of an impact of the proposed project that would commit FWP to future actions with significant impacts or a decision in principle about such future actions
7	Potential conflict with local, state, or federal laws, requirements, or formal plans

## XI. Private Property Impact Analysis (Takings)

The 54<sup>th</sup> Montana Legislature enacted the Private Property Assessment Act, now found at § 2-10-101. The intent was to establish an orderly and consistent process by which state agencies evaluate their proposed projects under the "Takings Clauses" of the United States and Montana Constitutions. The Takings Clause of the Fifth Amendment of the United States Constitution provides: "nor shall private property be taken for public use, without just compensation." Similarly, Article II, Section 29 of the Montana Constitution provides: "Private property shall not be taken or damaged for public use without just compensation..."

The Private Property Assessment Act applies to proposed agency projects pertaining to land or water management or to some other environmental matter that, if adopted and enforced without due process of law and just compensation, would constitute a deprivation of private property in violation of the United States or Montana Constitutions.

The Montana State Attorney General's Office has developed guidelines for use by state agencies to assess the impact of a proposed agency project on private property. The assessment process includes a careful review of all issues identified in the Attorney General's guidance document (Montana Department of Justice 1997). If the use of the guidelines and checklist indicates that a proposed agency project has taking or damaging implications, the agency must prepare an impact assessment in accordance with Section 5 of the Private Property Assessment Act.

**Table 4: Private Property Assessment Act (Taking and Damaging Assessment)**

PRIVATE PROPERTY ASSESMENT CHECKLIST			
Does the Proposed Action Have Takings Implications under the PPAA?	Question #	Yes	No
Does the project pertain to land or water management or environmental regulations affecting private property or water rights?	1	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Does the action result in either a permanent or an indefinite physical occupation of private property?	2	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Does the action deprive the owner of all economically viable uses of the property?	3	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Does the action require a property owner to dedicate a portion of property or to grant an easement? (If answer is NO, skip questions 4a and 4b and continue with question 5.)	4	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is there a reasonable, specific connection between the government requirement and legitimate state interest?	4a	<input type="checkbox"/>	<input type="checkbox"/>
Is the government requirement roughly proportional to the impact of the proposed use of the property?	4b	<input type="checkbox"/>	<input type="checkbox"/>
Does the action deny a fundamental attribute of ownership?	5	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Does the action have a severe impact of the value of the property?	6	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Does the action damage the property by causing some physical disturbance with respect to the property in excess of that sustained by the public general? (If the answer is NO, skip questions 7a-7c.)	7	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is the impact of government action direct, peculiar, and significant?	7a	<input type="checkbox"/>	<input type="checkbox"/>
Has the government action resulted in the property becoming practically inaccessible, waterlogged, or flooded?	7b	<input type="checkbox"/>	<input type="checkbox"/>
Has the government action diminished property values by more than 30% and necessitated the physical taking of adjacent property or property across a public way from the property in question?	7c	<input type="checkbox"/>	<input type="checkbox"/>
<b>Does the proposed action result in taking or damaging implications?</b>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
Taking or damaging implications exist if <b>YES</b> is checked in response to Question 1 and also to any one or more of the following questions: 2, 3, 4, 6, 7a, 7b, 7c; or if <b>NO</b> is checked in response to question 4a or 4b.			
If taking or damaging implications exist, the agency must comply with MCA § 2-10-105 of the PPAA, to include the preparation of a taking or damaging impact assessment. Normally, the preparation of an impact assessment will require consultation with agency legal staff.			
<b>Alternatives:</b> The analysis under the Private Property Assessment Act, §§ 2-10-101-112, MCA, indicates no impact. FWP does not plan to impose conditions that would restrict the regulated person's use of private property to constitute a taking.			

## XII. Public Participation

### Scoping

Ongoing local scoping activities for similar native WCT and population restoration projects have occurred historically. Because FWP determined the proposed action will result in limited environmental impact and little public interest has been expressed, FWP determined the proposed project did not meet the criteria for a public scoping meeting. Therefore, a public scoping meeting was not held for the proposed action. Scoping was held with the landowner. Several strategies were used to inform the public about and solicit comments on the proposed action. These strategies included:

- Press release
- Legal notice
- Distribution of a scoping letter

For the proposed project, scoping efforts included queries to the following affected agencies:

- Montana Natural Heritage Program
- US Department of the Interior
  - Fish and Wildlife Service
  - Bureau of Land Management



- US Department of Agriculture
  - Forest Service

Public notice announces the availability of the Draft EA for public review, summarizes the proposed project, identifies the period for public comment, and provides direction for submitting comments.

- **Duration of Public Comment Period:** The public comment period begins on the date of publication on FWP’s Public Notice website at <https://fwp.mt.gov/news/public-notices>. Written or e-mailed comments will be accepted until 5:00 p.m., Mountain Time, on the last day of public comment period, as listed below: **Length of Public Comment Period:** 30 days

**Public Comment Period Begins:** February 6, 2025

**Public Comment Period Ends:** March 8, 2025 at 5:00pm

Comments must be addressed to the FWP contact listed below.

- **Where to Mail or Email Comments on the Draft EA:**

**Name:** Travis Lohrenz

Email: [tlohrenz@mt.gov](mailto:tlohrenz@mt.gov)

Mailing Address:

Montana Fish, Wildlife & Parks

c/o Elk Creek WCT Restoration EA comments

#6 100 Prairie Way

Ennis, MT 59729

**Recommendation for Further Environmental Analysis:**

No further analysis is needed for the proposed action	<input checked="" type="checkbox"/>
FWP must conduct EIS level review for the proposed action	<input type="checkbox"/>

## XIII. EA Preparation and Review

	Name	Title
EA prepared by:	Travis Lohrenz	Region 3 Fisheries Technician
EA reviewed by:	Matt Jaeger	Regional Native Fish Program Manager
	Ryan Kreiner	Region 3 Native Fish Biologist
	Keith Wellstone	Region 3 Madison, Gallatin Fisheries Biologist
	Ben Rowe	MEPA Coordinator Legal Counsel

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