DRAFT

ENVIRONMENTAL ASSESSMENT

Westslope Cutthroat Trout and Arctic Grayling Restoration in Winslow Creek, Red Rock River Drainage

(FWP-CEA-FSH-R3-24-16)

March 21, 2024

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I. Compliance with the Montana Environmental Policy Act

Before a proposed *project* may be approved, environmental review must be conducted to identify and consider 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, 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 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 and Arctic Grayling Restoration in Winslow Creek, Red Rock River Drainage

Montana Fish Wildlife and Parks (FWP) proposes to restore and maintain native westslope cutthroat trout (WCT) and Arctic grayling in Winslow Creek. Winslow Creek is a tributary to the Red Rock River in the Centennial Valley in southwest Montana. Historically, WCT, Arctic grayling, and mountain whitefish were the only salmonid species in the Centennial Valley. In Winslow Creek, WCT were native and Arctic grayling likely used the stream seasonally. However, introductions of rainbow trout eliminated the conservation population of WCT through hybridization, and barriers to migration have eliminated access to the stream for grayling. Rocky Mountain sculpin *Cottus bondi* are also present in Winslow Creek. A conservation population is defined as viable

assemblage of WCT which have most recently tested genetically as ≥90% WCT. Within the conservation population designation, a core population is defined as containing <1% introgression from nonnative species.

The cutthroat trout (WCT, Yellowstone cutthroat trout) is Montana's state fish. 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 still widespread, WCT distribution and abundance in Montana has declined significantly in the past century due to introductions of nonnative 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 non-hybridized WCT are estimated to persist in less than 5% of formerly occupied habitat, and most remaining populations are restricted to isolated headwater habitats (Shepard et al. 2003; Shepard et al. 2005). Further, many of these remaining populations are at risk due to small population size, and most importantly, threats from competition, predation, and hybridization with non-native trout species.

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 addition, 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). 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, non-hybridized populations of WCT in place to conserve the remaining genetic diversity left on the landscape (i.e., WCT core populations). 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 Red Rock and Beaverhead rivers, 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 Red Rock River sub-basin, WCT historically occupied approximately 1,578 miles of tributary streams and rivers. Today there are a total of 31 remaining WCT populations in small headwater tributaries which occupy just over 184 miles of stream (11.7% of their historic range). Of these remaining 31 WCT populations, approximately 77% are at risk due to competition and hybridization with non-native fish. Data collected from streams in the Red Rock 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 Winslow 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).

Arctic grayling were widely distributed in the Upper Missouri River above Great Falls but have been reduced to approximately 5% of their historic range in Montana. Indigenous populations of WCT in Montana are currently limited to the Big Hole and Centennial Valley drainages of southwest Montana. The Centennial Valley population historically occupied Upper and Lower Red Rock lakes, Lima Reservoir, and Elk Lake and spawned in at least 14 tributaries (MAGW 2022). Currently most of the remaining grayling in the Centennial Valley reside in Upper Red Rock Lake and spawn in Red Rock River. This population has declined significantly in the past ten years due to poor overwinter conditions in Upper Red Rock Lake and is at risk of genetic and demographic extirpation (Warren et al. 2022).

Upper Missouri River grayling are listed as Species of Concern by the State of Montana and a Sensitive Species by the U.S. Bureau of Land Management (BLM) and the U.S. Forest Service (USFS). Though previously identified as a Candidate Species under the Endangered Species Act (ESA), in 2014 the U.S. Fish and Wildlife Service (USFWS) found that listing UMR grayling as threated or endangered was not warranted. This finding was confirmed in 2020 following legal challenge (USFWS 2020).

Winslow Creek is a tributary to the Red Rock River in the Centennial Valley. The fishery of Winslow Creek consists of rainbow x WCT hybrids and Rocky Mountain sculpin. Breneman Lake, in the headwaters of Winslow Creek, has historically been stocked with rainbow trout and Yellowstone cutthroat trout. Introductions of these nonnative trout have eliminated the WCT population in Winslow Creek through hybridization.

Figure 1. WCT would be stocked into Winslow Creek following a removal of hybrid trout.

FWP proposes to conserve WCT and Arctic grayling in Winslow Creek and expand their range in the drainage by removing hybridized trout upstream of a constructed fish barrier on an existing instream pond (Figure 2). The fish barrier is located on private land just upstream of the South Valley Road in the Centennial Valley at river mile 4.4. The non-native fish upstream of the fish barrier would be removed using rotenone, a naturally derived chemical from plants in the bean family that is highly effective at killing fish with few impacts to most non-target organisms. Rotenone acts by inhibiting oxygen transfer at the cellular level. It is especially effective on fish at low

concentrations because it is readily absorbed into the bloodstream through the gills. There is little risk to terrestrial and avian animals that consume rotenone treated waters or dead fish because rotenone is readily broken down by digestive processes and is not readily absorbed through the digestive system; therefore, terrestrial and avian animals can tolerate exposure to concentrations much higher than those used to kill fish. Rotenone does have temporary adverse impacts to aquatic invertebrates, particularly those that breath through gills. Multiple studies have shown, at the concentrations proposed for Winslow Creek, invertebrates recover within one year after treatment with rotenone. 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 would be administered by trained FWP personnel following requirements and guidance on the label, 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. The rotenone treatment of Winslow Creek would take 2-5 days and would be repeated in at least one consecutive year to ensure all fish were removed (Lampton et al. 2023).

To prevent rotenone from traveling downstream of the proposed treatment area and affecting fish in the Red Rock River, potassium permanganate ($KMnO_4$) would be applied to the stream to neutralize rotenone at the established fish barrier. Potassium permanganate is a strong oxidizer and quickly breaks down rotenone (Engstrom-Heg 1971, Engstrom-Heg 1976; see Direct Impacts to Water Quality Section p 18 for more information). There is minimal risk to terrestrial wildlife and humans that come in contact with rotenone treated waters; however, per rotenone label requirements, public access to the Winslow Creek drainage will be prohibited during the prescribed 2-5 day treatment period.

Figure 2. Lower pond on Winslow Creek with fish barrier marked with red X.

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 uses genetic methods to detect the DNA of organisms shed into the environment by sequentially filtering stream water collected throughout the treatment area. If fish are present, their DNA is collected on the filter and their location can be identified. This technique has proven effective at detecting even a single fish in an entire watershed (Carim et al. 2020). If eDNA sampling indicates that hybrid trout remain after two consecutive annual treatments, additional localized treatments would occur until it is confirmed that the stream is fishless upstream of the barrier.

Following removal of non-native fish, unaltered WCT from up to five neighboring populations would be used to repopulate the stream. Currently, there are 11 remaining core populations (<1% nonnative trout introgression) of WCT in the Beaverhead, Red Rock, and Ruby sub-basins that are at-risk (through hybridization or competition with brook trout) and cannot be protected in place. Winslow Creek WCT would be monitored over the next 5-10 years to determine their response to restoration. Experience from other projects indicates that salvaged WCT which are released back to the stream following nonnative trout removals will thrive and fill the available habitat within 3-6 years (Clancy et al 2019; Olsen 2020; Feuerstein 2022). Utilizing fish from multiple populations will reduce any negative genetic impacts associated with inbreeding (i.e., genetic bottleneck or founder effect) that may adversely affect the population's ability to repopulate.

In addition, Arctic grayling would be stocked from the Centennial Valley brood population into Winslow Creek following removal of non-native fish. Only grayling with a primary genetic ancestry from the Centennial Valley would be used as donor sources (Kovach 2022). The presence of two instream ponds increases the likelihood

that a grayling population in Winslow Creek would eventually become self-sustaining. Approximately 4,000-5,000 grayling fry would be stocked into the ponds for 3-5 years following removal of non-native fish.

The primary benefit of this project is the long-term conservation of at-risk WCT populations in the Upper Missouri River and the creation of a new conservation population of Centennial-origin grayling in Winslow Creek. The top priority for WCT conservation in southwest Montana is to protect all remaining at-risk populations of unaltered WCT (Jaeger et al. 2021). This includes replicating any populations which cannot be protected in place. There are currently eleven WCT populations in the Beaverhead, Red Rock, and Ruby river sub-basins which last tested ≥99% genetically unaltered and cannot be protected in place. Near the end of the removal project (2025), updated genetics will be collected, and a final list of donor streams will be created. Testing of potential donor streams for Aquatic Invasive Species and fish pathogens will be conducted and a permit to transfer fish would be obtained from Montana's Aquatic Health Advisory Committee (AHAC).

A conservation goal for Arctic grayling in southwest Montana is to establish new conservation populations of self-sustaining UMR grayling in historically occupied drainages. This project would expand the distribution of protected WCT and grayling by approximately six miles and would serve as a source for future introductions. Collectively, conservation projects like the one proposed for Winslow Creek are intended to secure a small amount of the overall fish-bearing habitat for WCT and grayling to ensure both 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 2023).

Figure 3. Unnamed tributary stream in upper Winslow Creek which will be treated with rotenone as part of the proposed Winslow Creek project.

Affected Area / Location of Proposed Project

- Legal Description
    - Latitude/Longitude: 44.59291, -111.96832
    - Section, Township, and Range: T14S R3W Sec 27,28,34,35; T15S R3W Sec1,2,3
    - Town/City, County, Montana: 8 miles west of Lakeview, Beaverhead County Montana

Location Map

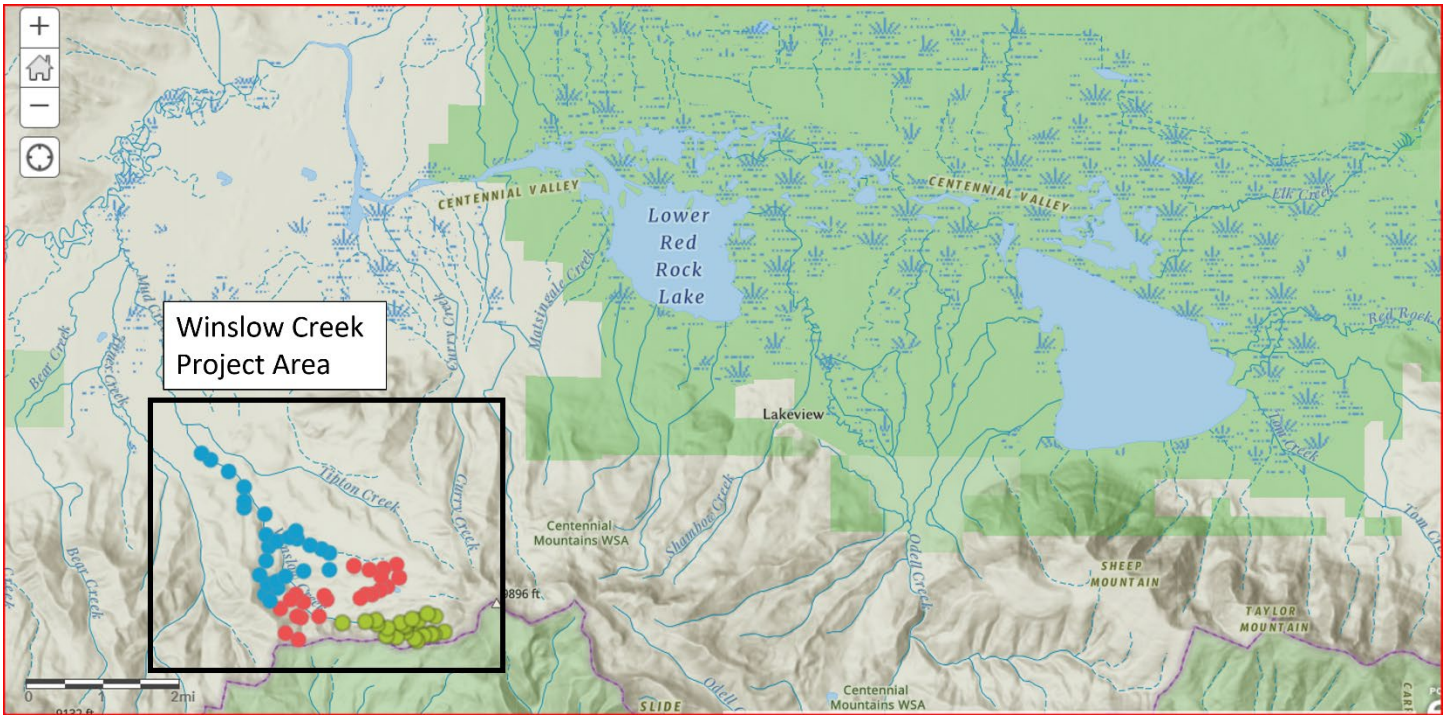

Figure 4. Map of Winslow Creek Project Area in the Centennial Valley. Dots represent drip-can locations separated by day (colors).

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 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 restore native WCT and Arctic grayling populations in Winslow Creek, a tributary of Red Rock River, by removing nonnative hybrid trout upstream of a constructed fish barrier. Since 2011, five populations of unaltered WCT have been extirpated from the Red Rock River drainage, and five other populations have been reduced to <99% genetic composition through hybridization. In the same time period, Centennial Valley Arctic grayling have declined from 2,500 spawning adults in 2012 to <100 in 2022. Both species require conservation intervention to ensure their long-term persistence.

Benefits of the proposed project include the following:

- Ensure continued survival of WCT and Arctic grayling in the Red Rock River drainage (i.e., Winslow Creek)
- Conserve remaining genetic diversity in the affected WCT and Arctic grayling populations.
- Meet Montana's statutory obligation to prevent listing of WCT and Arctic grayling 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)
    - Memorandum of Understanding Concerning Arctic Grayling (2007)
    - WCT Conservation Strategy for the Missouri Headwaters of Southwest Montana (2022)
    - Upper Missouri River Arctic Grayling Conservation Strategy (2022)

Montana Statewide Fisheries Program and Guide (2023).	Yes*	No
Was a cost/benefit analysis prepared for the proposed project?	☐	☒

* If yes, a copy of the cost/benefit analysis prepared for the proposed project is included in Attachment A to this Draft EA

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
USDA Forest Service	Pesticide (Piscicide) Use Permit	Allow the application of pesticides on FS lands
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

Are enforceable controls limiting potential impacts of the proposed action? If not, no further evaluation is needed.			**Yes ☒**	**No ☐**
If yes, are these controls being relied upon to limit impacts below the level of significance? If yes, list the enforceable control(s) below			**Yes ☒**	**No ☐**
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 project area.	
CFT Legumine Label	MT Dept of Agriculture, US Environmental	The Montana Pesticides Act (MPA), Title 80, Chapter 8, Sections	Regulates safety procedures, application rates and neutralization of rotenone application.	

	Protection Agency	80-8-101 through 80- 8-405, MCA, 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 int the Upper Missouri River drainage to 20% of their historically occupied habitat. Specifies a management goal to expand distribution of Arctic grayling 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.
Memorandum of Understanding Concerning Arctic Grayling	FWP, BLM, USFWS, USFS, TU, AFS, Yellowstone NP, AGRP, NRCS, DNRC	Memorandum of Understanding	Commitment of agencies and resources towards the conservation of UMR Arctic grayling.
Upper Missouri River Arctic Grayling Conservation Strategy	FWP	Conservation Strategy	Identifies management goals to ensure the species' long-term self-sustaining persistence. In the Centennial Valley, a goal is to preserve the existing genetic diversity through the creation of additional populations which will serve as genetic reserves.
Pesticide Use Permit	USFS	Permit	Stipulates all personnel will either be registered as operators under this license or will be licensed applicators. b) Standard Personal Protective Equipment and appropriate signing will be used (label requirements). c) Project will be coordinated with the Beaverhead-Deerlodge National Forest

			d) National BMP's for Water Quality Management on NFS Lands will be implemented. Applicators and operators will adhere to FWP's Piscicide Use Policy and all product label requirements. e) Monitoring will be conducted using sentinel fish to determine the effectiveness of treatments and to ensure that rotenone is degraded to less than lethal concentration. A colorimeter will be used to measure the residual neutralizing agent below the neutralization station.
Pesticide Discharge Permit	DEQ	Permit	Regulates pesticide application to 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, 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 and Arctic grayling would not be protected in Winslow Creek. Many of the remaining 11 at-risk core (≥99%) populations of WCT in the Beaverhead, Ruby, and Red Rock drainages would be lost to hybridization or competition with nonnative species and FWP would pursue a similar project in a different drainage.

Loss of additional core WCT populations would adversely impact the State's obligation to conserve native fish and may contribute to potential future listing of the affected species under the ESA. Although there is limited angling that occurs in Winslow 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 Winslow Creek as a possible new conservation population of UMR Arctic grayling into historically occupied drainages, which is a stated goal in the UMR Arctic Grayling Conservation Strategy (2022). Winslow Creek would not serve as a potential source for future introductions or genetic rescue for either species.

Alternative 2: Proposed Project

FWP proposes to restore and protect WCT and protect Arctic grayling in Winslow Creek by removing nonnative hybrid trout upstream of the fish barrier using the piscicide rotenone. FWP would salvage nonhybridized WCT from up to five neighboring populations that cannot be protected in place. FWP would also repopulate Winslow Creek with Arctic grayling of Centennial Valley genetic ancestry which would serve as a future source for reintroductions and genetic rescue. 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?	☒	☐

* 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 hybrid trout from the Winslow Creek.

Alternative 3 would attempt to protect native WCT and Arctic grayling in Winslow Creek by removing hybrid trout with electrofishing rather than rotenone. Multiple-pass electrofishing has been used to eradicate nonnative trout from several small streams in northcentral and in 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, 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 an 18-year period 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 the type of habitat and fish size distribution. Further, electrofishing removal is very 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 generally requires a crew of 3 to 9 people and would likely occur over at least 10 years. Most commonly in the Upper Missouri River basin, mechanical removals require years of suppression, and while they may significantly reduce the density of nonnative trout, ultimately the nonnative population rebounds and a chemical treatment is required (e.g., Dutchman Creek, McVey Creek). Removing hybrid trout from Winslow Creek with electrofishing would likely be unsuccessful because of the length of stream currently occupied by fish (6 miles total) and the complexity of the habitat. Such an effort would be impractical and likely would not achieve the intended result, as it is uncertain if 100% removal of non-native trout could be achieved with electrofishing given the length of the stream and the complexity of the habitat in Winslow Creek. Non-native fish would also need to be removed from the two instream ponds with gill netting, which is ineffective at capturing small fish and unlikely to result in complete eradication. Because mechanical removal (electrofishing, gill netting) would be impractical and likely would not achieve the intended result (complete elimination of hybrid trout), such an alternative is not reasonable for the purposes of the proposed action. Therefore, Alternative 3, Mechanically Remove Hybrid Trout from Winslow 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 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 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 Centennial Valley include small and large mammals, birds, reptiles, amphibians, and fish. The Centennial 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 Centennial 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 Winslow Creek drainage are typical of those found throughout Red Rock River sub-basin. The Winslow Fire burned most of the southern slopes of the upper drainage in 2003. The middle drainage is a mix of lodgepole pine, Engelmann spruce, and willows. As the creek enters the valley on the lower end, willows and sagebrush are the primary riparian feature. The Winslow Creek drainage is classified as 36% Recently Burned, 19% Sagebrush Steppe, 17% Wetland/Riparian, 14% Forest, 9% Grassland, and 1% Human Land-Use.

The aquatic habitat consists primarily of moderate gradient Rosgen "B" type stream channel dominated by boulders and large cobble substrates. The fishery in Winslow Creek is dominated by hybrid rainbow x cutthroat 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 Winslow Creek and its tributaries during project implementation. The treatment of Winslow Creek with rotenone would be performed by as many as 15 FWP, BLM, USFS, and other partner 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 Winslow 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 Winslow Creek for a single day (less than 8 hours) 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 fish killing concentrations because, unlike fish which are exposed to rotenone through their gills, terrestrial wildlife exposure occurs only through consuming 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 a 24 hour period 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 a 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 g *1.08 µg/g or 37 µg of rotenone. This value is below the estimated median lethal equivalent concentration adjusted for body weight (30,400 µg). If fish were available for consumption by mammals scavenging along the shoreline for dead or dying fish, it is extremely unlikely that piscivorous mammals will consume enough fish to result in observable acute toxicity. Any direct impacts to mammals would be short-term and negligible.

Birds:

Similar results determined 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 it is possible that 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 hybrid rainbow x WCT in Winslow Creek upstream of the fish barrier to restore native WCT and Arctic grayling. Adverse project impacts would be minor because hybridized cutthroat and rainbow trout are common throughout the Red Rock 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 Winslow Creek drainage is in Breneman Lake for stocked WCT from the state's brood source (origin: west of the continental divide). The genetic composition of Winslow Creek has remained unchanged since 1994, despite illegal introductions of rainbow trout into Breneman Lake over that time. This indicates that stocked fish do not readily escape Breneman Lake and move into Winslow Creek. However, in order to prevent hybridization with WCT from outside the Missouri River Basin, only sterile trout would be stocked into Breneman Lake in the future. Growth of sterile trout in high-elevation lakes such as Breneman Lake (8,000 ft) will not be affected by this change, although catchability of stocked trout may improve (Knotek et al. 2017). Therefore, the fishery at Breneman Lake will remain unchanged. The loss of the fishery in Winslow Creek will be temporary because WCT would repopulate the available habitat and provide a recreational fishery similar to the current fishery. The impacts to WCT will be long-term and beneficial (Statewide Fisheries Management Plan, FWP 2023).

Rocky Mountain sculpin are also present in the Winslow 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, we anticipate that many sculpin will survive the rotenone treatments. However, if subsequent surveys in Winslow Creek fail to detect sculpin, fish will be captured below the fish barrier or in an adjacent stream and released upstream. Any direct impacts to Rocky Mountain sculpin are anticipated to be short term and minor and can be 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 one 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 to invertebrate richness and abundance. Conversely, lower rotenone concentrations (<50 ppb as is proposed in Winslow Creek) and treatments less than 8 hours (4 hours proposed in Winslow Creek), resulted in less impact to 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, recolonization would include aerially dispersing invertebrates from downstream areas (i.e. mayflies, caddis, stoneflies). Therefore, the possibility of eliminating a rare or endangered species of aquatic invertebrates by treating with rotenone in is unlikely. Further, the Montana Natural Heritage Program lists no aquatic invertebrate species of concern or potential species of concern in Winslow Creek. Based on these studies, FWP would expect the aquatic invertebrate species composition and abundance to return to pre-treatment diversity and abundance within one to two years after treatment. Therefore, any adverse impacts to aquatic invertebrate communities would be short-term and minor to moderate.

The fire that occurred in the Winslow Creek drainage in 2003 was a large disturbance that likely caused shifts in the abundance and diversity of the aquatic invertebrate community. However, this community has had adequate time to rebound and now is likely representative of the natural community which existed prior to the fire. Aquatic invertebrates quickly repopulate vacant streams because of their ability to disperse terrestrially as adults. Any direct impacts to aquatic invertebrates from this treatment would similarly be short-term and minor to moderate.

Amphibians and Reptiles:

Amphibians and reptiles potentially found within the proposed treatment area include: western tiger salamanders (*Ambystoma mavortium*), Columbia spotted frogs (*Rana luteiventris*), western toads (*Bufo boreas*) (amphibians), western terrestrial garter (*Thamnophis elegans*), common garter (*T. sirtalis*), and rubber boa (*Charina bottae*) snakes. Rotenone can be toxic to gill-breathing larval amphibians, though air breathing adults are less sensitive. Reptiles would not be directly affected by the rotenone treatment because they are highly resistant to rotenone at fish killing concentrations. 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, Columbia spotted frogs and western toads have been documented in Winslow Creek. The Columbia spotted frog is a native species considered *stable* within Montana and the affected area, though it may be quite rare in parts of its range, and/or suspected to be declining. 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 because of the low sensitivity of adults to rotenone, and because reproductive habitats will not be targeted for treatment as they generally lack fish. Spotted frogs and toads generally seek out shallow lentic areas for reproduction. Such habitats exist in two instream ponds in Winslow Creek, but adult frogs and toads would not be affected by the stream treatment. On a recent rotenone treatment in Selway Creek (Red Rock 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.

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 Winslow Creek. Mink, blue heron, king fisher, and other potential piscivorous mammals and birds may be displaced for up to 2 years while there are no fish in the affected 5-mile section of Winslow Creek. Any adverse impacts would be minor because no mammal species present in the Winslow 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, Red Rock lakes, Red Rock River, and Breneman Lake. Therefore, any impacts to these species would be limited to temporary displacement until WCT repopulate 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 Winslow 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 that prey on these 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 reptiles are not aquatic invertebrate obligates, relying also on terrestrial invertebrates for food. Therefore, any adverse secondary impacts would be short-term and minor.

Cumulative Impacts

No significant adverse cumulative impacts would be expected because of the proposed project. Cumulative impacts from the proposed project would include substantial benefits for WCT and Arctic grayling 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 Red Rock River that would equate to 315 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 Winslow Creek will be utilized to preserve up to five populations of non-hybridized WCT from neighboring streams which cannot be protected in place. When combined with similar projects performed in the Red Rock drainage and its existing WCT populations, once the Winslow Creek project is complete, WCT will occupy 226 miles of stream (70%) of the native WCT restoration goal (315 miles). Further, the proposed project would mitigate against the potential for future federal ESA-listing of WCT, as required by § 87-5-107, MCA.

Arctic grayling would benefit from the proposed project through the establishment of a new, self-sustaining population which harbors much of the Centennial Valley's genetic legacy. Sources used to establish a grayling population following a rotenone treatment will consist of populations which were originally founded with CV Arctic grayling and which was recently confirmed through genetic testing (Kovach 2022).

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

2. Water Quality, Quantity, and Distribution

Existing Environment/No Action Alternative

Winslow Creek is a relatively pristine basin with no known water quality impairments. Much of the drainage burned in 2003 which likely resulted in increases in fine sediment. Cattle grazing does occur in the drainage, but significant impacts from this activity have not been observed. There is one irrigation diversion on Winslow Creek near the bottom of the proposed project area that irrigates private property north of the project area. Rotenone will be deactivated using Potassium Permanganate in both the ditch and below the project area on Winslow Creek.

Direct Impacts

No significant adverse direct impacts would be expected because of the proposed project. The proposed action would intentionally introduce the pesticide rotenone to surface water to completely remove non-native hybrid trout from the affected section of Winslow Creek. CFT Legumine (5% rotenone) is an EPA registered pesticide and is deemed safe to use for 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 Engsrtom-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 with 24-48 hours.

In addition to natural methods of breakdown, rotenone is rapidly neutralized through application of the oxidizing agent, potassium permanganate (KMnO4), which is the only chemical allowed for deactivating rotenone by law and is applied in granular form or as a 2.5% solution (1 pound KMnO4 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 KMnO4 are minimized through the oxidation of organic components and rotenone. Detoxification is accomplished after about 15-30 minutes of exposure time between the two compounds. As rotenone treated water leaves the project area (i.e., fish barrier), KMn04 is applied to the stream at a rate such that the residual value measured 30-minutes below remains at 0.5-1.0 ppm. When rotenone at the project barrier begins to decrease, KMn04 application rates are decreased until sentinel fish at the barrier survive for four hours and KMn04 is no longer needed.

Detoxification would be used in Winslow Creek at both fish barriers (i.e., Winslow Creek and the irrigation ditch) to prevent any treated waters from traveling downstream and affecting fish outside of the treatment area. Rotenone neutralization would commence according to FWP Rotenone Deactivation Procedures found in the FWP Piscicide Policy which states that detoxification with KMnO4 will begin no less than 2 hours before the theoretical arrival time of treated waters at the detoxification station. Therefore, KMnO4 application would begin no less than 2 hours before any rotenone treated waters would be present 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 the detoxification of rotenone in the stream would be measured in two ways: first, sentinel fish would be placed in the stream 30 minutes of water travel-time downstream of the fish barrier; second, residual KMnO4 levels would be measured at the 30-minute downstream location with a handheld meter. A minimum of 0.5-1.0 ppm KMnO4 residual at 30 minutes is required to fully neutralize rotenone. After the rotenone is applied, FWP would expect the rotenone to pass through the Treatment Area within a 24 to 48-hour time period and be completely broken down by KMnO4 at the Deactivation Station. Residual values of KMn04 and rotenone in the stream will be undetectable at that point. Any adverse direct impacts would be short-term, mitigated by the use of KMnO4, and minor.

Secondary Impacts

No significant adverse secondary impacts would be expected because of the proposed project. Dead fish (hybrid trout and some 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 is attributed to the input of phosphorus to the water from decaying fish. Bradbury 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. Block nets will be placed on Winslow Creek above both instream ponds to prevent excess fish from accumulating in the ponds. Dead fish in the ponds will be removed using dip nets as fish may surface depending on water temperature (Parker 1970). 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 Winslow Creek drainage.

3. Geology

Existing Environment/No Action Alternative

The Centennial Mountains are 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). The southside of the Centennial Valley contains an active fault system, and warm water springs are common (5°C above background temperature).

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 hybrid trout to protect native WCT and grayling would 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 Winslow Creek drainage. FWP has not previously treated the affected section of Winslow Creek with rotenone. However, if the initial rotenone treatment is unsuccessful in eradicating the hybrid trout population from the affected stretch of Winslow Creek, additional treatment may be deemed necessary. If additional treatment with rotenone is deemed necessary, no impacts to geology of the affected area would be expected.

4. Soil Quality, Stability, and Moisture

Existing Environment/No Action Alternative

Soils in the Centennial Valley 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 hybrid trout to conserve native WCT and grayling in the affected section of Winslow 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 Winslow Creek drainage. FWP has not previously treated the affected section of Winslow Creek with rotenone. However, if the initial rotenone treatment is unsuccessful in eradicating the hybrid trout population from the affected stretch of Winslow 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

Prior to the Winslow Creek fire in 2003, the Winslow Creek drainage was heavily forested with primarily lodgepole pine, Engelman spruce, and subalpine fir at higher elevations. The 2003 fires burned through much of the drainage and most of the southern slopes now contain only dead trees and native grasses. The riparian areas in upper Winslow Creek were denuded of larger woody vegetation, but lower Winslow Creek contains a healthy population of willows. The Winslow Creek drainage can be classified as 36% recently burned, 19% Sagebrush Steppe, 17% wetland and riparian, 14% Forest, 9% grassland, and 1% human land use. Six sensitive plant species are also potentially present in the Winslow Creek drainage (alkali-marsh ragwort (s3), Lemmon's alkaligrass (s1s2), mealy primrose (s3), whitebark pine (s3), slender thelypody (s2), and dwarf goldenweed (sH). 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 Winslow Creek and its tributaries to conduct the work necessary for the proposed project. The rotenone treatment of Winslow 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 trampling of plants.

Six sensitive plant species are present in the Centennial Valley and may exist in the Winslow Creek drainage, although no documented occurrences exist (alkali-marsh ragwort, Lemmon's alkaligrass, mealy primrose, whitebark pine, slender thelypody, and dwarf goldenweed). Three of these species are considered Species of Concern; however, none of these identified species are likely to be present in the riparian area where most foot traffic would occur to accommodate the proposed project. Lemmon's alkaligrass is rare in Montana and primarily found in the Centennial Valley bottom, Slender thelypody

similarly exists in valley bottoms, and Whitebark Pine, which is listed as threatened under the ESA, exists on high-elevation ridges which would not be impacted. 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 Winslow Creek drainage but at a low intensity.

FWP would adhere to all applicable requirements related to 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 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 Winslow 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 Winslow Creek drainage include steep mountain forests with small, fast flowing streams. The fire in 2003 significantly changed the aesthetics of the drainage, and approximately 36% of the drainage is classified as recently burned (see Existing Environment/No Action Alternative for Terrestrial, Avian, and Aquatic Life and Habitats above). Cattle 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, which some persons may find aesthetically adverse. The dead fish may also cause objectionable odors. Most of the dead fish will naturally sink and decay, and complete decomposition is expected in 1-2 weeks. To prevent build-up of dead fish in ponds, block nets will be placed above each instream pond, and any dead fish remaining on the surface of the ponds after the

project will be removed with dip nets. 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 and grayling in the affected section of Winslow 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 Winslow 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 significant adverse cumulative impacts would be expected. FWP is unaware of any other past, present, or future related state projects that would impact 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 typically limited to foot or horse traffic at Breneman Lake, which is upstream of the treatment area. The upper sections of Winslow Creek are on BLM administered land and will be closed to the public. Lower Winslow Creek is on private land, and the landowners are supportive and aware of this project. Therefore, public traffic would be reduced or eliminated when project related traffic is occurring. 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 hybrid trout to conserve native WCT and grayling in the affected section of Winslow 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 Winslow 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 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 Winslow 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, Arctic grayling (*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*).*

Six sensitive plant species, including three *species of concern* are also potentially present in the Winslow Creek drainage (alkali-marsh ragwort, Lemmon's alkaligrass, mealy primrose, whitebark pine, slender thelypody, and dwarf goldenweed; however, these plant species are generally found in valley bottoms or high-elevation ridges. Therefore, none of the identified plant *species of concern* are likely to be present in the riparian area affected by the proposed project. A fire that occurred in the Winslow Creek drainage in 2003 significantly affected the habitat for all species found, or potentially found, in the Winslow Creek drainage, including those species listed as *threatened* under the federal ESA and/or *species of concern*, as listed above. The landscape and biota continue to recover from the effects of the fire; therefore, ongoing limited impacts associated with the fire would continue for all species that inhabit the affected area. Westslope cutthroat trout were historically present in Winslow Creek until introductions of rainbow trout eliminated this population through hybridization.

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 Winslow 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 Winslow 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 Centennial Mountains, 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 actually 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 also potentially locate 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 (bird) 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 Winslow Creek for a period of 1-2 years, until WCT and grayling have repopulated the creek.

No machinery, helicopters or other heavy equipment would be used to implement the project. Therefore, to some degree, 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 Winslow Creek drainage will be accessed on foot during the proposed treatment.

Vegetation Life:

Six sensitive plant species including three species of concern are also potentially present in the Winslow Creek drainage (alkali-marsh ragwort, Lemmon's alkaligrass, mealy primrose, whitebark pine, slender thelypody, and dwarf goldenweed). However, none of these identified species are likely to be present in the riparian area affected by the proposed project. Therefore, the presence of project personnel and associated trampling of riparian vegetation would not be expected to adversely impact any of the identified plant *species of concern*.

Aquatic Life:

WCT are considered a *sensitive species* and a *species of concern*. The intent of the proposed project is to restore native WCT to Winslow Creek by removing hybrid trout and repopulating the stream with aboriginal populations of WCT. The resulting population would be secured in greater than six miles of habitat. Therefore, it is anticipated any direct impacts to WCT in the affected area would be long-term, moderate, and beneficial.

Arctic grayling is a *species of concern* in Montana. The species was petitioned for listing under the federal ESA and was deemed by the USFWS a candidate species for several years. In 2020, the USFWS determined that listing the Arctic grayling was not warranted at that time; however, a lawsuit was filed shortly thereafter, objecting to the USFWS decision to not list the Arctic grayling. At the time of this Draft EA, the USFWS decision to not list Arctic grayling under the ESA is under appeal.

Prior to anthropogenic alterations of the Centennial Valley, grayling were widespread and used most sizeable tributaries for spawning, rearing, and possibly thermal refuge. It is likely that grayling did access Winslow Creek seasonally, but irrigation diversions now restrict movement and grayling are not present. Following removal, grayling will be introduced into the project area above the barrier and are likely to become established in the pond and low-gradient stream habitat. Therefore, any impacts to grayling because of the proposed project would be long-term, moderate, and beneficial.

Western toads constitute a *species of concern* and may be present in the Winslow 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 including western toads because larval amphibians respire through their skin and gills. Western toads select lentic waters for reproduction and the rearing of tadpoles and may utilize instream ponds in Winslow Creek. 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 and grayling introduced to Winslow Creek may prey upon western toad tadpoles, but no more than the established population of hybrid trout.

Therefore, it is expected any adverse impacts to western toads because of the proposed project would be long-term and negligible.

FWP would adhere to all applicable requirements related to 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 restoration of WCT and Arctic grayling to Winslow Creek would benefit both species and, for the purposes of other affected species, 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. For the purposes of MEPA, *cumulative impact* 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."

Cumulatively, the proposed project would benefit historic and ongoing WCT and Arctic grayling conservation efforts in the Centennial Valley, which would help 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 (grizzly bear, Canada lynx, wolverine) 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 related actions in the Red Rock River drainage, once the proposed project is completed WCT will occupy 226 miles of stream or 70% of the restoration goal. Collectively, WCT conservation projects like the one proposed for Winslow 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 Centennial Valley, and more specifically the Red Rock River drainage, would be long-term, moderate to major, and beneficial.

Under the proposed project, a new conservation population of Arctic grayling would also be established in the Centennial Valley thereby further supporting ongoing efforts to preserve the species. Because the affected grayling population constitutes the last remaining adfluvial grayling population in the lower 48 states, any cumulative impacts associated with the establishment of a new conservation population would be long-term, moderate to major, and beneficial.

FWP has not previously treated the affected section of Winslow Creek with rotenone. However, if the initial rotenone treatments are 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 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 Winslow Creek drainage include evidence of use by Native Americans and early European settlers. Man-made ponds and other 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 the potential for vegetation trampling by project personnel and possible minor modifications to existing ponds and ditches. 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 hybrid trout to conserve native WCT and grayling in the affected section of Winslow 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 Winslow 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 or the resulting future WCT and Arctic grayling stocking activities. 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 irrigation.

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 hybrid trout to conserve native WCT and Arctic grayling, and to establish conservation populations for both species, in the affected section of Winslow Creek will not result in any changes to current water use for irrigation or other purposes. 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. In fact, 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.

Indigenous Arctic grayling in the lower 48 states currently exist only in the Centennial and Big Hole valleys of southwest Montana. Grayling are a rare and unique species in Montana, and are treasured by anglers and conservation groups.

Direct Impacts

No significant adverse direct impacts would be expected because of the proposed project. The restoration of WCT and Arctic grayling to Winslow 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 who enjoy fishing for and otherwise appreciate native species on the landscape. Any adverse direct impacts associated with the elimination of hybrid trout from the affected section of the stream (i.e., loss of hybrid trout fishing opportunities in Winslow Creek) would be mitigated by other nearby opportunities to fish for these nonnative fish species during and following the proposed project. Nearby fisheries in Breneman Lake and Red Rock River receive greater angling pressure than Winslow Creek, and hybrid trout populations in these connected waterbodies would remain intact.

The intent of the proposed project is to conserve and restore native WCT and Arctic grayling by eliminating hybridization and competition from hybrid trout. Therefore, the proposed project would create a unique native fishery that would directly benefit any person who enjoys fishing for native WCT and/or native Arctic grayling or otherwise values these 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 hybrid trout to conserve native WCT and Arctic grayling in the affected section of Winslow 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 and Arctic grayling. Therefore, because the proposed project would create a unique native fishery and improve both species' distributions, 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 and Arctic grayling conservation populations would result in a reduction in the remaining range of both native species and could contribute to their listing as threatened or endangered species under the ESA. Listing under the ESA would drastically change state management of the species and likely limit public opportunity to fish for and otherwise interact with and enjoy these native fish species in Winslow Creek. It is also possible that WCT from donor streams used to repopulate Winslow Creek would become locally extinct (extirpated) without this project, thereby forever altering this valued species.

Any secondary impacts associated with the elimination of the hybrid trout fishery from the affected section of the Winslow Creek would be mitigated by other opportunities to fish for hybrid 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 Winslow 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.

Further, Montana's existing WCT and Arctic grayling conservation plans intend to restore WCT to 20% of their historic range and to maintain genetically pure populations of both species. The loss of WCT and Arctic grayling conservation populations would result in a reduction in the remaining range of both native 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 in Winslow Creek. It is also possible that WCT from donor streams used to repopulate Winslow Creek would become locally extinct (extirpated) without this project, thereby forever altering this valued 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 and the Centennial Mountains Wilderness Study Area administered by the BLM. The headwaters of the Winslow Creek drainage and its relatively remote and natural setting would remain a desired public resource. 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 hybrid trout to conserve native WCT and Arctic grayling in the affected section of Winslow 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 Winslow 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.

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 Winslow Creek drainage. Upper Winslow Creek is located on public lands managed by the BLM and is accessible to seasonal recreation opportunities including hiking, horseback riding, fishing, hunting, trapping, and wildlife viewing. Access to these activities would not be changed because of the proposed project. The possibility of catching or otherwise enjoying the existence of native WCT or Arctic grayling in Winslow Creek would not be realized under the No Action Alternative.

Direct Impacts

No significant adverse direct impacts would be expected because of the proposed project. There would be a temporary loss of angling opportunity in the upper 5-mile stretch of Winslow Creek during project implementation. However, closure of Winslow Creek to accommodate project implementation would be short-term and temporary. The upper end of Winslow Creek is accessible to the public and lies on public lands administered by the BLM, and access would be restricted during project implementation. The lower half of Winslow Creek would not be closed during or after project implementation and is located on private property where access is gained only through landowner permission.

Further, numerous nearby opportunities to fish for nonnative hybrid trout would offset any adverse impacts realized by removal of such species from the upper 5-mile stretch of the Winslow Creek drainage. Winslow Creek is relatively small and angling pressure is limited. Breneman Lake accounts for most of the angling pressure and would remain unchanged and open to public access during project implementation. Multiple nearby streams of similar size, and with similar fisheries to the existing Winslow Creek fishery, exist within 10 miles of Winslow Creek. These streams provide ample opportunities to angle for nonnative 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.

Access to the Winslow Creek drainage would be restricted during and for a period of 2-5 days after rotenone treatment to prevent human exposure to rotenone (see below). This would not restrict access to Breneman Lake. Access restrictions would adversely impact those wishing to recreate in the area during project implementation. Limited primitive camping opportunities exist upstream of the fish barrier, and a well-used trailhead exists at the end of the Winslow Creek Road which provides public access to several trails and mountain lakes in the affected area. Such impacts would be mitigated by timing the project such that affected roads are not closed during popular recreation time, such as holidays and weekends, and maintaining access to adjacent drainages that provide similar recreational opportunities during the 2-5 days of the treatment each year until project objectives are achieved.

Secondary Impacts

No significant adverse secondary impacts would be expected because of the proposed project. Only the upper half of Winslow Creek is accessible to the public. People who recreate on upper Winslow Creek may view the loss of the existing nonnative hybrid trout fishery as an adverse impact, but current

angling pressure on the affected upper 5-mile stretch of Winslow Creek is minimal. Angler pressure is greater in Breneman Lake, which is connected to upper Winslow Creek, and this fishery would remain unchanged. Archery Hunters who access the headwaters would largely be unaffected as most of the activity associated with this project will be in riparian zones near the creeks. Impacts to archery hunters could be entirely avoided if the treatment were completed prior to the start of Montana's archery season (September 2), which is a goal for the proposed project. Once native WCT and Arctic grayling are re-established in the affected upper 5-mile stretch of Winslow Creek, it would be expected these native species would provide the same or improved angling opportunities as the existing non-native hybrid trout fishery provides today.

The long-term goal for WCT and Arctic grayling 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 both species. Mainstem rivers, such as the Red Rock River, support important non-native recreation fisheries (i.e., brown, brook, and rainbow trout) and are not part of the WCT or Arctic grayling 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 such as brook, rainbow, and brown trout.

In the Red Rock River drainage, WCT historically occupied approximately 1,638 miles of streams and rivers (1,578 miles of tributary habitat). Today there are a total of 31 remaining WCT populations (including slightly (>90%) hybridized WCT) in small headwater tributaries which occupy just over 184 miles of stream (11.7% of their historic range). Of these 31 WCT populations, 77% are at risk due to competition and hybridization with non-native fish. Data collected from streams in the Red Rock River drainage since 2011 indicate that five populations of unaltered fish have been completely lost, five additional populations have become hybridized to <99%, and one population which was greater than 90% WCT was lost as well.

Further, Arctic grayling were once widely distributed in the Upper Missouri River above Great Falls but have been reduced to approximately 5% of their historic range in Montana. Indigenous populations of Arctic grayling in Montana are currently limited to the Big Hole and Centennial Valley drainages of southwest Montana. The Centennial Valley population historically occupied Upper and Lower Red Rock lakes, Lima Reservoir, and Elk Lake and spawned in at least 14 tributaries (MAGW 2022). Currently most of the remaining Arctic grayling in the Centennial Valley reside in Upper Red Rock Lake and spawn in Red Rock River. This population has declined significantly in the past ten years due to poor overwinter conditions in Upper Red Rock Lake and is at risk of genetic and demographic extirpation (Warren et al. 2022).

Upper Missouri River Arctic grayling are listed as Species of Concern by the State of Montana and a Sensitive Species by the U.S. Bureau of Land Management (BLM) and the U.S. Forest Service (USFS). Though previously identified as a Candidate Species under the Endangered Species Act (ESA), in 2014 the U.S. Fish and Wildlife Service (USFWS) found that listing UMR grayling as threated or endangered was not warranted. This finding was confirmed in 2020 following legal challenge (USFWS 2020).

Projects that restore WCT and Arctic grayling, such as that proposed for Winslow Creek, are necessary to ensure the continued survival of these native species, conserve remaining genetic diversity, meet statutory obligations to prevent listing under the ESA, and preserve angling opportunities for these native species. The proposed project would restore and protect (as conservation populations) both native WCT and Arctic grayling 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 Winslow Creek with rotenone. However, if the initial rotenone treatments are unsuccessful in eradicating the hybrid 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 Winslow Creek drainage lies within the Centennial Mountains Wilderness Study Area administered by the BLM, which constitute federally administered public lands that are not subject to any local or state taxes. The lower drainage is 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 that enjoy fishing for non-native hybrid trout populations, or, conversely, beneficially impact those that prefer to fish for native WCT and Arctic grayling in Winslow Creek. 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 Winslow Creek, and many other nearby opportunities exist to fish for or otherwise enjoy recreational opportunities associated with either non-native hybrid trout or the restored native WCT and Arctic grayling 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 Winslow 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 which occur in the Winslow Creek drainage. The primary commercial, agricultural activities in the Centennial Valley, including the Winslow Creek drainage, constitute cattle and cattle grazing operations. Outfitting occurs for fishing and hunting throughout most of the Centennial Valley including in the Breneman Lake area at the headwaters of Winslow Creek. 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 and Breneman Lake will remain intact. Private landowners with grazing and irrigation rights in Winslow 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 hybrid trout to conserve native WCT and Arctic grayling in the affected section of Winslow Creek will not result in any direct impact to commercial, industrial, or agricultural activities and/or production. While rotenone is actively in the stream, cattle will be temporarily excluded from accessing Winslow 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 hybrid trout to conserve native WCT and Arctic grayling in the affected section of Winslow Creek will not result in any impact to commercial agricultural activities and production in the Centennial Valley. However, the elimination of nonnative hybrid trout and restoration of native WCT and Arctic grayling may adversely or beneficially impact fishing outfitters working in the Centennial Valley. More specifically, any fishing outfitters that provide services on the affected 5-mile stretch of Winslow Creek may realize benefit from increased services for those that prefer native WCT and Arctic grayling. The same fishing outfitters may realize adverse impacts from decreased services for those that prefer nonnative hybrid trout. Because the proposed project would impact a relatively small section of Winslow Creek and numerous other opportunities to fish for the affected native and nonnative 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 Winslow 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.

When combined with other native WCT and Arctic grayling conservation projects some beneficial impacts to existing agricultural activities would be expected as a result of the proposed action. Many streams located on BLM land, which also support existing native WCT populations, have stipulations regarding grazing and logging to specifically protect WCT from potential adverse impacts associated with such activities. As WCT are conserved through projects such as the Winslow Creek WCT restoration project, these regulations could become obsolete and ultimately removed. Currently non-native fish pose the greatest risk to WCT conservation, not grazing. Any impacts would be long-term, moderate, and beneficial.

6. Human Health and Safety

Existing Environment/No Action Alternative.

There are no known human health or safety concerns within the Winslow 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 are 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 of PPE including gloves, waders, eye protection, and a paper respirator. The EPA (2007) conducted an analysis of the human health risks for 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 dermal route of exposure. However, when diluted with water at concentrations proposed for the treatment of Winslow Creek, no adverse impacts to human health and safety would be expected.

Rotenone is not an eye or skin irritant nor 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 rotenolone and tephrosin, respectively. The EPA (2007) and Fang and Cassida (1997) concluded these other rotenoids are less toxic than rotenone.

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; Winslow Creek by comparison will be treated at 50 ppb. Also, during application, personnel would be onsite 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 KMnO4 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.

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 Winslow 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 (KMnO4) will be applied at the Deactivation Station to all water flowing out of the project area to degrade and eliminate rotenone. Following deactivation with KMnO4, 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) conducted an analysis of 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 Legumine formulation. Solvents such as xylene, trichloroethylene (TCE), and tetrachloroethylene are residue 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 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 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 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 period of 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 makes 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 have 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 actually 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 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 a 10 day period 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 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). They 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 $KMnO_4$) 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 Winslow 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.

7. Quantity and Distribution of Employment

Existing Environment/No Action Alternative

Employment directly tied to the Winslow Creek drainage is primarily attributed to private agricultural activities on the lower end of Winslow Creek, and commercial outfitting at Breneman Lake. BLM personnel manage the land resources in the drainage and FWP manages the fish and wildlife resources. Existing staff for both agencies cover these management responsibilities as part of their typical 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, BLM, USFS, USFWS) 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 and Arctic grayling populations in the affected section of Winslow Creek remain 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 Winslow Creek drainage. FWP has not previously treated the affected section of Winslow Creek with rotenone. However, if the initial rotenone treatment is unsuccessful in eradicating the hybrid trout population from the affected stretch of Winslow 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

Three private residences occur within the proposed Winslow Creek project area. No residences exist on BLM land.

Direct Impacts

No significant direct adverse impacts would be expected because of the proposed project. The proposed project would use existing agency personnel (FWP, BLM, USFS, USFWS) and/or 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 Winslow 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 population 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 Winslow Creek with rotenone. However, if the initial rotenone treatment is unsuccessful in eradicating the hybrid trout population from the affected stretch of Winslow 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.

The BLM manages the land and aquatic habitat in the upper portions of the Winslow Creek drainage, while the lower half of the drainage is privately owned. FWP manages the wildlife and fisheries resources of the drainage. The loss of additional native WCT and Arctic grayling populations across Montana, including in the Centennial Valley, could result in either species being federally listed as threatened or endangered under the ESA. Native WCT and Arctic grayling 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, USFS, USFWS, and BLM) 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 and Arctic grayling populations 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 Winslow 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 Winslow Creek with rotenone. However, if the initial rotenone treatment is unsuccessful in eradicating the hybrid trout population from the affected stretch of Winslow 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 Winslow Creek would remain intact. It is likely that more nonhybridized populations of WCT in the Red Rock 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 which cannot be protected in place. The aboriginal population of WCT in Winslow Creek was lost through hybridization with rainbow and Yellowstone cutthroat trout which were historically stocked in the drainage (legally and illegally). Since 2011, eleven populations of WCT in the Red Rock drainage have been lost or become hybridized. FWP is obligated to keep species from being listed under the ESA. FWP also manages WCT and Arctic grayling according to the Memorandum of Understanding and Conservation Agreement for Westslope Cutthroat Trout in Montana (2007), Memorandum of Understanding Concerning Arctic Grayling (2007), WCT Conservation Strategy for the Missouri Headwaters of Southwest Montana (2022), Upper Missouri River Arctic Grayling 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 conservation populations of native WCT and Arctic grayling in the affected section of Winslow 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 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 and Arctic grayling 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 Red Rock River drainage, WCT will occupy 226 miles of stream or nearly 70% 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 Winslow 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
1	The **severity, duration, geographic extent,** and **frequency** of the occurrence of the impact **"Severity"** describes the density of the potential impact, while **"extent"** 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. **"Duration"** describes the time period during which an impact may occur, while **"frequency"** 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).
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 54th 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	☐	☒
Does the action result in either a permanent or an indefinite physical occupation of private property?	2	☐	☒
Does the action deprive the owner of all economically viable uses of the property?	3	☐	☒
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	☐	☒
Is there a reasonable, specific connection between the government requirement and legitimate state interest?	4a	☐	☐
Is the government requirement roughly proportional to the impact of the proposed use of the property?	4b	☐	☐
Does the action deny a fundamental attribute of ownership?	5	☐	☒
Does the action have a severe impact of the value of the property?	6	☐	☒
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	☐	☒
Is the impact of government action direct, peculiar, and significant?	7a	☐	☐
Has the government action resulted in the property becoming practically inaccessible, waterlogged, or flooded?	7b	☐	☐
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	☐	☐
Does the proposed action result in taking or damaging implications?		☐	☒
Taking or damaging implications exist if **YES** 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 **NO** 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.
Alternatives: 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 Arctic grayling 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 (Beaverhead-Deerlodge National Forest) and other project partners. Several strategies were used to inform the public about and solicit comments on the proposed action. These strategies included:

- Press release
- 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 availability of the Draft EA for public review, summarizes the proposed project, identifies the time-period available 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: March 21, 2024

  Public Comment Period Ends: April 20

Comments must be addressed to the FWP contact listed below.

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

  Name: Ryan Kreiner
  Email: rkreiner@mt.gov
  Mailing Address:

Montana Fish, Wildlife & Parks
c/o Winslow Creek WCT Restoration EA comments
730 ½ Montana Street
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Recommendation for Further Environmental Analysis:

NO further analysis is needed for the proposed action	☒
FWP must conduct **EIS** level review for the proposed action	☐

XIII. EA Preparation and Review

	Name	**Title**
EA prepared by:	Ryan Kreiner	Region 3 Native Fisheries Biologist
EA reviewed by:	Matt Jaeger Eric Merchant Ben Rowe	Regional Native Fish Program Manager MEPA Coordinator Legal Counsel

Appendix A: References

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