DRAFT

ENVIRONMENTAL ASSESSMENT

Westslope Cutthroat Trout Restoration in McGinnis Creek North Fork Flathead River Drainage

(FWP-SEA-FSH-R1-26-011)

March 4, 2026

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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: Westslope Cutthroat Trout Restoration in McGinnis Creek

The cutthroat trout (Westslope cutthroat trout (WCT) and Yellowstone cutthroat trout (YCT)) are Montana's state fish. Westslope cutthroat trout (*Oncorhynchus clarkii lewisi)* were first described by the Lewis and Clark Expedition in 1805 near Great Falls 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 (Liknes 1984, McIntyre and Rieman 1995, Shepard et al. 1997, Shepard et al. 2005). Many of these remaining populations are at risk due to small population size, and most importantly, threats from competition, predation, and hybridization with nonnative 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; 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 (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), non-governmental conservation and industry organizations, Tribes, resource users, and private landowners (FWP 1999). 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*. The highest priority of conservation efforts is to secure existing, non-hybridized populations of WCT in place to conserve the remaining genetic diversity remaining on the landscape. Secure WCT populations are isolated from nonnative species (usually by a fish barrier) and occupy enough habitat to ensure long-term persistence.

The entire Flathead River system has seen introductions of nonnative fish that are threatening pure WCT populations. FWP proposes to conserve WCT in McGinnis Creek to expand their range by removing hybrids between native WCT and nonnative YCT trout above a waterfall barrier low in the drainage. McGinnis Creek meets Canyon Creek and flows 200 meters to the North Fork Flathead River. The entire drainage is on USFS land near the town of Columbia Falls, MT. Canyon and McGinnis Creeks have fish barriers within 400 meters of the North Fork Flathead River. While there may be incidental use by bull trout below these barriers, neither drainage supports a bull trout population. In October 2026, FWP electrofished below the barriers of Canyon and McGinnis Creeks and no bull trout were detected.

McGinnis Creek was stocked with generic cutthroat in the 1940s (Table 1). No other stocking records exist. A 2022 genetic report from the University of Montana Conservation Genetics Laboratory indicates McGinnis Creek harbors a population with very high YCT ancestry. The genetic results show WCT 27.2%, RBT 0.8%, and YCT 72.0%.

Table 1. Historic Stocking Records

Water	Date	Species	Number
McGinnis Creek	9/21/1949	2 - Cutthroat Trout	6400
McGinnis Creek	8/2/1943	2 - Cutthroat Trout	10000
McGinnis Creek	7/28/1940	2 - Cutthroat Trout	6400

Figure 1. WCT would be introduced to McGinnis Creek following removal of nonnative trout.

The nonnative 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 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 no risk to terrestrial and avian animals that consume rotenone treated waters or dead fish because of the low application rate used to kill fish, and rotenone is readily broken down by digestive processes. Rotenone does have temporary adverse impacts on aquatic invertebrates, particularly those that breath through gills. However, at the concentrations proposed, invertebrates recover within one year after treatment with rotenone. Schnee et al. (2021) found taxa reductions in density and diversity one year after treatment followed by full recovery within three years. Amphibians are susceptible to the effects of rotenone during their gill-breathing life stage. Effects on amphibian populations can be mitigated by timing the piscicide application for early fall, when the gill-breathing life stage has been completed, and using concentrations sub-lethal to amphibians (Fried et al. 2018) 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 has no effect on aquatic or terrestrial plants. Rotenone would be administered by trained FWP personnel following requirements and guidance on the label, American Fisheries Society 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 four hours. In addition, backwaters, spring areas, and small tributaries would be treated with backpack sprayers according to label specifications. The rotenone treatment of McGinnis Creek would start August 31, 2026, and take 2-3 days. An area closure will be in place for the McGinnis Creek drainage including USFS Roads FS5224 and FS5271. McGinnis Creek Road FS803 will remain open. Another treatment in 2027 may be necessary if eDNA results detect fish. Testing with eDNA uses genetic methods to detect the DNA of organisms shed into the environment, and is highly effective at detecting organisms that may be present at very low densities. This technique has proven effective at detecting even a single fish in an entire watershed (Carim et al. 2020).

To prevent rotenone from traveling downstream of the proposed treatment areas and affecting fish downstream of the fish barriers, potassium permanganate ($KMnO_4$) would be applied to the stream to neutralize rotenone. 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). Per the rotenone label requirements, public access to McGinnis Creek will be prohibited during the prescribed 2-3 day treatment period.

This project would expand the distribution of WCT by approximately 4.5 miles in McGinnis Creek. This conservation project is intended to secure a small amount of the overall fish-bearing habitat for WCT to ensure their long-term, self-sustaining persistence.

Affected Area / Location of Proposed Project

- Legal Description
    - Latitude/Longitude: McGinnis Creek: 48.531754°N, -114.159646°W
    - Section, Township, and Range: McGinnis Creek: T32N R20W Sec 8
    - Town/City, County, Montana: McGinnis Creek is 12 miles north of Columbia Falls, Flathead County Montana

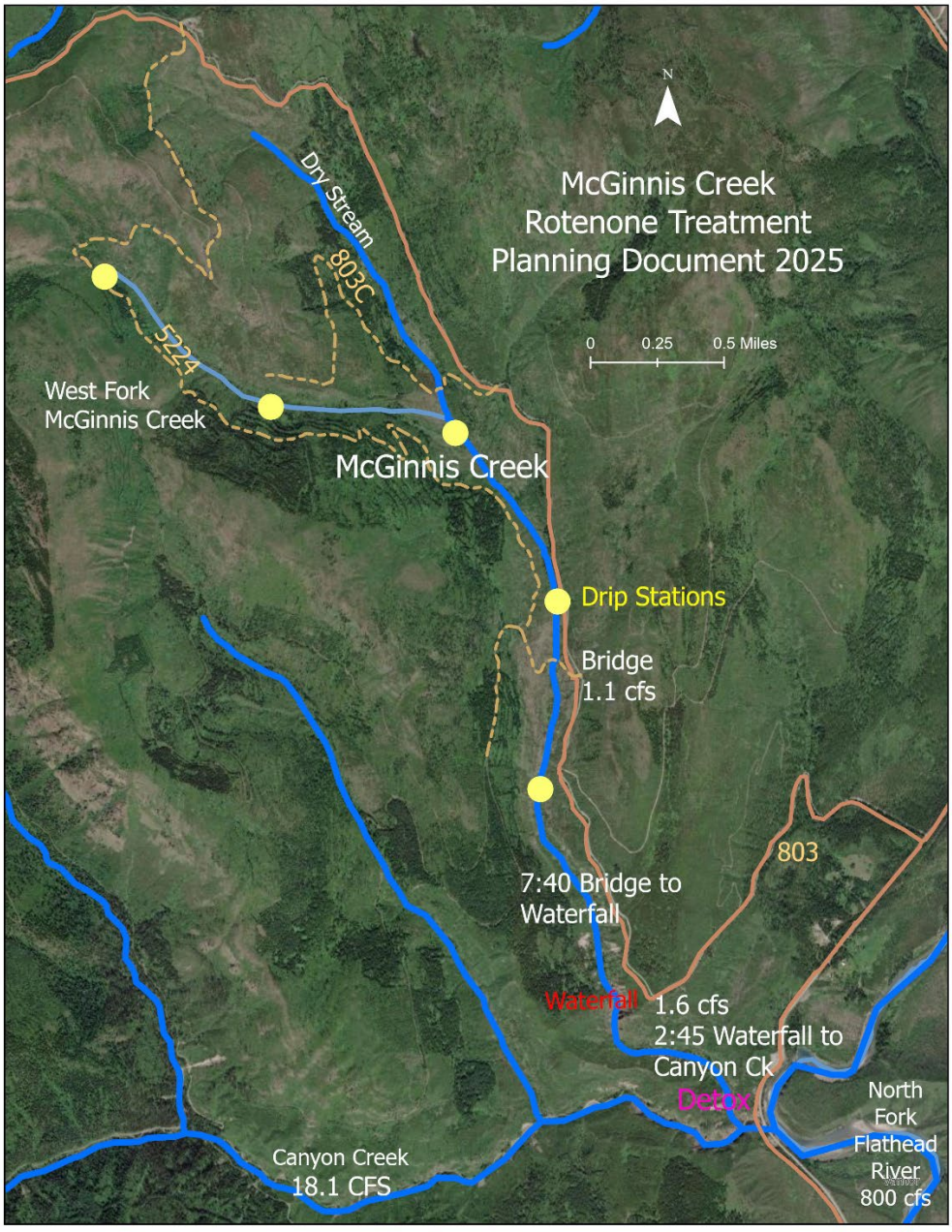

Figure 2. McGinnis Creek project area.

III. Purpose and Need

The purpose of the proposed project is to protect native WCT in McGinnis Creek by removing nonnative fish upstream of a natural waterfall barrier. WCT require conservation intervention to ensure their long-term persistence. 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.

Benefits of the proposed project include the following:

- Ensure continued survival of WCT
- Meet Montana's statutory obligation to prevent listing of WCT under the ESA.
- Satisfy the conservation objectives of the following guiding document:
    - Memorandum of Understanding and Conservation Agreement for Westslope Cutthroat Trout in Montana (2007)

	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
Montana Department of Environmental Quality (DEQ)	Pesticide (Piscicide) Discharge Permit	Discharge of Pesticide to state waters
Department of Agriculture	Pesticide (Piscicide) Applicator License	Authorizes applicators to apply rotenone

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 the 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 areas.	
Rotenone Label	MT Dept of Agriculture, US Environmental Protection Agency	The Montana Pesticides Act (MPA), Title 80, Chapter 8, Sections 80-8-101 through 80- 8-405, MCA, Federal Insecticide, Fungicide and Rodenticide Act	Regulates safety procedures, application rates and neutralization of rotenone application.	
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.”	
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) This project will be coordinated with the Flathead 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	License	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 would not be protected in McGinnis Creek.

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 McGinnis 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.

Alternative 2: Proposed Project

FWP proposes to protect and restore WCT in McGinnis Creek by removing nonnative trout upstream of a waterfall barrier using the piscicide rotenone. FWP would repopulate McGinnis Creek with WCT from Hay Creek. 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 nonnative trout from McGinnis Creek.

Alternative 3 would attempt to remove the current population of nonnative trout by electrofishing rather than applying rotenone. Multiple-pass electrofishing has been used to eradicate nonnative trout from several small streams in 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. Generally, electrofishing is 50-70% efficient at capturing fish depending on the type of habitat and fish size distribution. Furthermore, electrofishing removal is labor intensive, inefficient at capturing juvenile fish, and requires multiple years to allow juvenile fish to grow to the size where they can be readily captured. The reaches where electrofishing removals have been successful were generally less than three miles 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 three to nine people and would likely occur over at least five years. Mechanical removals using electrofishing 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 (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).

Removing nonnative trout from McGinnis Creek with electrofishing would likely be unsuccessful because of the length of stream occupied by fish (4.5 miles total) and the complexity of the habitat (e.g., woody debris, thick riparian vegetation, difficult access). Such an effort would be impractical and likely would not achieve the intended result, as it is uncertain if 100% removal of nonnative trout could be achieved with electrofishing given the length of the stream and the complexity of the habitat.

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

  Under 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.

- Alternative 2: Proposed Project

  See Cumulative Impacts Analysis: Table 3, Impacts on Physical Environment; and Table 4, Impacts on Human Population.

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 North Fork Flathead River drainage include small and large mammals, birds, reptiles, amphibians, and fish. The North Fork provides habitat for big game species (elk, mule deer, white-tailed deer, moose, mountain goat, 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), one ESA listed *threatened* fish (bull trout), one species of fish listed by the state of Montana as species of concern (westslope cutthroat trout) and one ESA-delisted bird (bald eagle). The North Fork also provides habitat for upland game bird species including ruffed grouse, Franklin's grouse and blue 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 McGinnis Creek drainage are typical of those found throughout North Fork Flathead River sub-basin. This drainage is dominated by western larch, lodgepole pine, Engelmann spruce, Douglas fir, cottonwoods, willows, and woody plants.

The aquatic habitat consists primarily of moderate gradient Rosgen "B" type stream channel dominated by boulder and small cobble substrates. Short reaches of stream exist in McGinnis Creek with low gradient channels and abundant fine gravels. The fishery in McGinnis Creek within the project area consists of Yellowstone cutthroat hybrids.

Direct Impacts

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

Terrestrial Habitats:

No ground disturbing activities would occur under the proposed action. However, some direct, but minor and temporary adverse impacts to terrestrial habitats would be expected. These impacts would be primarily related to project personnel walking along the banks of McGinnis Creek during project implementation. The treatment of McGinnis Creek would be performed by eight FWP personnel. Any impacts on vegetation are anticipated to be unnoticeable within one growing season. Direct impacts to terrestrial habitat would be short-term, negligible, and mitigated by personnel working primarily along the margins of the stream and use of existing roads and trails.

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 McGinnis Creek. However, the entire treatment is expected to last less than three days. Project personnel will only be present in each affected reach of McGinnis Creek for a single day so displaced terrestrial life would be expected to quickly return to the area. Any adverse direct impacts to terrestrial and avian life would be short-term, minor, and mitigated by personnel working primarily along the margins of the stream.

Mammals:

Mammals are not affected by rotenone at concentrations applied for fish removal because terrestrial wildlife exposure occurs only through consuming treated water or fish killed by rotenone. Ingested rotenone is rapidly broken down by enzymatic action in the stomach and intestines (American Fisheries Society 2002). Therefore, the low concentrations of rotenone used to kill fish pose no risk to terrestrial wildlife. 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 (California Department of Fish and Game 1994). 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 the consumption of rotenone by 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). Chickens, pheasants, and members of lower orders of Galliformes were resistant to rotenone, and four-day old chicks were more resistant than adults (Cutkomp 1943). Rotenone is slightly toxic to wildfowl, but to kill Japanese quail required 4,500 to 7,000 times more than is used to kill fish (Ware 2002).

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 to 1.08 µg/g in common carp (Jarvinen and Ankley 1999). 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 unlikely that piscivorous birds will consume enough fish to result in a lethal dose. Direct impacts to avian life would be short-term and negligible.

Fish:

The purpose of the project is to remove nonnative trout in McGinnis Creek upstream of a waterfall barrier to restore native WCT. Adverse project impacts would be minor and primarily include the temporary loss of a fishery until WCT become reestablished. Nonnative trout are present throughout the North Fork Flathead River drainage. The loss of nonnative fish in McGinnis Creek would be mitigated by other similar creeks nearby where FWP will continue to manage for nonnative fish. The impacts to WCT will be long-term and beneficial.

Aquatic Invertebrates:

Rotenone can have acute and sometimes substantial impacts on aquatic invertebrates, but impacts are short-term and invertebrate communities generally rebound to pre-project abundance and diversity within 1 year. One 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 concentrations for this proposed project (Houf and Campbell 1977). Delayed recovery of taxa richness (number of taxa present) has been observed following some rotenone treatments, but many of these treatments were at higher concentrations than proposed herein (Mangum and Madrigal 1999). High concentrations of rotenone (> 100 ppb) and treatments exceeding 8 hours, typically resulted in severe impacts to invertebrate richness and abundance (Finlayson et al. 2010). Conversely, lower rotenone concentrations (1ppm as is proposed for McGinnis Creek) and treatments less than 8 hours (6 hours proposed in McGinnis Creek), resulted in less impact to invertebrate assemblages. Clams and snails were between 50 and 150 times more tolerant than fish to Noxfish (5% rotenone formulation; Chandler and Marking (1982). 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, 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 (Engstrom-Heg et al. 1978).

Temporary changes in aquatic invertebrate communities due to a rotenone treatment would be similar to what is observed after natural (e.g., fire) and/or anthropogenic (livestock grazing) disturbances (Mihuc and Minshall 1995; Wohl and Carline 1996; 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 rotenone treatment. Because of their short life cycles (Matthaei et al. 1996), good dispersal ability (Pennak 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 outside the project areas (e.g., mayflies, caddis, stoneflies). Therefore, the possibility of eliminating a rare or endangered species of aquatic invertebrates by treating with rotenone in is unlikely. Furthermore, the Montana Natural Heritage Program lists no aquatic invertebrate species of concern or potential species of concern in McGinnis 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.

Amphibians and Reptiles:

Amphibians and reptiles potentially found within the proposed treatment area include: Columbia spotted frogs, western toads, Rocky Mountain tailed, long-toed salamander , western terrestrial garter, common garter, and rubber boa snakes. Rotenone has little to no effect on adult, air-breathing amphibians but it can be toxic to gill-breathing larval amphibians. Reptiles would not be directly affected by the rotenone treatment because they are highly resistant to rotenone at fish killing concentrations. Southern leopard frog tadpoles were between 3 and 10 times more tolerant than fish to Noxfish (5% rotenone formulation; Chandler and Marking 1982). Long-toed salamanders, Rocky Mountain tailed frogs, and Columbia spotted frogs would not suffer an acute response to rotenone at trout killing concentrations (0.5-1 ppm) but the larvae would likely be affected (Grisak et al. 2007). Therefore, rotenone treatments should occur 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.

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. On a recent rotenone treatment in Selway Creek (Beaverhead River drainage), Columbia spotted frogs were observed to be abundant in Selway Lake in the spring following a rotenone treatment the previous summer. Direct impacts to amphibians would be short-term and minor.

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 McGinnis Creek. Because piscivorous avian species are mobile they would have access to other nearby waters where fish are more abundant. Therefore, 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 McGinnis Creek drainage are fish obligates. Furthermore, 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 temporarily 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 areas downstream of the fish barriers or nearby streams where invertebrates would not be affected. However, the aquatic

invertebrate community is expected to rapidly recover and most amphibians and reptiles are not aquatic invertebrate obligates. Therefore, 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 conservation.

The conservation goals for WCT in Montana focus on maintaining viable, genetically pure populations and restoring their historical distribution. Where feasible, nonnative trout removal may be implemented to protect existing populations which may require expanding into additional habitats and/or translocating fish to maintain genetic diversity. These efforts aim to ensure long-term persistence, genetic integrity, and ecological resilience.

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

2. Water Quality, Quantity, and Distribution

Existing Environment/No Action Alternative

McGinnis Creek is a relatively pristine basin with no known water quality impairments.

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 remove nonnative trout from the proposed project area of McGinnis 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 and therefore does not persist in the environment. Natural break down is influenced by water chemistry, water temperature, exposure to organic substances, exposure to air, and sunlight intensity (Loeb and Engsrtom-Heg 1970; Engstrom-Heg 1972; Gilderhus et al. 1986; Ware 2002; ODFW 2002;). 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 (Gilderhus et al. 1986; Dawson et al. 1991). Natural detoxification of rotenone also occurs through dilution, which occurs when untreated ground or surface water flows into a lake or stream. The combination of natural breakdown and dilution in streams usually results in complete detoxification of rotenone within 24-48 hours.

In addition to natural methods of breakdown, rotenone can be rapidly neutralized through application of an oxidizing agent such as potassium permanganate ($KMnO_4$). The dry crystalline substance is mixed with stream or lake water to produce a concentration of liquid sufficient to detoxify the rotenone. Neutralization is accomplished after about 15-30 minutes of exposure time of treated waters. As treated water leaves the project areas at the fish barriers, $KMn0_4$ is applied to the stream at a rate such that the residual value measured 30-minutes of travel time downstream remains at 0.5-1.0 ppm. The reach of stream between the $KMnO_4$ application point and 30 min of travel time downstream is known as the

neutralization zone. Concentrations of $KMnO_4$ can be directly measured in the stream with a hand-held meter to maintain concentrations between 0.5 and 1.0 ppm. $KMnO_4$ can be toxic to fish at higher concentration but few impacts to fish occur at concentrations used to detoxify rotenone. $KMnO_4$ is a respiratory and eye irritant and creates persistent stains on both skin and clothes. $KMnO_4$ is commonly used for other applications such as treatment of skin conditions (e.g., eczema, athlete's foot), disinfection, and treating wastewater.

Detoxification of rotenone would be used in McGinnis Creek at the fish barrier 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 (FWP 2021), which states that neutralization with KMnO4 will begin no less than 2 hours before the theoretical arrival time of treated waters at the neutralization station. Therefore, $KMnO_4$ application would begin no less than two hours before any rotenone treated waters would be present at the fish barriers. $KMnO_4$ would be continuously applied to the streams until all treated waters have passed over the fish barriers and sentinel fish placed in the stream survive for four hours with no signs of stress.

The detoxification efficacy would be measured in two ways: first, sentinel fish would be placed in live-car cages immediately upstream and downstream of the neutralization zone. Signs of rotenone toxicity in fish (loss of equilibrium and/or death) at the fish barriers indicate the presence of treated waters at the fish barriers. A lack of rotenone toxicity at the 30-min mark indicates that rotenone has been fully neutralized. Second, residual $KMnO_4$ levels would be measured at the 30-minute downstream location with a handheld meter. The hand-held meter allows direct measurement of $KMnO_4$ concentrations in the stream. Residual levels of 0.5-1.0 ppm $KMnO_4$ at 30 min travel downstream fully neutralizes rotenone. These two methods of monitoring ensure full neutralization of rotenone downstream of the project areas. It is anticipated that neutralization will occur continuously for 24 to 48 hours after the application of rotenone is complete. Adverse direct impacts of rotenone application would be short-term, mitigated by the use of $KMnO_4$, and minor.

Secondary Impacts

No significant adverse secondary impacts would be expected because of the proposed project. Dead fish would result from the proposed project. As dead fish decay they may cause secondary impacts to water quality. Nine of 11 lakes in Washington treated with rotenone experienced an algae bloom shortly after treatment (Bradbury 1986). This is attributed to the input of phosphorus to the water from decaying fish. Approximately 70% of the phosphorus content of the fish stock would be released into the water through bacterial decay (Bradbury 1986). This action may be beneficial because it would stimulate algae and invertebrate production. 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 McGinnis Creek.

3. Geology

Existing Environment/No Action Alternative

The southern Whitefish Range in northwest Montana is characterized by a complex geological history dominated by Precambrian and Paleozoic formations. The oldest rocks belong to the Belt Supergroup, specifically the Ravalli Group and Helena Formation, which consist of metasedimentary argillites, quartzites, and magnesian limestones metamorphosed to greenschist facies. These Proterozoic rocks form the structural core of the range. Overlying them are Cambrian carbonates, including the Elko Formation, which features dolomitic mudstones, oncoidal and stromatolitic limestones, and fenestral textures indicative of shallow marine environments. Devonian strata such as the Fairholme Group, Alexo, and Pallisier Formations introduce stromatolitic and bioclastic dolomites rich in fossils and conodonts, while Mississippian units like the Banff and Exshaw Formations occur locally as fault-bounded carbonate blocks.

Structurally, the region is dominated by the Lewis Thrust, a major west-dipping fault that emplaced older Belt rocks over younger Paleozoic carbonates during Laramide compressional events. Folding trends generally run north to northwest, and post-thrust deformation introduced numerous splinter faults. To the west, the Rocky Mountain Trench and associated normal faults, such as the Mission Fault, created deep structural basins with significant vertical displacement. Surficial geology reflects Pleistocene glaciation, which carved valleys and deposited extensive glacial till, while Tertiary lacustrine sediments occur in localized basins near the North Fork Flathead River.

Overall, the southern Whitefish Range records a long geological evolution—from Precambrian sedimentation and metamorphism, through Paleozoic carbonate deposition, to thrust faulting and basin development—culminating in Quaternary glacial sculpting that shaped its present rugged landscape.

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 nonnative trout to protect native WCT would not result in 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 past or present related state projects that would impact geology in the McGinnis Creek drainages. FWP has not previously treated the affected section of McGinnis Creek with rotenone. However, if initial rotenone treatments are unsuccessful in eradicating the nonnative trout from the project reach, additional treatments 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

The soils in the North Fork Flathead River drainage are primarily deep, well-drained alluvial soils formed from glacial outwash and stream deposits. These soils typically consist of gravelly sandy loam to loam textures, reflecting the influence of coarse glacial till and fluvial sorting. The surface horizons often include a thin layer of volcanic ash from the Mount Mazama eruption, which improves water-holding capacity and nutrient retention. Subsoils are commonly stratified with sand and gravel lenses, providing excellent drainage and aeration. These soils are generally neutral to slightly alkaline, supporting riparian vegetation such as cottonwood, willow, and mixed conifer stands. Their structure and permeability make them critical for maintaining streambank stability and filtering runoff, which helps preserve the high water quality essential for aquatic species in the North Fork system.

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 nonnative trout to conserve native WCT in McGinnis 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 McGinnis Creek drainage. FWP has not previously treated McGinnis Creek with rotenone. However, if the initial rotenone treatment is unsuccessful in eradicating the hybrid trout population from McGinnis Creek, additional treatment may be deemed necessary. If additional treatment with rotenone is deemed necessary, no impacts to soils in the affected area would be expected.

5. Vegetation Cover, Quantity, and Quality

Existing Environment/No Action Alternative

The McGinnis Creek riparian area is forested with a mix of Douglas fir, western larch, Engelmann spruce, lodgepole pine, mountain ash, green alder, huckleberry, red-osier dogwood and willow species. Nine rare and sensitive plant species are potentially present in the McGinnis Creek drainage including Hudson Bay bullrush, English sundew, slender cotton-grass, mud sedge, Drummond willow, water howellia, MacFarlane's four o'clock, western prairie fringed orchid and Spalding's catchfly. 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 to vegetation cover, quantity and quality because of the proposed project. Short-term and negligible impacts to vegetation cover, quantity, and quality may occur. Riparian (streamside) vegetation may be adversely and directly impacted by the trampling of plants from project personnel walking up and down the banks of McGinnis Creek. The rotenone treatment of McGinnis Creek would be performed by up to eight FWP personnel. Furthermore, only a limited number of personnel (1-2) would operate in each affected stream reach at any given time, thereby mitigating any potential impacts from trampling of plants.

Since there are no ground disturbing activities associated with the proposed project, potential impacts are expected to be short-term and minor. Potential personnel trampling can be mitigated by the limited number (only 1-2 individuals per reach of stream) and time spent (1 day) in each reach of stream. Any potential impacts to these species would be similar to an angler fishing the stream. 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 project areas using existing trail and road systems to the extent practicable.

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. 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. 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 McGinnis Creek with rotenone. However, if the initial rotenone treatment is unsuccessful in eradicating the nonnative trout, 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 other past, present, or future related state projects that would impact vegetation cover, quantity, and quality in the affected area. Furthermore, 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

McGinnis Creek is a small, fast flowing stream surrounded by steep, rugged mountains. The entire drainage was burned in the 2003 Robert Fire and stand regeneration is taking place.

Direct Impacts

No significant adverse direct impacts would be expected because of the proposed project. Dead fish may accumulate in certain areas, which some people 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. Adverse direct impacts to aesthetics would be short-term, minor.

Secondary Impacts

No significant adverse secondary impacts would be expected because of the proposed project. The elimination of nonnative trout to conserve native WCT in McGinnis 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 McGinnis 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 roads (fugitive dust source) and vehicle exhaust emissions.

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 areas will cause exhaust fumes and road dust. Such impacts would be short-term and negligible. Additionally, roads are absent throughout much of the McGinnis Creek 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.

Secondary Impacts

No significant adverse secondary impacts would be expected because of the proposed project. The elimination of nonnative trout to conserve native WCT in McGinnis 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 McGinnis Creek with rotenone. However, if the initial rotenone treatment is unsuccessful in eradicating the nonnative 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 North American wolverine, grizzly bear, and Canada lynx as *threatened species* that may be present in the McGinnis Creek drainage. Other state-listed *species of concern* that may be present in the drainage are the gray wolf, little brown bat, and western toad. There are no plant species of concern in the McGinnis Creek project area.

Direct Impacts

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

Mammal Species:

The proposed project is within the range of grizzly bear, gray wolf, Canada lynx, wolverine, and little brown bat. Because mammals are not sensitive to rotenone at concentrations used to kill fish, no adverse impacts from rotenone treatment would be expected on these species that consume dead fish or drink treated waters within the project area. Adverse impacts to these species that may use or travel through the affected area would potentially include only temporary displacement when personnel are present. Multiple drainages with similar habitats and resources are adjacent to the proposed project areas; therefore, it would be expected such areas would be readily used as alternative habitats should any of these species be temporarily displaced during project implementation. Therefore, any direct adverse impacts to these species would be short-term and minor. All of these species are present in the North Fork Flathead River drainage and all species have much wider home ranges than the proposed project area and may not be present during project implementation.

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. Furthermore, 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.

Avian Species:

The black swift, Harlequin duck, flammulated owl, northern hawk owl, American goshawk, bald eagle, golden eagle, Clark's nutcracker, black backed woodpecker, Lewis' woodpecker, and pileated woodpecker are *species of concern* in Montana. For most of the sensitive bird species listed above direct impacts include only temporary displacement due to increased human activity in the drainage. None of the sensitive birds that may be within the project area are piscivorous. Rotenone has no effect on bird species that consume treated waters or consume dead fish when applied at fish killing concentrations.

Vegetation:

Rotenone has no impact on terrestrial or aquatic plant species. Therefore, the only potential impact to plant species would be trampling due to increased foot traffic in the riparian area. The presence of project personnel and associated trampling of riparian vegetation would not be expected to adversely impact any of the vegetation in the habitats they occupy. Potential impacts would be short-term (less than 1 growing season) and minor.

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 McGinnis Creek by removing nonnative trout and repopulating the stream with a genetically pure population of WCT. The resulting WCT population would be secured in 4.5 miles of habitat. Therefore, it is anticipated that any direct impacts to WCT in McGinnis Creek would be long-term, moderate, and beneficial.

Western toads constitute a *species of concern* and may be present in McGinnis Creek. 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. Such areas are typically not found in fast flowing, mountain streams like McGinnis Creek. These habitats generally are located off stream in shallow ponds and swamps, which, if not connected to the stream, would not be treated with rotenone. Adult toads occupy terrestrial habitats that would not be treated with rotenone and adult amphibians are less susceptible to rotenone. Impacts on juvenile amphibians would be mitigated by treating early in the fall when most juveniles have metamorphosed

into adults. Therefore, it is expected adverse impacts to western toads due to the proposed project would be short-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.

No machinery 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 treatment area. During application of rotenone the treatment area would be accessed by foot.

Secondary Impacts

No significant adverse secondary impacts would be expected because of the proposed project. The restoration of WCT in McGinnis Creek would benefit this species and, for the purposes of other affected species, would be consistent with existing conditions. 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."

The proposed project would benefit historic and ongoing WCT conservation efforts in the North Fork Flathead River drainage and help FWP meet its obligation to prevent this species from becoming listed as *threatened* or *endangered* under the ESA. Furthermore, no cumulative impacts to species currently listed as threatened under the ESA (grizzly bear, Canada lynx, wolverine, and bull trout) would be expected because of the proposed project.

WCT historically occupied all accessible coldwater streams and lakes in the Clark Fork, Kootenai, Missouri (above and including the Judith), and St. Mary drainages, with resident, fluvial, and adfluvial life forms. Today, nonhybridized populations persist in only about 20% of their historical range due to threats such as competition with nonnative trout, hybridization with rainbow trout, habitat degradation, and migratory barriers. Listed as a Montana Species of Concern, federal ESA listing was deemed unnecessary because of their broad distribution and presence in high-quality habitats. Conservation efforts include habitat restoration, fish passage improvements, removal of nonnative trout upstream of barriers, and identification of "conservation populations" for self-sustaining persistence, while stocking is limited to lakes and reservoirs for recreation or restoration, not streams. Angler regulations often emphasize catch-and-release or restricted harvest to protect remaining populations. This conservation measure would increase the geographic distribution of native WCT and preserve the genetic integrity of pure WCT.

FWP has not previously treated the affected section of McGinnis Creek with rotenone. However, if the initial rotenone treatment is unsuccessful in eradicating the nonnative trout population, additional

treatment may be deemed necessary. If additional treatment with rotenone occurs, 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

There is no evidence of historical use by Native Americans or early European settlers in the proposed project area.

Direct Impacts

No significant adverse direct impacts would be expected because of the proposed project. No ground disturbance would occur because of the proposed action. In keeping with the Montana Antiquities Act and related regulations (12.8.501-12.8.510), 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 areas, 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 areas 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 areas 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 nonnative trout to conserve native WCT in McGinnis Creek would 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 sections of McGinnis Creek with rotenone. FWP is unaware of any other past, present, or future related state projects that would impact cultural resources that may be located in the affected area. No cumulative impacts to cultural resources would be expected because of the nonnative fish removal project or the resulting future WCT 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.

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 such as pickups and ATVs. However, 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, 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; impacts to the environmental resources of land, water, and air may occur because of the proposed project. However, 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.

The proposed action would not result in significant adverse direct climate change impacts. Impacts of the proposed action would be consistent with current impacts (i.e., the no action alternative).

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 to establish a conservation population in McGinnis Creek will not result in any changes to the natural flow regime. Therefore, no secondary impacts would be expected because of the proposed project.

The proposed action would not result in significant adverse secondary climate change impacts. Impacts of the proposed action would be consistent with current impacts (i.e., the no action alternative).

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. Furthermore, FWP is unaware of 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.

The proposed actions would not result in significant adverse climate change impacts. Impacts of the proposed actions would be consistent with current impacts (i.e., the no action alternative).

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

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 ingrained in the customs and lifestyles of residents and visitors to Montana alike.

Direct Impacts

No significant adverse direct impacts would be expected because of the proposed project on social structures and mores. 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. Adverse direct impacts associated with the elimination of hybrid trout from the affected sections of stream (i.e., loss of nonnative trout fishing opportunity in McGinnis Creek) would be mitigated by other nearby opportunities to fish for these nonnative fish species during and following the proposed project. Nearby fisheries for nonnative fish exist in the North Fork Flathead River, Canyon Creek and Cedar Creek, which are adjacent to McGinnis Creek.

The intent of the proposed project is to conserve and restore native WCT and eliminate hybridization and competition from nonnative trout. Therefore, the proposed project would create a unique native fishery that would directly benefit any person who enjoys fishing for native WCT or otherwise values this species existence, the state of Montana, and the ecosystem in which they reside. 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 nonnative trout to conserve native WCT will not result in any ongoing, long-term impacts to current land use or human activities. However, many Montanans, and those visiting the state for outdoor recreational purposes, hold high regard for the conservation of native species on the landscape, including WCT. Therefore, because the proposed project would create a unique native fishery and improve distribution, the proposed project would preserve important pre-project social structures, customs, values, and conventions associated with WCT. Furthermore, the loss of WCT conservation populations would result in a reduction in the remaining range of this 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.

Secondary impacts associated with the elimination of the nonnative trout fishery from the affected sections of McGinnis Creek would be mitigated by other opportunities to fish for nonnative trout, as numerous surrounding streams will continue to provide recreational fisheries. Therefore, 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 McGinnis Creek with rotenone. However, if the initial rotenone treatment is unsuccessful in eradicating the nonnative trout populations, additional treatments may be necessary. If an additional treatment with rotenone is necessary, no cumulative impacts would be expected.

Montana's existing WCT conservation plans intend to restore WCT to 20% of their historical range. The loss of WCT conservation populations would result in a reduction in the remaining range and could lead

to their listing as threatened or endangered under the ESA, changing state management of the species, and likely limiting public opportunity to fish for and otherwise interact with and enjoy these native fish species. FWP is unaware of any other past, present, or future related state projects that would cumulatively impact the existing social structures and mores of the affected human population, related to the affected native salmonid populations. Therefore, cumulative impacts would be long-term, moderate and beneficial.

2. Cultural Uniqueness and Diversity

Existing Environment/No Action Alternative

The proposed project would be located mostly in a remote, rural or uninhabited natural landscape on public land managed by the USFS. There are no permanent dwellings in the area.

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 nonnative trout to conserve native WCT within the proposed project area of McGinnis Creek will not result in any impacts to current land use or human activities 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 reaches of McGinnis Creek with rotenone. However, if the initial rotenone treatment is unsuccessful in eradicating nonnative trout, 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 cultural uniqueness and diversity of the area.

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 McGinnis Creek drainage. McGinnis Creek within the proposed project area is located on public lands managed by the USFS and are accessible to seasonal recreation opportunities including

hiking, horseback riding, fishing, hunting, trapping, and wildlife viewing. Vehicle and ATV access are present in the McGinnis Creek drainage.

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 McGinnis Creek during project implementation. Impacts on access to recreational resources can be mitigated by the numerous nearby opportunities to fish for nonnative trout and would offset any short-term adverse impacts realized by the proposed project. McGinnis Creek is relatively small and angling pressure is limited. Multiple nearby streams of similar size, and with similar fisheries exist within 10 miles of McGinnis Creek. These streams provide ample opportunities to angle for nonnative trout and would be available for public access during implementation of the proposed project. Furthermore, within only a few years after completion, WCT would be available for anglers to catch in this creek. Therefore, any adverse direct impacts would be short-term, negligible, and mitigated by other nearby and similar angling opportunities.

There would be short term impacts to public access into the McGinnis Creek drainage during the treatment. To reduce potential exposure, the rotenone label requires that public access to the treatment area be closed during the application of the piscicide. These impacts would be short-term and minor as the treatments are expected to last less than two days. Impacts to access can also be mitigated by performing the treatments Monday to Friday and avoiding weekends or holidays when recreation increases. The McGinnis Creek Road cuts through the hillside high above the waterline and is accessible to both ATVs and high clearance vehicles and will remain open during the treatment. Two gated roads provide access directly to McGinnis Creek and those roads will be closed to the public during the treatment.

Secondary Impacts

No significant adverse secondary impacts would be expected because of the proposed project. People who recreate in McGinnis Creek may view the loss of the existing nonnative trout fishery as an adverse impact, but angling pressure on the affected reaches of McGinnis Creek is minimal. Once native WCT are re-established in the treatment areas of McGinnis Creek, it would be expected these native species would provide the same or improved angling opportunities as the existing nonnative trout fishery provides today.

WCT historically occupied all accessible coldwater streams and lakes in the Clark Fork, Kootenai, Missouri (above and including the Judith), and St. Mary drainages, with resident, fluvial, and adfluvial life forms. Today, nonhybridized populations persist in only about 20% of their historical range due to threats such as competition with nonnative trout, hybridization with rainbow trout, habitat degradation, and migratory barriers. Listed as a Montana Species of Concern, federal ESA listing was deemed unnecessary because of their broad distribution and presence in high-quality habitats. Conservation efforts include habitat restoration, fish passage improvements, removal of nonnative trout upstream of barriers, and identification of “conservation populations” for self-sustaining persistence, while stocking is limited to lakes and reservoirs for recreation or restoration, not streams. Angler regulations often emphasize catch-and-release or restricted harvest to protect remaining populations. This conservation measure would increase the geographic distribution of native WCT and preserve the genetic integrity of pure WCT.

Projects that restore WCT, such as the one proposed for McGinnis Creek, are necessary to ensure the continued survival of this native species, conserve remaining genetic diversity, meet statutory obligations

to prevent listing under the ESA, and preserve angling opportunities for this native species. The proposed project would restore and protect (as a conservation population) native WCT in the affected area. Therefore, 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 McGinnis Creek with rotenone. However, if the initial rotenone treatment is unsuccessful in eradicating the nonnative trout populations, 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

McGinnis Creek is located entirely on public land administered by the USFS which constitute federally administered public lands that are not subject to any local or state taxes. No public inholdings exist within the McGinnis Creek drainage.

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 2-3 days, the use of fuel and purchase of products to implement the project would be limited. Therefore, 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 nonnative trout, or, conversely, beneficially impact those that prefer to fish for native WCT. Therefore, the proposed project may adversely or beneficially impact the associated local purchase of fishing licenses and goods and services to accommodate fishing opportunities. However, because relative fishing pressure is low in McGinnis Creek and many other nearby opportunities exist to fish for, or otherwise enjoy, recreational opportunities associated with either nonnative hybrid trout or the restored native WCT, 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 sections of McGinnis 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

No industrial, commercial or agricultural activities and/or production are currently taking place in McGinnis Creek.

Direct Impacts

No significant adverse direct impacts would be expected because of the proposed project. The removal of nonnative trout to conserve native WCT in McGinnis Creek will not result in any direct impact to commercial, industrial, or agricultural activities and/or production. While rotenone is actively in the stream, the public will be temporarily excluded from accessing McGinnis Creek. 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, commercial or agricultural activities occur in the affected area; therefore, no industrial activities or production would be impacted by the proposed project.

Cumulative Impacts

No significant adverse cumulative impacts would be expected because of the proposed project. FWP has not previously treated McGinnis Creek. 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 industrial, commercial, and agricultural activities and production.

6. Human Health and Safety

Existing Environment/No Action Alternative

There are no known current human health or safety concerns in the McGinnis 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 water and/or fish exposed to rotenone should have no adverse impacts to human health and safety.

Rotenone is a naturally occurring substance derived from tropical plants in the bean family such as the jewel vine and lacepod 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) concluded these other rotenoids are less toxic than rotenone.

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 treated waters and 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 (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 McGinnis Creek, no adverse impacts to human health and safety would be expected. 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 neutralization measures by applicators such as potassium permanganate, third, properly following piscicide labels, the additional 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.

Risk to humans from recreational exposure (i.e., swimming, wading) 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; McGinnis Creek would be treated at 50 ppb. Also, during application, the gated roads accessing McGinnis Creek would be closed and personnel would be onsite to inform the public and escort them from the treatment area should they enter. Placards would be place at the gated roads that access McGinnis Creek during the treatment. Rotenone treated waters would be contained to the proposed treatment area by adding potassium permanganate ($KMnO_4$) to the stream at the fish barrier, which would neutralize 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. It is expected that rotenone applied to McGinnis Creek would be present in the stream for a maximum of 24-48 hours after application, after which time natural processes will have fully neutralized any remaining chemical. 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 McGinnis Creek would be treated at 50 ppb, placards will prohibit entry to the waters within the project areas during treatments to prevent exposure. $KMnO_4$ will be applied at the fish barrier to the stream to neutralize rotenone. Following deactivation with $KMnO_4$, rotenone would be undetectable (< 1 ppb) and well

below the threshold level of concern (40 ppb) making incidental consumption of water downstream of the neutralization zone by humans entirely safe. 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. 2000, Skaar 2024 personal communication).

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 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 treated water, 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. Furthermore, 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 (Hazelton Raltech Laboratories 1982), gene mutations (Van Geothem et al. 1981; Biotech Research Laboratories 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 (e.g., 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. No information was 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. Following the label restrictions on rotenone use (i.e., restricting access to the treatment area, placarding and deactivation with $KMnO_4$) would eliminate or reduce to the extent practicable public exposure to rotenone. Therefore, any adverse direct risks 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 sections of McGinnis 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 other past, present, or future related state projects that would impact human health.

7. Quantity and Distribution of Employment

Existing Environment/No Action Alternative

Employment directly tied to the McGinnis Creek project is primarily attributed to employees from the State of Montana Fish, Wildlife & Parks. US Forest Service personnel manage the land resources in the drainage and FWP manages the fish and wildlife resources. Existing staff for both agencies would 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 from FWP and USFS. No impacts to the quantity and distribution of employment in the affected area would be expected because of the proposed project.

Secondary Impacts

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

Cumulative Impacts

No significant adverse cumulative impacts would be expected because of the proposed project. FWP is unaware of past or present related state projects that would impact employment in McGinnis Creek. FWP has not previously treated McGinnis Creek with rotenone. However, if the initial rotenone treatment is unsuccessful in eradicating the nonnative trout population from the project areas of McGinnis Creek, additional treatment may be deemed necessary. If additional treatment with rotenone is deemed necessary, no additional cumulative impacts would be expected.

8. Density and Distribution of Human Population and Housing

Existing Environment/No Action Alternative

No permanent residences exist within the proposed project area in McGinnis Creek.

Direct Impacts

No significant direct adverse impacts would be expected because of the proposed project. Applicators could temporarily camp in the area for the duration of the treatment (2-3 days). 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 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 McGinnis Creek with rotenone. However, if the initial rotenone treatment is unsuccessful in eradicating nonnative trout from McGinnis Creek, additional treatment may be deemed necessary. If additional treatments with rotenone are deemed necessary, no cumulative impacts would be expected because of the proposed project.

9. Demands for Government Services

Existing Environment/No Action Alternative.

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

Direct Impacts

No significant adverse direct impacts would be expected because of the proposed project. Primarily government personnel (FWP, USFS) would be used to implement and complete the proposed project. The proposed project would require 2-3 days of work for up to eight government employees. Therefore, 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 McGinnis Creek remain intact and viable. Modified activities would include periodic monitoring of the restored WCT population, including genetic testing. 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 McGinnis Creek with rotenone. However, if the initial rotenone treatment is unsuccessful in eradicating the nonnative trout populations from McGinnis 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 McGinnis Creek would remain intact. FWP is obligated to keep species from being listed under the ESA. FWP also manages WCT according to the MOU and Conservation Agreement for Westslope Cutthroat Trout in Montana (2007) 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 (FWP 2007, FWP 2023). Therefore, 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 conserve populations of native WCT in McGinnis Creek. Furthermore, the proposed action would adhere to existing state policy, guidelines and strategies (FWP 2007, FWP 2023), thereby furthering FWP's objectives related to long-term management of WCT. Secondary impacts would be long-term, moderate to major, and beneficial.

Cumulative Impacts

No significant adverse cumulative impacts would be expected because of the proposed project. The proposed project would benefit native WCT conservation efforts, which would help FWP meet its obligation to prevent this 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 Montana focuses on maintaining viable, genetically pure populations and restoring their historical distribution. West of the Continental Divide, the goal is to preserve diverse life histories and connectivity among populations through habitat protection, angling regulations, and selective use of barriers to prevent hybridization. Where feasible, nonnative trout removal may be implemented to protect existing populations. These efforts aim to ensure long-term persistence, genetic integrity, and ecological resilience while balancing recreational and economic values.

Once the proposed project is complete, WCT will occupy an additional 4.5 miles of stream which will help achieve restoration goals. A WCT conservation project like the proposed project, is intended to secure a small amount of the overall fish-bearing habitat for WCT to ensure the species long-term, self-sustaining persistence.

FWP has not previously treated McGinnis Creek with rotenone. However, if the initial rotenone treatment is unsuccessful in eradicating the nonnative 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**
Do 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 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 project partners (USFS). Several strategies were used to inform the public about and solicit comments on the proposed action. These strategies included:

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

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

- Montana Natural Heritage Program
- US Department of the Interior
    - Fish and Wildlife Service
- 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 4, 2026

  Public Comment Period Ends: April 2, 2026

Comments must be addressed to the FWP contact listed below.

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

  Name: Sam Bourret
  Email: sbourret@mt.gov
  Mailing Address:
  Montana Fish, Wildlife & Parks
  c/o McGinnis Creek WCT Restoration EA comments
  490 N. Meridian Road
  Kalispell, MT 59901

  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:	Sam Bourret	Fisheries Biologist
EA reviewed by:	Matt Boyer Mike Hensler Deb O'Neill	Region 1 Science Program Manager Region 1 Fisheries Program Manager MEPA Coordinator

Appendix A: References

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