Montana Fish, Wildlife & Parks

1400 South 19th Avenue
Bozeman, MT 59718

June 21, 2013

To: Governor's Office, Tim Baker, State Capitol, Room 204, P.O. Box 200801, Helena, MT 59620
Environmental Quality Council, State Capitol, Room 106, P.O. Box 201704, Helena, MT 59620
Dept. of Environmental Quality, Metcalf Building, P.O. Box 200901, Helena, MT 59620-0901
Dept. of Natural Resources & Conservation, P.O. Box 201601, Helena, MT 59620-1601
Montana Fish, Wildlife & Parks:

Director's Office	Parks Division	Lands Section	FWP Commissioners
Fisheries Division	Legal Unit	Wildlife Division	Design & Construction

MT Historical Society, State Historic Preservation Office, P.O. Box 201202, Helena, MT 59620
MT State Parks Association, P.O. Box 699, Billings, MT 59103
MT State Library, 1515 E. Sixth Ave., P.O. Box 201800, Helena, MT 59620
James Jensen, Montana Environmental Information Center, P.O. Box 1184, Helena, MT 59624
Janet Ellis, Montana Audubon Council, P.O. Box 595, Helena, MT 59624
George Ochenski, P.O. Box 689, Helena, MT 59624
Jerry DiMarco, P.O. Box 1571, Bozeman, MT 59771
Montana Wildlife Federation, P.O. Box 1175, Helena, MT 59624
Wayne Hurst, P.O. Box 728, Libby, MT 59923
Jack Jones, 3014 Irene St., Butte, MT 59701
Jack Atcheson, 2309 Hancock Avenue, Butte MT 59701
Beaverhead Conservation District, 420 Barrett Street, Dillon, MT 59725
U.S. Army Corp of Engineers, 1520 E 6th Avenue, Helena, MT 59601
U.S. Fish and Wildlife Service, 585 Shepard Way, Suite 1, Helena, MT 59601
U.S. Fish and Wildlife Service, 420 Barrett Street, Dillon, MT 59725
Big Hole Watershed Committee, Box 21, Divide, MT 59727
Montana Trout Unlimited, P.O. Box 7186, Missoula, MT 59807
Dan Vermillion, FWP Commissioner, 13 Kindsfather Dr., Livingston MT 59047
Earnest and Colleen Bacon, 2215 Fishtrap Creek Road, Wisdom, MT 59761
Dept. of Natural Resources and Conservation, 730 N. Montana Street, Dillon, MT 59725-9424
George Grant Chapter of Trout Unlimited, P.O. Box 563, Butte, MT 59703
Skyline Sportsmen, P.O. Box 173, Butte, MT 59703
Anaconda Sportsmen, 2 Cherry, Anaconda, MT 59711

Ladies and Gentlemen:

The enclosed draft Environmental Assessment has been prepared for the Reintroduction of Native Westslope Cutthroat Trout in Greenhorn Creek by removal of Nonnative Hybrid Rainbow x Cutthroat and Brook Trout with rotenone. The project proposal is to remove hybridized cutthroat and brook trout from 15.5 miles of Greenhorn Creek, and refound with pure westslope cutthroat trout from up to six Ruby watershed populations.

There is a 30 day comment period for this EA. Written comments can be mailed or emailed to the address below, and must be received by 5:00 pm, July 21, 2013. Please include name and address with any comment.

Matt Jaeger
Montana Fish, Wildlife & Parks
730 ½ N. Montana
Dillon, MT 59725
406-683-9310
mattjaeger@mt.gov

Thank you for your interest.

Sincerely,

Patrick J. Flowers
Region Three Supervisor

Attachment

Montana Fish, Wildlife & Parks (FWP)

1400 South 19th Avenue, Bozeman MT, 59718

Draft Environmental Assessment

Environmental Assessment for the Reintroduction of Native Westslope Cutthroat Trout in Greenhorn Creek by removal of Nonnative Hybrid Rainbow x Cutthroat and Brook Trout with Rotenone

PART I: PROPOSED ACTION DESCRIPTION

A. Type of Proposed Action: Removal of non-native fish followed by native fish species (westslope cutthroat trout) reintroduction.

B. Agency Authority for the Proposed Action:

87-1-702. Powers of department relating to fish restoration and management.
Authority to conduct the proposed actions comes from the Montana Administrative Code (87-1-702). This statute specifically authorizes Montana Fish, Wildlife & Parks (FWP) "to perform such acts as may be necessary to the establishment and conduct of fish restoration and management projects".

87-1-201 FWP powers and duties: The department shall implement programs that:

(i) manage wildlife, fish, game, and nongame animals in a manner that prevents the need for listing under 87-5-107 or under the federal Endangered Species Act, 16 U.S.C. 1531, et seq.;
(ii) manage listed species, sensitive species, or a species that is a potential candidate for listing under 87-5-107 or under the federal Endangered Species Act, 16 U.S.C. 1531, et seq., in a manner that assists in the maintenance or recovery of those species. Section 87-1-201(9)(a) M.C.A.

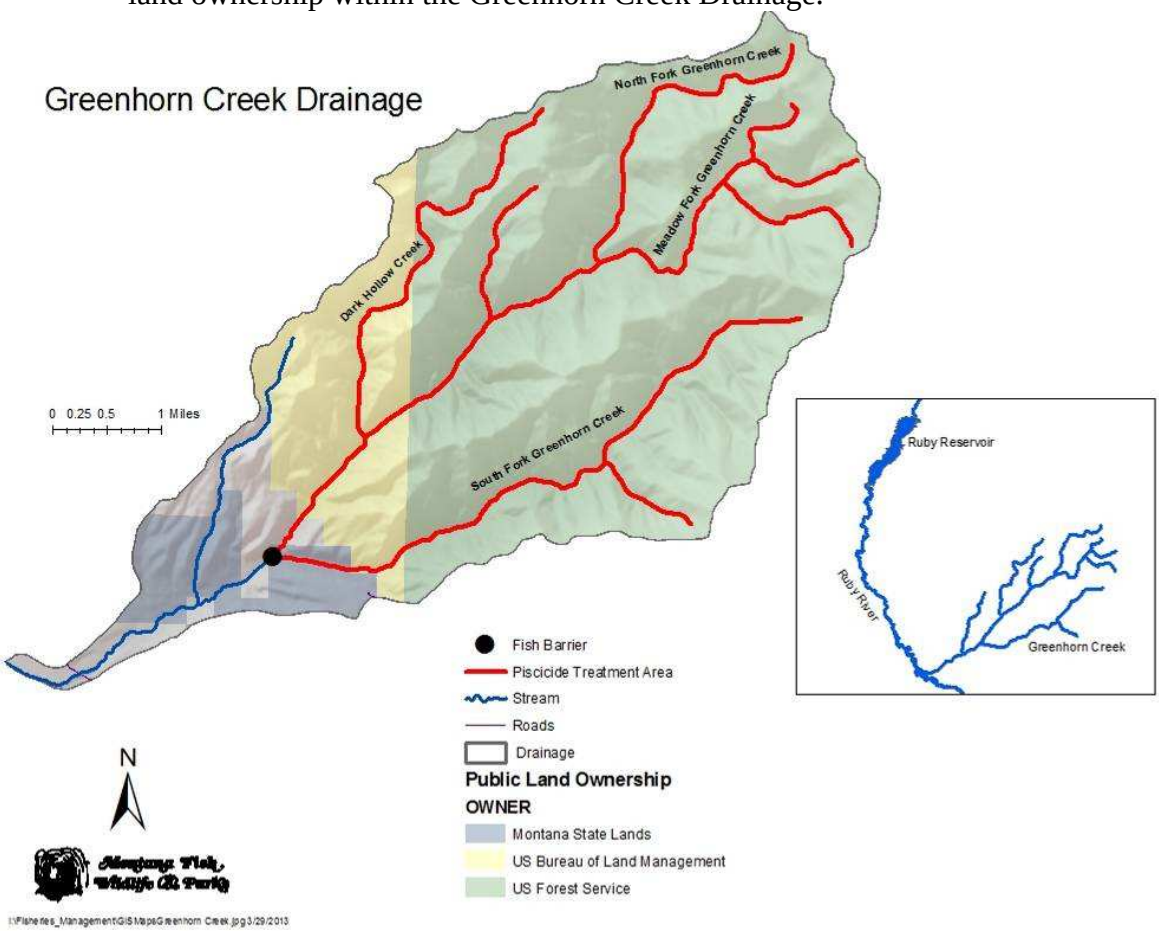
C. Estimated Commencement Date: July 2013. A second treatment may be necessary within the following year after the first treatment to ensure achievement of the desired objective of eradicating nonnative rainbow x cutthroat hybrid and brook trout followed by introduction of westslope cutthroat trout *Oncorhynchus clarkii lewisi*.

D. Location of the Project:
The project site is located in Madison County approximately 15 miles south of the town of Alder, MT; T8S R3W S 3, 4, 5, 7, 8, 9, 10, 15, 16, 17, 18, 19, 20, and 21 and T8S R4W S12, 13, 24, and 25. Greenhorn Creek (including its forks) is a small, southwesterly flowing stream that intersects the Ruby River 62.2 miles upstream of the Ruby Reservoir. Stream discharge measurements are shown in Table 1. The portion of the stream that is proposed for rotenone treatment flows through property managed or owned by the U.S. Forest Service, Madison Ranger District (USFS), Bureau of Land Management, Dillon Field Office (BLM), Montana Department of Natural Resources and Conservation, Dillon Unit Office (DNRC), or the Snowcrest Ranch (Figure 1).

Table 1. Greenhorn Creek watershed stream discharge measurements and locations. Greenhorn Creek stream miles are the distance from the confluence with the Ruby River and Greenhorn Creek tributary stream miles are the distance from the confluence with mainstem Greenhorn Creek.

Location	Date	Stream Mile	Discharge (cfs)
South Fork Greenhorn Creek	August 9, 2012	0.8	2.4
North Fork Greenhorn Creek	August 9, 2012	1.4	1.8
North Fork Greenhorn Creek	August 8, 2012	4.3	0.5
Meadow Fork Greenhorn Creek	August 8, 2012	0.1	0.5
Dark Hollow Creek	August 9, 2012	0.1	0.3

Figure 1. Map depicting the location of Greenhorn Creek within the Ruby River drainage and land ownership within the Greenhorn Creek Drainage.



E. Project Size (acres affected)

1. Developed/residential – 0 acres
2. Industrial – 0 acres
3. Open space/Woodlands/Recreation – 0 acres
4. Wetlands/Riparian – The treated length of Greenhorn Creek and tributaries would be approximately 15.5 stream miles.
5. Floodplain – 0 acres
6. Irrigated Cropland – 0 acres
7. Dry Cropland – 0 acres
8. Forestry – 0 acres
9. Rangeland – 0 acres

F. Overlapping Jurisdictions: U.S. Forest Service - Madison Ranger District, Bureau of Land Management - Dillon Field Office, Montana Department of Natural Resources and Conservation - Dillon Unit Office, and the Snowcrest Ranch.

G. Narrative Summary of the Proposed Action and Purpose of the Proposed Action

The area of the Greenhorn Creek drainage targeted for westslope cutthroat trout (WCT) reintroduction is the fish-occupied habitat in the mainstem of Greenhorn Creek above a constructed fish barrier located at stream mile 3.1 (Figure 2), about 6.2 miles of the North Fork of Greenhorn Creek, 3.4 miles of Dark Hollow Creek, 2.3 miles of the Meadow Fork of Greenhorn Creek, and 5.3 miles of the South Fork of Greenhorn Creek.

Figure 2. Greenhorn Creek fish barrier. This structure will isolate the reintroduced WCT population from non-native fish.

Background and Need for the Proposed Action

Westslope cutthroat trout, Montana's state fish, has declined in abundance, distribution, and genetic diversity throughout its native range (Shepard et al. 2003). Reduced distribution of WCT is particularly evident in the Missouri River drainage of Montana where genetically pure populations are estimated to persist in about four percent of habitat they historically occupied. Major factors contributing to this decline include competition with nonnative brook (*Salvelinus fontinalis*), brown (*Salmo trutta*), and rainbow (*O. mykiss)* trout that were first introduced in Montana in the 1890's, hybridization with rainbow and Yellowstone cutthroat trout (*O. c. bouvieri*), habitat changes, and isolation to small headwater streams. Most remaining WCT populations in the Missouri River drainage, due to these threats, are considered to have a low likelihood of long-term (100 years) persistence unless conservation actions are implemented (Shepard et al. 1997). The U.S. Fish and Wildlife Service has been petitioned to list WCT as a Threatened Species on two occasions but found listing was not warranted stating, "The conservation efforts presently being accomplished as part of the routine management objectives of State and Federal agencies, and as part of formal interagency agreements and plans, provide substantial assurance that the WCT subspecies is being conserved." WCT nevertheless remains a Species of Concern in Montana; projects like the proposed Greenhorn Creek introduction contributing to the species remaining unlisted under the Endangered Species Act.

Establishment of new WCT populations is a high priority for conservation of WCT in Montana (FWP 2007). Objective three of the *Memorandum of Understanding and Conservation Agreement for Westslope Cutthroat Trout and Yellowstone Cutthroat Trout in Montana* is "Seek collaborative opportunities to restore and/or expand each cutthroat trout subspecies into selected suitable habitats within their respective historic ranges." The *Memorandum of Understanding and Conservation Agreement for Westslope Cutthroat Trout and Yellowstone Cutthroat Trout in Montana* was cooperatively developed and signed by American Wildlands, Blackfeet Tribe, Crow Tribe, Confederated Salish and Kootenai Tribes, Federation of Fly-Fishers, Glacier National Park, Greater Yellowstone Coalition, Montana Chapter of the American Fisheries Society, Montana Department of Natural Resources & Conservation, Montana Farm Bureau, Montana Fish, Wildlife & Parks, Montana Stockgrowers Association, Montana Trout Unlimited, Montana Wildlife Federation, Natural Resource Conservation Service, Plum Creek, private landowners, the Bureau of Land Management, the U.S. Fish & Wildlife Service, the U.S. Forest Service, and Yellowstone National Park.

Greenhorn Creek is presently occupied by native sculpin, non-native rainbow x cutthroat hybrid trout, brook trout and, in the headwaters of Dark Hollow Creek and the Meadow Fork, genetically unaltered native WCT. The genetically unaltered WCT populations are presently not isolated from non-native trout in the drainage and both occur with brook trout which places them at high risk of extirpation. The factors that resulted in creation of rainbow x cutthroat hybrid and brook trout populations are unknown, although they likely resulted from previous introductions of rainbow and brook trout elsewhere in the Ruby River watershed and subsequent migration into the Greenhorn Creek drainage.

The preferred donor populations for reestablishment of WCT in Greenhorn Creek, in addition to the two existing genetically pure WCT populations within the Greenhorn Creek drainage, are the only four remaining genetically pure, aboriginal WCT populations in the Ruby watershed. These occur in Jack, Bivens, Geyser and Coal creeks. These populations are each confined to between 1 and 4 miles of stream and are each comprised of fewer than 300 individuals. All of these populations are presently at high risk of extinction because of small population size, amount of available habitat, or the presence of non-native fishes. Successful re-establishment into the Greenhorn Creek drainage would more than double the distribution of secure genetically pure WCT in the Ruby Watershed. Risk of WCT extirpation in Greenhorn Creek would be lower than in its donor populations because it is larger, which reduces effects of demographic, genetic, or catastrophic threats, and the constructed fish barrier prevents upstream fish movement and would isolate restored WCT from non-native fish.

No irrigation withdrawals occur in the project area and land management activities by the USFS, BLM, and DNRC are consistent with native trout conservation goals (see Attachment 1 – letter from USFS and BLM).

There are records of Western toads *Anaxyrus boreas*, which are a Species of Concern, and tiger salamander *Ambystoma maortium* in the Greenhorn Creek drainage. It is also possible that Columbia spotted frogs *Rana luteiventris* are present. Rotenone can cause mortality of these species if exposure occurs at tadpole stages; however, in other rotenone projects in southwest Montana neither adult Columbia spotted frogs nor Western toads exhibited rotenone mortality. It is unlikely that tadpoles or juvenile salamanders will be affected as only stream habitats will be treated and these life stages typically occur only in lotic or standing waters. Adults of all amphibian species will be mobile and able to avoid rotenone-treated water during the time that rotenone would be in the water (late July), simply by moving.

There are no aquatic invertebrate Species of Concern known to inhabit the Greenhorn Creek Drainage according to the Montana Natural Heritage Database. FWP policy nevertheless calls for aquatic invertebrate sampling prior to rotenone application and again one year later.

<u>Proposed Action</u>

The proposed action is to remove all non-native rainbow x cutthroat hybrid and brook trout in the Greenhorn Creek drainage upstream of the fish barrier at mile 3.1 (Figure 1) by using rotenone based piscicides. Treated reaches would include all waters that support non-native fish in stream channels upstream of the barrier (about 15.5 total stream miles). Piscicide would be actively neutralized such that is does not affect fish or aquatic organisms downstream of the fish barrier. The genetically pure WCT populations in the drainage would be salvaged prior to treatment by capturing as many individuals as possible by electrofishing and holding them in untreated sections of stream or springs. Salvaged genetically pure WCT would be released once the treatment has been completed. Genetically pure WCT (live fish eggs) would additionally be introduced from extant populations in the Ruby watershed to create a genetically robust population, possibly for up to five years depending on monitoring results. It is anticipated that WCT would naturally colonize available habitat throughout the

Greenhorn Creek drainage over a several year period after successful WCT augmentation and spawning. Establishment and development of the expanded WCT population would be monitored via electrofishing.

The proposed project would result in a genetically pure WCT population occupying approximately 17.2 miles of stream and would establish the largest genetically pure WCT population in the Ruby River watershed. This project will also more than double the distribution and abundance of secure genetically pure WCT in the Ruby River watershed. A protected, genetically pure WCT population of this size in the Missouri River drainage in Montana is uncommon.

FWP has used rotenone as a fisheries management tool since 1948, principally to improve angling quality or for native fish conservation. Rotenone is a naturally occurring substance derived from the roots of tropical plants in the bean family, such as the jewel vine (*Derris* spp.) and lacepod (*Lonchocarpus* spp.), that are found in Australia, Oceania, southern Asia, and North, South, and Central America. Rotenone has been and still is being used for centuries by native people to capture fish for food in areas where these plants are naturally found. It has been used in fisheries management in North America since the 1930s. Rotenone has also been used as a natural insecticide for gardening and to control parasites such as lice on domestic livestock (Ling 2002).

Rotenone acts by inhibiting oxygen transfer at the cellular level. It is especially effective at low concentrations with fish because it is readily absorbed into the bloodstream through the thin cell layer of the gills. Trout are among the most susceptible species of fish to rotenone. Mammals, birds, and other non-gill breathing organisms do not have this rapid absorption route into the bloodstream and thus can tolerate exposure to concentrations much higher than that used to kill fish.

The State of Arizona in 2011 convened the Rotenone Review Advisory Committee, a group comprised of diverse interests, to extensively study rotenone and the Arizona Game & Fish Department's use of rotenone for fish management projects (Guenther et al. 2011). The committee, including interests initially opposed to rotenone use due to environmental and human health concerns, unanimously concluded that "rotenone is an important fisheries management tool that can be used safely and effectively" and affirmed the Arizona Game & Fish Department's position that rotenone is an important fisheries management tool. The committee was composed of members of the Arizona State Senate and House of Representatives, Arizona departments of Agriculture, Environmental Quality, Game & Fish, Health Services, Water Resources, municipalities, various private interests including law firms and sportsman and agricultural interests, and federal agencies such as the U.S. Forest Service, the U.S. Fish & Wildlife Service, the Bureau of Land Management, and the Environmental Protection Agency. The press release and committee report are available at *http://azgfd.net/artman/publish/NewsMedia/Advisory-panel-affirms-Strict-Game-and-Fish-procedures-assure-that-rotenone-is-a-safe-effective-fisheries-management-tool.shtml*.

Specifics of the Proposed Treatment

The boundaries for this treatment and subsequent WCT re-introduction would include the entirety of the Greenhorn Creek Drainage upstream of the fish barrier at stream mile 3.1 (Figure 1).

Genetically pure WCT would be captured by electrofishing prior to applying rotenone to the stream and held in untreated reaches or off-channel habitat for re-introduction after completion of the rotenone treatment. Rainbow x cutthroat hybrid and brook trout would be removed by applying rotenone to Greenhorn Creek upstream of the fish barrier. Rainbow x cutthroat or brook trout in July 2012 occupied the South Fork of Greenhorn Creek to mile 5.3, the North Fork to mile 6.2, the Meadow Fork to mile 2.3, and Dark Hollow Creek to mile 1.8. The total stream length treated, based on this fish distribution, would be about 15.5 miles. Up to an additional 2 miles of stream may require treatment if fish ascend further upstream than the 2012 survey indicated.

Perennial sections of the stream would be treated with a diluted rotenone liquid mixture using constant flow stations (Figure 3) as well as backpack sprayers to treat disconnected waters, slow moving stream margins, and backwaters where the mainstem waters may not mix well. Treatment of these areas is essential for two reasons: 1) as fish begin to feel the effects of rotenone, they move to stream margins or calm water areas to seek refuge, and 2) if they detect the rotenone in the water, they tend to seek out waters where they do not detect it. The rotenone formulation that would be used at Greenhorn Creek was developed specifically to minimize the likelihood of detection. The effects of rotenone can be reversed if fish can access untreated water. Stream water would be used to dilute rotenone in the backpack sprayers and the constant flow stations.

Figure 3. A constant flow station.

The identified stream reaches would be treated with a rotenone based piscicide, likely CFT Legumine ™ 5% or Prenfish ™ 5% liquid rotenone. Springs and seeps may be treated with Prentox™ 7% powdered rotenone "doughballs" (a mixture of sand, gelatin, and powdered rotenone). The toxic effects of the rotenone would be contained within the boundaries of the project area.

On-site assays using caged fish (bioassays) would determine the appropriate rotenone concentration and treatment times necessary to cause mortality of the rainbow x cutthroat hybrid and brook trout. A bioassay is conducted by applying the anticipated maximum necessary rotenone concentration at one site for four or eight hours and measuring the response of sentinel fish at various distances downstream to determine how far the rotenone remains effective. The bioassay would be terminated at four hours if sentinel fish are showing mortality within that time period. The treatment would continue to the eight-hour mark if they are not showing mortality within four hours. Mortality occurred in previous projects within four hours of exposure to one ppm rotenone in bioassays.

Sentinel fish are simultaneously exposed to various concentrations of rotenone in aerated buckets to determine the minimum effective rotenone concentration. The effective concentration is expected to be consistent with the label recommendations for concentrations for "normal pond use" (i.e., 0.5 to 1 part per million [ppm] liquid rotenone, which is 0.025 to 0.050 ppm active rotenone). Streams similar to Greenhorn Creek where rotenone has been used to remove nonnative trout species required no more than 1.0 ppm liquid rotenone. Sculpins have survived treatments using 1.0 ppm in all instances where this has occurred. Salvaged WCT would be released once sentinel trout have survived for four hours post-treatment.

Rotenone would be primarily applied through the use of constant flow stations. Each constant flow station dispenses a precise amount of diluted rotenone into the stream (Figure 4) based on measured stream discharge. Liquid rotenone would be applied to the stream at regularly spaced intervals based on the bioassays expected to be no more frequent than a two hour stream travel time. The duration of the application would also be determined by the bioassays, but based on previous experience would likely be no more than four hours.

Figure 4. Photo showing trickle of rotenone/water mix (outlined by the yellow box) being applied to a stream.

FWP anticipates the entire chemical treatment can be completed in about one week, but may require several additional days to complete 2013 surveys prior to the project show fish distribution has expanded beyond that found in 2012. Treatments would start in the upstream reaches and progress downstream. Block nets would be placed in the stream overnight to prevent fish from moving into previously treated stream reaches. Fresh water from untreated areas upstream would begin to dilute the piscicide concentration at treatment end each day, and oxidation would continue to break down remaining rotenone in the treated reaches of Greenhorn Creek. Active neutralization at the fish barrier with potassium permanganate would additionally continue until sentinel fish posted immediately upstream of the neutralization station survive for a minimum of four hours indicating a sub-lethal concentration of rotenone.

Previous treatments at other locations have shown that fish killed by rotenone rapidly decay and are difficult to find even after a few days post treatment. Significant accumulations of dead fish above the barrier would be collected and dispersed in the stream to reduce attractiveness to scavengers. Information regarding human and animal consumption of rotenone exposed fish is discussed in Part III, section 8, Risk/Health Hazards.

A second treatment may be necessary approximately one year after the first treatment to ensure achievement of the desired objective of eradicating nonnative rainbow x cutthroat and brook trout. Effectiveness of the treatment would be ascertained through electrofishing surveys of the treated sections of Greenhorn Creek and associated tributaries. The same treatment, safety measures, and precautions used during the first treatment would be utilized during the second treatment if it is necessary.

Neutralization of the rotenone would begin immediately at or downstream of the fish barrier. Rotenone treated water passing the fish barrier (Figures 1 and 2) would be neutralized by

applying potassium permanganate to the stream (Figure 5) per FWP policy. Potassium permanganate is widely used to treat wastewater and rapidly oxidizes and breaks down in natural streams, though its application initially turns the water purple (Figure 6). According to the CFT Legumine label, potassium permanganate should be applied to water at the appropriate concentration to compensate for organic demand of the stream so that enough remains to neutralize the rotenone. Previous projects conducted in southwest Montana found that 2 to 5 ppm potassium permanganate has been sufficient to achieve neutralization of 1 ppm rotenone within ½ hour of contact time, in some instances less than 15 minutes. The discharge of the stream would be measured prior to treatment and the potassium permanganate would be applied at an appropriate rate to meet organic demands and to neutralize the rotenone. Potassium permanganate requires 15 to 30 minutes of contact time to fully neutralize rotenone which will occur within 1/4 to 1/2 mile below the fish barrier in Greenhorn Creek. Because Greenhorn Creek does not reach the Ruby River for an additional 3.1 miles, adequate travel time to fully neutralize rotenone before it contacts other streams exists.

The effectiveness of the potassium permanganate at neutralizing rotenone would be measured using 2 methods: caged fish at 30 minutes travel time below the neutralization station would be used to measure the toxicity of the water to ensure neutralization objectives have been met, and a colorimeter would be used to measures surplus potassium permanganate concentration in the stream.

A potassium permanganate concentration of 0.5 – 1.0 ppm at 30 minutes below the neutralization site ensures that neutralization is adequate. Trout serve as an excellent indicator of rotenone presence in the water because they are one of the most sensitive animals to rotenone (i.e., they are affected by a much lower rotenone concentration than most other test animals; Schnick 1974).

Figure 5. Neutralization system using potassium permanganate

Figure 6. A stream turned purple by potassium permanganate applied to neutralize rotenone.

For situations where stream travel time is less than 12 hours from the lowermost point of rotenone application to the neutralization station, which is expected to be the situation in Greenhorn Creek, FWP policy is as follows:

Step 1: Sentinel fish must be placed immediately above the neutralization station.

Step 2: Start neutralization 2 hours before the theoretical arrival time of the rotenone when the travel time is 4 hours or less from the lowest point in the drainage where rotenone is being applied to the neutralization station. Start neutralization at a time equal to ½ the theoretical arrival time when travel time is more than 4 hours. Start the neutralization 4 hours before the theoretical arrival time, for example, if there is 8 hours of travel time.

Step 3: Neutralization must be continued until the last of the rotenone has theoretically passed the neutralization station (calculated as the time of last application of rotenone plus the travel time to reach neutralization station), and then stopped only after sentinel fish placed immediately above the neutralization station survive an additional 4 hours without stress.

FWP would use caged fish immediately above the neutralization station after completion of the rotenone application in order to evaluate when the waters are no longer toxic to fish. The CFT Legumine label specifies that once caged fish show no signs of distress for 4 hours, the stream water is considered to no longer be toxic and neutralization can be discontinued. Past FWP projects conducted in Montana have shown that this label procedure is accurate.

WCT would be re-introduced into the treated reaches of Greenhorn Creek through release of salvaged fish and transfer of genetically pure fish or eggs from selected donor stream(s) once all treatments are complete. Transfers would follow all FWP policies for wild fish transfers, including as necessary consultation with the FWP Fish Health Committee, completion of a wild fish transfer request, disease testing, and genetic testing.

Benefits of the Proposed Action

The primary purpose of this project is to help achieve the goal of ensuring the long-term, self-sustaining presence of WCT in the upper Missouri River drainage by establishing and securing a genetically pure WCT population in the Greenhorn Creek drainage. The benefits of the proposed effort of successful removal of nonnative trout would include:

- Fulfilling the State's obligation to restore and expand remnant genetically pure WCT populations (FWP 2007).
- Reducing threats that may encourage requests for listing WCT under the Endangered Species Act.
- Securing two genetically pure WCT populations presently at high risk of extirpation.
- Increasing the number of genetically pure WCT populations in the Ruby watershed from six to seven.
- Increasing the distribution of aboriginal Ruby watershed WCT from 9.9 miles of stream to 25.5 miles.
- Replicating genetically pure WCT and thereby reducing the likelihood of extirpating rare Ruby watershed WCT through drought, fire, disease, and other genetic and demographic threats to small, isolated populations.
- Establishing a source of genetically pure WCT that could be used to assist in additional WCT restoration efforts.
- Helping to achieve the management goal for cutthroat trout in Montana of long-term, self-sustaining persistence across the species historic range.

PART II. ALTERNATIVES

Alternative 1 – No Action

The no action alternative would be to cease efforts to establish and secure genetically pure WCT in Greenhorn Creek. Selection of this alternative would not fulfill the State's obligation to restore and expand existing remnant genetically pure WCT populations (FWP 2007), and would not reduce threats to the species that encourage requests for listing WCT under the Endangered Species Act. The two genetically pure WCT populations in the Greenhorn Creek drainage would eventually be extirpated and replaced by non-native rainbow x cutthroat hybrid and brook trout.

Alternative 2 (Proposed Action) – Removal of non-native rainbow x cutthroat hybrid and brook trout with rotenone and transfer of genetically pure WCT into Greenhorn Creek

The proposed action would include salvage of genetically pure WCT, removal of existing non-native rainbow x cutthroat hybrid and brook trout from Greenhorn Creek upstream of the barrier at stream mile 3.1 with rotenone, and subsequent restocking of the treated portions of

the drainage with genetically pure WCT salvaged from the Greenhorn Creek drainage and from the selected donor stream(s).

Alternative 3 – Electrofishing removal of rainbow x cutthroat hybrid and brook trout followed by transfer of genetically pure WCT into Greenhorn Creek

Complete removal of non-native rainbow x cutthroat hybrid and brook trout by electrofishing was determined not to be a feasible alternative for restoring WCT in Greenhorn Creek and was eliminated from further consideration. Multiple-pass electrofishing has been used to eradicate unwanted trout (primarily nonnative brook trout) from short sections of several small streams in northcentral Montana (Big Coulee, Middle Fork Little Belt, and Cottonwood creeks) and in southwest Montana (Muskrat, Whites and Staubach creeks). Electrofishing was used annually from 2004 to 2010 to remove brook trout from approximately 6 miles of Dyce Creek west of Dillon. It is estimated through 2010 that this effort reduced Dyce Creek brook trout abundance by 80 - 95%, but due to the complexity of the stream habitat (e.g., over hanging vegetation and debris jams) and length of the project reach (6 miles), it was not expected that brook trout could be completely eradicated using only electrofishing (Paul Hutchinson, Fisheries Biologist, BLM Dillon District, personal communication). Continued electrofishing removal efforts in Dyce Creek would have required significant labor resources on an annual basis for an indefinite period of time. Rotenone was used to remove the remaining brook trout from Dyce Creek in August 2011 and 2012. Electrofishing efforts following treatment found no brook trout in the Dyce Creek treatment area. The Meadow Fork of Greenhorn Creek was similarly electrofished to remove brook trout from 2008 to 2012. Brook trout were not eradicated because of stream complexity though their abundances were reduced during this time period. The size of the proposed Greenhorn Creek project area (15.5 stream miles and higher base flows than Dyce Creek) would require annual labor-intensive multiple-pass electrofishing efforts that would not result in complete removal of the non-native rainbow x cutthroat hybrid and brook trout. Complete removal of non-native rainbow x cutthroat hybrid and brook trout by electrofishing, therefore, was determined not to be a feasible alternative for restoring WCT in Greenhorn Creek.

PART III. ENVIRONMENTAL REVIEW

A. PHYSICAL ENVIRONMENT

1. LAND RESOURCES **Will the proposed action result in:**	**IMPACT Unknown**	**None**	**Minor**	**Potentially Significant**	**Can Impact Be Mitigated**	**Comment Index**
a. Soil instability or changes in geologic substructure?		X				
b. Disruption, displacement, erosion, compaction, moisture loss, or over-covering of soil which would reduce productivity or fertility?		X				
c. Destruction, covering or modification of any unique geologic or physical features?		X				
d. Changes in siltation, deposition or erosion patterns that may modify the channel of a river or stream or the bed or shore of a lake?		X				
e. Exposure of people or property to earthquakes, landslides, ground failure, or other natural hazard?		X				

2. WATER Will the proposed action result in:	IMPACT Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment Index
a. Discharge into surface water or any alteration of surface water quality including but not limited to temperature, dissolved oxygen or turbidity?			X		YES	2a
b. Changes in drainage patterns or the rate and amount of surface runoff?		X				
c. Alteration of the course or magnitude of flood water or other flows?		X				
d. Changes in the amount of surface water in any water body or creation of a new water body?		X				
e. Exposure of people or property to water related hazards such as flooding?		X				
f. Changes in the quality of groundwater?		X				2f
g. Changes in the quantity of groundwater?		X				
h. Increase in risk of contamination of surface or groundwater?			X		YES	see 2a,f
i. Effects on any existing water right or reservation?		X				2i
j. Effects on other water users as a result of any alteration in surface or groundwater quality?			X		YES	2j
k. Effects on other users as a result of any alteration in surface or groundwater quantity?		X				
l. Will the project affect a designated floodplain?		X				
m. Will the project result in any discharge that will affect federal or state water quality regulations? (Also see 2a)			X		YES	2m

Comment 2a: The proposed project is designed to intentionally introduce a piscicide to surface water to remove non-native fish. The impacts would be short term and minor. Prentox (7% powder) and CFT Legumine (5% liquid) rotenone are EPA registered piscicides and are safe to use for removal of unwanted fish. The concentration of CFT Legumine (5% liquid) proposed is 0.5 to1 part per million. Prentox (7% powder) may be used on a very limited basis in a sand and gelatin mix to treat any springs and seeps within the treatment area.

There are three ways in which rotenone can be neutralized once applied. The most common method is to allow natural breakdown to occur. Rotenone is a compound that is susceptible to natural breakdown (detoxification) through a variety of mechanisms such as water chemistry,

water temperature, exposure to organic substances, exposure to air, and sunlight intensity (Ware 2002; ODFW 2002; Loeb and Engstrom-Heg 1971; Engstrom-Heg 1972; Gilderhus et al. 1986). Rotenone persistence studies by Gilderhus et al. (1986) and Dawson et al. (1991) found that in cool water temperatures of 32 to 46° F the half-life of rotenone ranged from 3.5 to 5.2 days. Gilderhus et al. (1986) reported that 30% mortality was experienced in rainbow trout exposed to degrading concentrations of actual rotenone (0.004 ppm) in 46° F pond water 14 days after a treatment. The concentrations were sub lethal to trout by day 18. The second method for neutralization involves dilution by untreated water. This may be accomplished by ground water or untreated surface water flowing into a lake or stream. The final method of neutralization involves the application of an oxidizing agent such as potassium permanganate. This dry crystalline substance is mixed with stream or lake water to produce a concentration of liquid sufficient to neutralize the rotenone. Neutralization is accomplished after about 15-30 minutes of exposure time between the two compounds (Prentiss Inc. 2007).

Potassium permanganate, in the case of Greenhorn Creek, would be used to neutralize the rotenone as it passes the barrier. FWP expects the treated stream above the barrier to naturally detoxify within 48 hours after rotenone application ceases. Treated waters have detoxified within 24 hours after cessation of rotenone application during previous treatments on other streams, as untreated water from upstream sources flows into the treated area and through the aforementioned physical and chemical breakdown processes. Inert ingredients (e.g., carriers) in liquid rotenone volatilize rapidly in the environment by both photolysis and hydrolysis and therefore do not pose a threat to the environment at the levels proposed for fish eradication. It is anticipated that most dead fish would be left on-site in the water. Previous treatments have shown that fish rapidly decay and are difficult to find even after a few days post treatment. Dead fish additionally provide nutrients to the stream benefiting primary and secondary production. Large accumulations of dead fish, however, would be collected and dispersed throughout the system to avoid attracting scavengers.

Comment 2f: No contamination of groundwater is anticipated to result from this project. Rotenone binds readily to sediments, and is broken down by soil and in water (Skaar 2001; Engstrom-Heg 1971, 1976; Ware 2002). Rotenone moves only one inch in most soil types; the only exception would be sandy soils where movement is about three inches (Hisata 2002). California studies where wells were placed in aquifers adjacent to and downstream of rotenone applications have never detected rotenone, rotenolone, or any of the other organic compounds in the formulated products (CDFG 1994). Case studies in Montana have concluded that rotenone movement through groundwater does not occur. A study at Tetrault Lake, Montana, for example, detected neither rotenone nor inert ingredients in a nearby domestic well which was sampled 2 and 4 weeks after applying 90 ppb rotenone to the lake. This well was chosen because it was down gradient from the lake and drew water from the same aquifer that fed and drained the lake. A Kalispell-area pond in 1998 was treated with Prenfish 5% rotenone. Water from a well located 65 feet from the pond was analyzed, and no sign of rotenone was detected. Another Kalispell-area pond in 2001 was treated with Prenfish 5% rotenone. Water from a well located 200 feet from that pond was tested 4 times over a 21 day period and showed no sign of contamination. FWP in 2005 treated a small pond near Thompson Falls with Prenfish to remove pumpkinseeds and bass. A well located 30 yards from the pond was tested, and neither Prenfish nor inert ingredients were found in the well.

Inert ingredients in CFT Legumine volatilize rapidly in the environment by both photolysis and hydrolysis and therefore do not pose a threat to the environment at the levels proposed for fish eradication.

Comment 2i: Introduction of WCT and establishment of a WCT population would have no affect on water rights.

Comment 2j: The CFT Legumine and Prentox labels state "….Do not use water treated with rotenone to irrigate crops or release within 1/2 mile upstream of a potable water or irrigation water intake in a standing body of water such as a lake, pond or reservoir…". Irrigation and stockwater are not withdrawn from Greenhorn Creek upstream of the fish barrier. The treatment zone would be thoroughly posted to caution against use of the water while rotenone is being applied (two to four days) and thereafter for a precautionary period – four to six days total. Finally, rotenone passing downstream of the lower bounds of the treatment area (below the fish barrier; Figure 1) would be neutralized with the addition of potassium permanganate to the stream. Total impacts to irrigation and potable water intakes would be short term and minor and would be mitigated as necessary.

Comment 2m: FWP would apply for a Notice of Intent (NOI) for a Pesticide General Permit from Montana DEQ.

3. AIR **Will the proposed action result in:**	**IMPACT Unknown**	**None**	**Minor**	**Potentially Significant**	**Can Impact Be Mitigated**	**Comment Index**
a. Emission of air pollutants or deterioration of ambient air quality? (also see 13 (c))		X				
b. Creation of objectionable odors?			X		yes	3b
c. Alteration of air movement, moisture, or temperature patterns or any change in climate, either locally or regionally?		X				
d. Adverse effects on vegetation, including crops, due to increased emissions of pollutants?		X				
e. Will the project result in any discharge which will conflict with federal or state air quality regulations?		X				

Comment 3b: CFT Legumine does not contain the same level of aromatic petroleum solvents (toluene, xylene, benzene and naphthalene) of other rotenone formulations and as a consequence does not have the same odor concerns and has less inhalation risks. Dead fish would result from this project and may cause objectionable odors as they decay, though previous treatments have shown fish decay rapidly and are difficult to find even after a few days post treatment.

4. VEGETATION Will the proposed action result in:	IMPACT Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment Index
a. Changes in the diversity, productivity or abundance of plant species (including trees, shrubs, grass, crops, and aquatic plants)?			X			4a
b. Alteration of a plant community?		X				
c. Adverse effects on any unique, rare, threatened, or endangered species?		X				
d. Reduction in acreage or productivity of any agricultural land?		X				
e. Establishment or spread of noxious weeds?		X				
f. Will the project affect wetlands, or prime and unique farmland?		X				

Comment 4a: Prior to and during treatment there would be some human trampling of vegetation along the stream during the placement and monitoring of constant flow stations and sentinel fish locations. Rotenone does not have an effect on plants at concentrations used to kill fish. Impacts from trampling vegetation are expected to be short term and minor.

5. FISH/WILDLIFE Will the proposed action result in:	IMPACT Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment Index
a. Deterioration of critical fish or wildlife habitat?		X				
b. Changes in the diversity or abundance of game animals or bird species?			X		YES	5b
c. Changes in the diversity or abundance of nongame species?			X		YES	5c
d. Introduction of new species into an area?		X				5d
e. Creation of a barrier to the migration or movement of animals?		X				
f. Adverse effects on any unique, rare, threatened, or endangered species?			X		YES	5f
g. Increase in conditions that stress wildlife populations or limit abundance (including harassment, legal or illegal harvest or other human activity)?		X				5g
h. Will the project be performed in any area in which T&E species are present, and will the project affect any T&E species or their habitat? (Also see 5f)		X				
i. Will the project introduce or export any species not presently or historically occurring in the receiving location? (Also see 5d)		X				See 5d

Comment 5b: The proposed action would result in establishment or replication of a new genetically pure westslope cutthroat trout population in Greenhorn Creek and the removal of an existing non-native rainbow x cutthroat hybrid and brook trout population that occupies approximately 15.5 miles of stream. The introduced WCT population would be expected to occupy a similar distribution.

The proposed removal of non-native rainbow x cutthroat hybrid and brook trout from Greenhorn Creek is considered a minor impact because the current use of the rainbow x cutthroat hybrid and brook trout fishery is nominal (based on angler use data), and non-native rainbow x cutthroat hybrid and brook trout would continue to be abundant throughout the Ruby watershed and in numerous other streams in the upper Missouri River basin. The project is intended to increase the abundance and range of genetically pure WCT, a rare and unique species with limited distribution in the Ruby watershed and upper Missouri River drainage. Westslope cutthroat trout are currently protected by catch-and-release regulations in most streams in the central fish district including all streams within the Ruby watershed. Restoration efforts like the proposed action are intended to increase overall WCT abundance which may result in greater fishing opportunities and harvest of this rare native species in the future.

Comment 5c: Nongame (non-target) animals that could be directly impacted by the proposed project include aquatic invertebrates and amphibians. The expected population level impacts to non-target organisms as described below range from non-existent to short-term and minor. Western toads were the only Species of Concern (SOC), and no Threatened and Endangered (T&E) species were identified in the Greenhorn Creek Drainage in a search of the Montana Natural Heritage database.

Aquatic Invertebrates:

Numerous studies indicate that rotenone has temporary or minimal effects on aquatic invertebrates. One study reported that no significant reduction in aquatic invertebrates was observed due to the effects of rotenone which was applied at levels twice as high as the levels proposed for this project (Houf and Campbell 1977). Chandler and Marking (1982) found that clams and snails were between 50 and 150 times more tolerant than fish to Noxfish (5% rotenone formulation). The reduction of aquatic invertebrates in all cases was temporary, and most treatments used a higher concentration of rotenone than proposed for this project (Schnick 1974). Engstrom-Heg et al. (1978) reported in a study on the relative tolerance of different aquatic invertebrates to rotenone, that the long-term impacts of rotenone are mitigated because those insects that were most sensitive to rotenone also tended to have the highest rate of recolonization. Temporary changes in aquatic invertebrate community structure due to a rotenone treatment could be similar to what is observed after natural (e.g., fire) and anthropogenic (livestock grazing) disturbances (Wohl and Carline 1996; Mihuc and Minshall 1995; Minshall 2003), although the physical impacts and resulting modifications of invertebrate assemblages after these types disturbances can last for a much longer period than a piscicide treatment.

Aquatic invertebrates are capable of rapid recovery from disturbance (Boulton et al. 1992; Matthaei et al. 1996) because of their short life cycles (Anderson and Wallace 1984), good dispersal ability (Pennack 1989), and generally high reproductive potential (Anderson and Wallace 1984). Headwater reaches of Greenhorn Creek that do not hold fish or only hold genetically pure WCT would not be treated with rotenone and would provide a source of aquatic invertebrate colonists. Recolonization would additionally include aerially dispersing invertebrates from downstream areas (e.g., mayflies, caddisflies).

The FWP Piscicide Policy requires sampling for Species of Concern (SOC) and benthic macroinvertebrates prior to and following a treatment. No SOC, as stated above, were identified in the Greenhorn Creek Drainage in a search of the Montana Natural Heritage database.

Aquatic invertebrates in southwest Montana are routinely collected prior to transfers of WCT to historically fishless habitat in headwater mountains streams (e.g., Eureka, Little Tepee, Little Tizer, Elkhorn, Crazy, Whitehorse creeks). These collections in all cases have shown aquatic invertebrate assemblages typical of headwater streams in western Montana, and in no cases have threatened or endangered species been discovered. The same type of aquatic invertebrate assemblage would be expected in Greenhorn Creek, which was not historically fishless, and the possibility of eliminating a rare or endangered species is very unlikely.

Mammals and Birds

Mammals are generally not affected by rotenone treatments because they neutralize rotenone by enzymatic action in their stomach and intestines (AFS 2002). Laboratory tests by Marking (1988) fed forms of rotenone to rats and dogs as part of their diet for periods of six months to two years and observed effects such as diarrhea, decreased food consumption, and weight loss. He reported that despite unusually high treatment concentrations of rotenone in rats and dogs, it did not cause tumors or reproductive problems in mammals. Studies of risk for terrestrial animals found that a 22 pound dog would have to drink 7,915 gallons of treated lake water within 24 hours, or eat 660,000 pounds of rotenone-killed fish, to receive a lethal dose (CDFG 1994). The State of Washington reported that a half pound mammal would need to consume 12.5 mg of pure rotenone to receive a lethal dose (Bradbury 1986). A half pound animal would need to drink 66 gallons of water treated at 1 ppm to receive a fatal dose, considering the only conceivable way an animal can ingest rotenone under field conditions is by drinking lake or stream water.

The EPA (2007) made the following conclusion for small mammals and large mammals;

> *When estimating daily food intake, an intermediate-sized 350 g mammal will consume about 18.8 g of food. Using data previously cited from the common carp with a body weight of 88 grams, a small mammal would only consume 21% (18.8/88) 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 (39.5 mg/kg * 0.350 kg = 13.8 mg = 13,800 μg) for similarly sized mammals. When assessing a large mammal, 1000 g is considered to be a default body weight. A 1000 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 (30.4 mg/kg * 1 kg = 30.4 mg = 30,400 μg). Although fish are often collected and buried to the extent possible following a rotenone treatment, even if fish were available for consumption by mammals scavenging along the shoreline for dead or dying fish, it is unlikely that piscivorous mammals will consume enough fish to result in observable acute toxicity.*

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). The results, however, have been challenged on the basis of methodology because: 1) the continuous intravenous injection method used in the study leads to "continuously high levels of the compound in the blood," and 2) dimethyl sulfoxide (DMSO) was used to enhance tissue penetration (normal routes of exposure actually slow introduction of chemicals into the bloodstream). Finally, 3) injecting rotenone into the body is not a normal way of assimilating the compound. Similar studies (Marking 1988) have found no Parkinson-like results. Extensive research has demonstrated that rotenone does not cause birth defects (HRI 1982), gene mutations (Van Goethem et al.

1981; BRL 1982), or cancer (Marking 1988). Rotenone was found to have no direct role in fetal development of rats that were fed excruciatingly high concentrations of rotenone. Spencer and Sing (1982) reported that rats that were fed diets laced with 10-1000 ppm rotenone over a 10 day period did not suffer any reproductive dysfunction. Typical concentrations of actual rotenone used in fishery management range from 0.025 to 0.50 ppm and are far below that administered during most toxicology studies.

Similar results determined that birds required levels of rotenone at least 1,000 to 10,000-times greater than what is required for lethality in fish (Skaar 2001). Cutkomp (1943) reported that chickens, pheasants, and members of lower orders of *Galliformes* were quite resistant to rotenone, and four day old chicks were more resistant than adults. Ware (2002) reports that swine are uniquely sensitive to rotenone and it is slightly toxic to wildfowl, but to kill Japanese quail required 4500 to 7000 times more than is used to kill fish.

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

> *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, protocols for piscicidal use typically recommend that dead fish be collected and buried, rendering the fish less available for consumption (see Section IV). In addition, many of the dead fish will sink and not be available for consumption by birds. However, whole body residues in fish killed with rotenone ranged from 0.22 μg/g in yellow perch (Perca flavescens) to 1.08 μg/g in common carp (Cyprinus carpio) (Jarvinen and Ankley 1998). For a 68 g yellow perch and an 88 g carp, this represents totals of 15 μg and 95 μg rotenone per fish, respectively. Based on the avian subacute dietary* LC_{50} *of 4110 mg/kg, a 1000-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.*

A reduced abundance of aquatic invertebrates and fish may temporally impact local mammals and birds that may prey on these species (e.g, American dipper and mink). The aquatic invertebrate community would recover rapidly from a piscicide treatment while it would be several years for trout abundance to reach levels present prior to treatment. Impacted birds and mammals are mobile and would likely use untreated portions of the Greenhorn Creek drainage, adjacent drainages, or the Ruby River until full recovery of the Greenhorn Creek aquatic assemblage.

Donnelly (pers. comm.) found that American dippers in the Cherry Creek drainage exhibited slightly reduced body condition factor the summer after a fall rotenone treatment but fully recovered the year after. He found no effect on reproductive success such as clutch size, chick survival, or chick body condition.

A compilation of scientific documentation regarding the food habits of mink indicates that mink are generalists in their diet (Novak 1987). This compilation includes studies conducted in Montana and documents that mammals are the most important mink prey item throughout the

year followed by birds and invertebrates. Fish replace birds and invertebrates as the second most important food item in the winter. Mink tend to utilize coarse, slow moving fish rather than faster midstream fish, such as trout, indicating that trout are more likely to escape mink predation even if they are the only fish available. The ability of the mink to utilize a wide variety of prey bases may reduce competition with more specialized carnivores. Mink are also known to readily colonize new habitat and to rapidly recolonize habitat where they have been absent.

Amphibians and Reptiles

Amphibians and reptiles potentially found within the Greenhorn Creek treatment area include Western toads (*Anaxyrus boreas*), tiger salamander (*Ambystoma maortium*), Columbia spotted frogs (*Rana luteiventris*) (amphibians), western terrestrial garter (*Thamnophis elegans*), common garter (*T. sirtalis*), and rubber boa (*Charina bottae*) snakes (reptiles). Rotenone can be toxic to gill-breathing larval amphibians though air breathing adults are less sensitive. Chandler and Marking (1982) found that Southern leopard frog tadpoles were between 3 and 10 times more tolerant than fish to Noxfish (5% rotenone formulation). Grisak et al. (2007) conducted laboratory studies on long-toed salamanders, Rocky Mountain tailed frogs (*Ascaphus truei*), and Columbia spotted frogs and concluded that the adults of these species would not suffer an acute response to Prenfish at trout killing concentrations (0.5-1 mg/L) but the larvae would likely be affected. Billman (2010) applied CFT Legumine (5% rotenone) to a lake in Yellowstone National Park (YNP) in 2006 containing stocked Yellowstone cutthroat trout and to two fishless ponds on the Flying D Ranch in southwestern Montana in 2008. Rotenone caused nearly 100% mortality in gill-breathing amphibian tadpoles within 24 hours following application, but did not affect non-gill breathing metamorphs, juveniles, and adults. Tadpole repopulation occurred in the year(s) following at all treated water bodies, and population levels were similar to or, in the case of YNP, higher than pre-treatment levels.

These authors recommended implementing rotenone treatments at times when the larvae are not present, such as the fall, to reduce the chance of exposure to rotenone treated water and potential impacts to larval amphibians. A fall treatment date is not possible because of heavy use of the drainage for hunting and recreation; however, the Greenhorn Creek treatment would not include habitats where larval amphibians occur. Little to no effect on amphibians as such is expected because of the low sensitivity of adults to rotenone. A reduced abundance of aquatic invertebrates may temporally impact larval amphibians that prey on these species though the aquatic invertebrate community would recover rapidly. Reptiles (air-breathing) would not be directly impacted by rotenone treatment, though snakes are known to consume trout which would be temporarily reduced in number by the rotenone treatment.

Based on the information presented in comment 5c, FWP would expect population level impacts to non-target organisms to range from non-existent to short term and minor. These impacts may include temporary loss or diminishment of a food source during recolonization of aquatic invertebrate communities and WCT. FWP would assess the environmental impacts of this project on non-target organisms by monitoring the aquatic invertebrate community with samples collected pre- and post-treatment.

Comment 5d: Genetically pure WCT would be transferred (live fish or eyed eggs) from the selected donor stream(s) or propagation facility (Sun Ranch Hatchery) after all non-native fish are removed. Transfers would follow all FWP policies for wild fish transfers including consultation with the MT Fish Health Committee, completion of a wild fish transfer request, and disease/genetic testing..

Comment 5f: There are no threatened or endangered species known to reside in the proposed treatment area in Greenhorn Creek. Some sensitive terrestrial species that may occasionally occupy the Greenhorn Creek drainage and could potentially ingest dead fish or treated stream water include great gray owls (*Strix nebulosa*), golden eagles (*Aquila chrysaetos*), northern goshawk (*Accipiter gentilis)*, gray wolf (*Canis lupus*), grizzly bears (*Ursus arctos horribilis*), and wolverines (*Gulo gulo*). Fish do not comprise a significant part of the diet of most of these species, and none of these species, or other mammals and birds common to the area, would be affected by ingestion of dead fish or treated stream water (see comment 5c).

Western Pearlshell Mussels have not been documented in the Greenhorn Creek Drainage.

Western toads (*Anaxyrus boreas*) are a Species of Concern and been observed in the Greenhorn Creek drainage. Rotenone can be toxic to gill-breathing larval amphibians, as previously discussed in Comment 5c, though air breathing adults are less sensitive and the Greenhorn Creek treatment would not include in habitats where larval toads occur. This will likely eliminate potential impacts to larval Western toads. Any reduction in amphibian abundance would be expected to be short term and minor because of the low sensitivity of adults to rotenone. Juvenile amphibians have been exposed to similar concentrations of rotenone in other WCT restoration projects and shown little or no affect.

Comment 5i. See comment 5d.

B. HUMAN ENVIRONMENT

6. NOISE/ELECTRICAL EFFECTS **Will the proposed action result in:**	**IMPACT Unknown**	**None**	**Minor**	**Potentially Significant**	**Can Impact Be Mitigated**	**Comment Index**
a. Increases in existing noise levels?			X			6a
b. Exposure of people to serve or nuisance noise levels?		X				
c. Creation of electrostatic or electromagnetic effects that could be detrimental to human health or property?		X				
d. Interference with radio or television reception and operation?		X				

Comment 6a: The noise generated from this project would be short term, minor, and in an isolated area.

7. LAND USE Will the proposed action result in:	IMPACT Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment Index
a. Alteration of or interference with the productivity or profitability of the existing land use of an area?		X				7a
b. Conflicted with a designated natural area or area of unusual scientific or educational importance?		X				
c. Conflict with any existing land use whose presence would constrain or potentially prohibit the proposed action?					X	7c
d. Adverse effects on or relocation of residences?		X				

Comment 7a: Existing land use practices, grazing standards, season of grazing, and grazing load would not be affected by removal of non-native rainbow x cutthroat and brook trout and subsequent introduction and establishment of a WCT population.

Comment 7c: The Greenhorn Creek drainage can be accessed by public roads, though the majority of the treatment area is not directly accessible by road. The project area, as required by EPA regulation, would be closed to the public during the period that rotenone remains fatal to fish. Proper warning through news releases, signing the project area, road closure, and administrative personnel in the project area should be adequate to keep recreationists from unintentionally accessing the area and being exposed to any treated waters or dead fish. Stream water would not be toxic to wildlife, livestock, or humans at proposed treatment levels. No livestock are scheduled to be on either private pastures or USFS, BLM, or DNRC allotments occurring in the treatment area in 2013, so they would not be exposed to the rotenone treatment.

8. RISK/HEALTH HAZARDS Will the proposed action result in:	IMPACT Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment Index
a. Risk of an explosion or release of hazardous substances (including, but not limited to oil, pesticides, chemicals, or radiation) in the event of an accident or other forms of disruption?			X		YES	8a
b. Affect an existing emergency response or emergency evacuation plan or create a need for a new plan?			X		YES	8b
c. Creation of any human health hazard or potential hazard?			X		YES	see 8a,c
d. Will any chemical toxicants be used?			X		YES	see 8a

Comment 8a: The principal risk of human exposure to hazardous materials from this project would be limited to the applicators. All applicators would wear safety equipment required by the product labels and the material safety data sheet (MSDS) such as respirator, goggles, rubber boots, protective clothing, and Nitrile gloves. All applicators would be trained on the safe handling and application of the piscicide and potassium permanganate. At least one and most likely several Montana Department of Agriculture-certified pesticide applicators would supervise and administer the project. Materials would be transported, handled, applied, and stored according to the label specifications to reduce the probability of human exposure or spill.

Comment 8b: FWP requires a treatment plan for rotenone projects. This plan addresses many aspects of safety for people who are on the implementation team such as establishing a clear chain of command, training, delegation and assignment of responsibility, clear lines of communication between members, spill contingency plan, first aid, emergency responder information, personal protective equipment, and monitoring and quality control, among others. Implementing this project should not have any impact on existing emergency plans. The risk of emergency response is minimal and any affects to existing emergency responders would be short term and minor due to the fact that an implementation plan has been developed by FWP.

Comment 8c: The EPA (2007) conducted an analysis of the human health risks for rotenone and concluded it has a high acute toxicity for both oral and inhalation routes, but has a low acute toxicity for dermal route of exposure. It is not an eye or skin irritant nor a skin sensitizer. The EPA could not provide a quantitative assessment of potentially critical effect on neurotoxicity risks to rotenone users, so a number of uncertainty factors were assigned to the rating values. They are: a 10x database uncertainty factor, a 10x inter-species uncertainty factor and a 10x intra-species uncertainty factor. The target margin of exposure (MOE) is 1000. These uncertainty factors have been applied to protect against potential human health effects. It is also important to note that many toxicity studies involve subjecting laboratory specimens to unusually high concentrations of rotenone, or conducting tests on animals that would not normally be exposed to rotenone during use in fisheries management. Table 2 summarizes the EPA toxicological endpoints of rotenone (from EPA 2007).

Rotenolenoids are common degradation products found in the parent plant material used to make piscicidal forms of rotenone. The EPA (2007) concluded these degradation products are no more toxic than the active ingredient.

The EPA analysis of acute dietary risk for both food and drinking water concluded;

> *"…When rotenone is used in fish management applications, food exposure may occur when individuals catch and eat fish that either survived the treatment or were added to the water body (restocked) prior to complete degradation. Although exposure from this route is unlikely for the general U.S. population, some people might consume fish following a rotenone application. EPA used maximum residue values from a bioaccumulation study to estimate acute risk from consuming fish from treated water bodies. This estimate is considered conservative because the bioaccumulation study measured total residues in edible portions of fish including certain non-edible portions*

(skin, scales, and fins) where concentrations may be higher than edible portions (tissue) and the Agency assumed that 100% of fish consumption could come from rotenone exposed fish. In addition, fish are able to detect rotenone's presence in water and, when possible, attempt to avoid the chemical by moving from the treatment area. Thus, for partial kill uses, surviving fish are likely those that have intentionally minimized exposure.

Acute exposure estimates for drinking water considered surface water only because rotenone is only applied directly to surface water and is not expected to reach groundwater. The estimated drinking water concentration (EDWC) used in dietary exposure estimates was 200 ppb, the solubility limit of rotenone. The drinking water risk assessment is conservative because it assumes water is consumed immediately after treatment with no degradation and no water treatment prior to consumption.
Acute dietary exposure estimates result in dietary risk below the Agency's level of concern. Generally, EPA is concerned when risk estimates exceed 100% of the acute population adjusted dose (aPAD). The exposure for the "females 13-49 years old" subgroup (0.1117 mg/kg/day) utilized 74% of the aPAD (0.015 mg/kg/day) at the 95th percentile. It is appropriate to consider the 95th percentile because the analysis is deterministic and unrefined. Measures implemented as a result of this RED will further minimize potential dietary exposure (see Section IV)..."

Table 2. EPA toxicological endpoints of rotenone (from EPA 2007).

Exposure Scenario	**Dose Used in Risk Assessment, Uncertainty Factor (UF)**	**Level of Concern for Risk Assessment**	**Study and Toxicological Effects**
Acute Dietary (females 13-49)	NOAEL = 15 mg/kg/day UF = 1000 aRfD = 15 mg/kg/day = 0.015 mg/kg/day 1000	Acute PAD = 0.015 mg/kg/day	Developmental toxicity study in mouse (MRID 00141707, 00145049) LOAEL = 24 mg/kg/day based on increased resorptions
Acute Dietary (all populations)	An appropriate endpoint attributable to a single dose was not identified in the available studies, including the developmental toxicity studies.		
Chronic Dietary (all populations)	NOAEL = 0.375 mg/kg/day UF = 1000 cRfD = 0.375 mg/kg/day = 0.0004 mg/kg/day 1000	Chronic PAD = 0.0004 mg/kg/day	Chronic/oncogenicity study in rat (MRID 00156739, 41657101) LOAEL = 1.9 mg/kg/day based on decreased body weight and food consumption in both males and females
Incidental Oral Short-term (1-30 days) Intermediate-term (1-6 months)	NOAEL = 0.5 mg/kg/day	Residential MOE = 1000	Reproductive toxicity study in rat (MRID 00141408) LOAEL = 2.4/3.0 mg/kg/day [M/F] based on decreased parental (male and female) body weight and body weight gain
Dermal Short-, Intermediate-, and Long-Term	NOAEL = 0.5 mg/kg/day 10% dermal absorption factor	Residential MOE = 1000 Worker MOE = 1000	Reproductive toxicity study in rat (MRID 00141408) LOAEL = 2.4/3.0 mg/kg/day
Inhalation Short-term (1-30 days) Intermediate-term (1-6 months)	NOAEL = 0.5 mg/kg/day 100% inhalation absorption factor	Residential MOE = 1000 Worker MOE = 1000	[M/F] based on decreased parental (male and female) body weight and body weight gain
Cancer (oral, dermal, inhalation)	Classification; No evidence of carcinogenicity		

UF = uncertainty factor, NOAEL = no observed adverse effect level, LOAEL = lowest observed adverse effect level, aPAD = acute population adjusted dose, cPAD = chronic population adjusted does, RfD = reference dose, MOE = margin of exposure, NA = Not Applicable

The EPA acknowledges the four principle reasons for concluding there is a human chronic risk from exposure to rotenone treated water: First, the rapid natural degradation of rotenone, the use of active neutralization measures by applicators, such as potassium permanganate, third, by properly following piscicide labels which prohibit the use near water intakes, and finally,

the proper signing, public notification, or area closures which would limit public exposure to rotenone treated water.

The EPA concludes no recreational exposure risk to adults who enter treated water following the application through dermal contact and/or incidental ingestion, but requires a waiting period of three days after a treatment before toddlers swim in treated water. The aggregate risk to human health from food, water, and swimming does not exceed the EPA level of concern (EPA 2007).

Fisher (2007) conducted an analysis of the inert constituent ingredients found in the rotenone formulation of CFT Legumine for the California Department of Fish and Game. These inert ingredients are principally found in the emulsifying agent Fennodefo[99] which helps make the generally insoluble rotenone more soluble in water. The constituents were considered because of their known hazard status and not because of their concentrations in the Legumine formulation. Solvents such as xylene, trichloroethylene (TCE), and tetrachloroethylene are residue left over from the process of extracting rotenone from the root and can be found in some lots of Legumine. Inconsistent detectability, however, 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. The human health risk is low, however, because of their low concentrations in this formulation. The remaining constituents, the fatty acid esters, resin acids, glycols, substituted benzenes, and 1-hexanol, were likewise present but were 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 good 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 nine percent of the formulation (Fisher 2007). Regarding the constituent ingredients in Legumine, the analysis 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 (polyethylene glycol) are highly soluble, have very low volatility, and are rapidly biodegraded within a matter of days. The fatty acids in the fatty acid ester mixture (Fennodefo99™) do not exhibit significant volatility, are virtually insoluble, and are readily biodegraded, although likely over a slightly longer period of time than the PEGs in the mixture. None of the new compounds identified exhibit persistence or are known to bioaccumulate. Under conditions that would favor groundwater exchange the highly soluble PEGs could feasibly transmit to groundwater, but the concentrations in the reservoir, and the rapid biodegradation of these constituents makes this scenario extremely unlikely. Based upon a review of the physical chemistry of the chemicals identified, we conclude that they are rapidly biodegraded, hydrolyzed and/or otherwise photolytically oxidized and that the 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 water, or ingestion exposure scenarios and no relevant regulatory criteria are exceeded in estimated exposure concentrations…"

The Legumine MSDS states "…when working with an undiluted product in a confined space, use a non-powered air purifying respirator…and… air-purifying respirators do not protect workers in oxygen-deficient atmospheres…" It is not likely that workers would be handling Legumine in an oxygen deficient space during normal use. Proper ventilation and safety equipment would be used according to the label requirements to guard against this, however.

The advantage of CFT Legumine over Prenfish, another liquid rotenone product, is that CFT Legumine has less petroleum hydrocarbon solvents such as toluene, xylene, benzene, and naphthalene. Prenfish, by comparison, has a strong chemical odor. CFT Legumine is virtually odor-free and performs almost identically to Prenfish. Prentox, or powdered rotenone, is simply the ground up roots of the *Derris* plant, and as a consequence contains no petroleum or other man-made ingredients. The toxicity of Prentox is therefore attributed exclusively to the rotenoid compounds.

Teixeira et al. (1984) in their description of how South American Indians prepare and apply *Timbó*, a rotenone parent plant, reported that the Indians extensively handled the plants during a mastication process (chewing), and then swam in lagoons to distribute the plant pulp. No harmful effects were reported. It is important to note that the primitive method of applying rotenone from root does not involve a calculated target concentration, metering devices, or involve human health risk precautions as those involved with fisheries management programs.

Several studies have evaluated incidence of development of Parkinson's disease (PD) following exposure to a variety of pesticides, including rotenone. The results of epidemiological studies of pesticide exposure 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). The state of Arizona conducted an exhaustive review to 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 re-registration 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."

The occupational risks to humans from rotenone application is low if proper safety equipment and handling procedures are followed as directed by the product labels (EPA 2007). The major risks to human health from rotenone come from accidental exposure during handling and application. This is the only time when humans are exposed to concentrations that are greater than that needed to remove fish. The Montana Department of Agriculture, to prevent accidental exposure to liquid formulated or powdered rotenone, requires applicators to be:

- *Trained and certified to apply the pesticide in use*
- *Equipped with the proper safety gear, which, in this case, includes respirator, eye protection, rubberized gloves, hazardous material suit*
- *Have product labels with them during use*
- *Contain materials only in approved containers that are properly labeled*
- *Adhere to the product label requirements for storage, handling, and application*

FWP also imposes additional requirements on its employees such as progressive professional training, experience and training requirements for achieving and maintaining progressive Levels of Expertise, and ensuring that all required treatment actions are completed. These actions include, but are not limited to: ensuring proper public notification and signing of the treatment area, ensuring that all rotenone applicators properly use personal protective equipment, properly measuring the volume of water to be treated and calculating the appropriate quantity of rotenone to be applied, ensuring that initiation and cessation of neutralization follows FWP procedures, and ensuring that non-target organism monitoring is conducted.

Areas treated with rotenone would be closed to public access during the treatment in order to reduce the potential for exposure of the public during the proposed use of CFT Legumine. Signs would be placed at access points informing the public of the closure and the presence of rotenone treated waters. Personnel would be onsite to inform the public and escort them from the treatment area should they enter. Potassium permanganate would neutralize any remaining rotenone before it leaves the project area. The efficacy of the neutralization would be monitored using fish (the most sensitive species to the chemical) and a hand held chlorine meter (chlorimeter). The potential for public exposure to rotenone treated waters, therefore, is very minimal.

9. <u>COMMUNITY IMPACT</u> **Will the proposed action result in:**	**IMPACT Unknown**	**None**	**Minor**	**Potentially Significant**	**Can Impact Be Mitigated**	**Comment Index**
a. Alteration of the location, distribution, density, or growth rate of the human population of an area?		X				
b. Alteration of the social structure of a community?		X				
c. Alteration of the level or distribution of employment or community or personal income?		X				
d. Changes in industrial or commercial activity?		X				
e. Increased traffic hazards or effects on existing transportation facilities or patterns of movement of people and goods?		X				

10. PUBLIC SERVICES/TAXES/UTILITIES Will the proposed action result in:	IMPACT Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment Index
a. Will the proposed action have an effect upon or result in a need for new or altered governmental services in any of the following areas: fire or police protection, schools, parks/recreational facilities, roads or other public maintenance, water supply, sewer or septic systems, solid waste disposal, health, or other governmental services? If any, specify: _____		X				
b. Will the proposed action have an effect upon the local or state tax base and revenues?		X				
c. Will the proposed action result in a need for new facilities or substantial alterations of any of the following utilities: electric power, natural gas, other fuel supply or distribution systems, or communications?		X				
d. Will the proposed action result in increased used of any energy source?		X				
e. Define projected revenue sources		X				10e.
f. Define projected maintenance costs		X				

Comment 10e. No additional funding beyond routine budget levels will be necessary to conduct this project or monitor results and no revenue will be generated by this project. Estimated costs for rotenone and potassium permanganate are $375 and $480, respectively. Adequate quantities of both items are currently on-hand, remaining from previously conducted FWP projects.

11. AESTHETICS/RECREATION Will the proposed action result in:	IMPACT Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment Index
a. Alteration of any scenic vista or creation of an aesthetically offensive site or effect that is open to public view?		X				
b. Alteration of the aesthetic character of a community or neighborhood?		X				
c. Alteration of the quality or quantity of recreational/tourism opportunities and settings? (Attach Tourism Report)			X		yes	See 11c
d. Will any designated or proposed wild or scenic rivers, trails or wilderness areas be impacted? (Also see 11a, 11c)		X				

Comment 11c: There would be a temporary loss of angling opportunity in the upper Greenhorn Creek drainage between the time of fish removal and for several years (three to seven) until genetically pure WCT have been reestablished to similar abundances throughout the drainage. The rainbow x cutthroat hybrid and brook trout fishery would be eliminated above the barrier, though rainbow x cutthroat hybrid and brook trout fisheries would remain in numerous streams throughout the Ruby watershed. Cutthroat trout fisheries in Montana streams in most cases are catch and release only. FWP would evaluate whether the fishery could support harvest once WCT are established in the Greenhorn Creek drainage, and if possible, regulations would be changed to allow anglers the option of harvesting WCT for consumption.

12. CULTURAL/HISTORICAL RESOURCES **Will the proposed action result in:**	**IMPACT Unknown**	**None**	**Minor**	**Potentially Significant**	**Can Impact Be Mitigated**	**Comment Index**
a. Destruction or alteration of any site, structure or object of prehistoric historic, or paleontological importance?		X				
b. Physical change that would affect unique cultural values?		X				
c. Effects on existing religious or sacred uses of a site or area?		X				12c
d. Will the project affect historic or cultural resources?		X				

Comment 12 c. The project site is located within the aboriginal range of several Native American tribes. Cultural officers for tribes which would have interest in this project will be contacted through the MEPA public comment process to identify any potential effects on existing religious or sacred uses of the area. There would be no ground breaking activities associated with this project, and there are no known potential impacts to historical, cultural or religious values.

13. SUMMARY EVALUATION OF SIGNIFICANCE Will the proposed action, considered as a whole:	IMPACT Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment Index
a. Have impacts that are individually limited, but cumulatively considerable? (A project or program may result in impacts on two or more separate resources which create a significant effect when considered together or in total.)			X			
b. Involve potential risks or adverse effects which are uncertain but extremely hazardous if they were to occur?		X				
c. Potentially conflict with the substantive requirements of any local, state, or federal law, regulation, standard or formal plan?		X				
d. Establish a precedent or likelihood that future actions with significant environmental impacts will be proposed?		X				
e. Generate substantial debate or controversy about the nature of the impacts that would be created?	X				Yes	13e
f. Is the project expected to have organized opposition or generate substantial public controversy? (Also see 13e)	X					13f
g. List any federal or state permits required.						13g

Comment 13a: Completion of this project will increase the cumulative distribution and abundance of pure WCT in the Ruby Watershed, thereby reducing risk of extinction and fulfilling FWP's obligations to "to perform such acts as may be necessary to the establishment and conduct of fish restoration and management projects" and "manage wildlife, fish, game, and nongame animals in a manner that prevents the need for listing under 87-5-107 or under the federal Endangered Species Act." Individuals or fertilized eggs from an enlarged, pure WCT population in Greenhorn Creek may also be used in future WCT restoration projects elsewhere.

Comments 13e and f: FWP has a long history of completing rotenone projects; however, the use of piscicides can generate angst among some people. It is not known if this project would have organized opposition. FWP will hold a public open house meeting concerning the project during the public comment period, if there appears to be sufficient interest. FWP has also worked closely with the local USFS and BLM staff and private landowners during the development of this project, and no significant issues have been identified.

Comment 13g: FWP consulted with the USFS Madison Ranger District and BLM Dillon Field Office during the planning and development phases of this project. No special use permit is required by FWP. The following permit would be required from the Montana Department of Environmental Quality:

- Notice of Intent under the Montana DEQ Pesticide General Permit

PART IV. ENVIRONMENTAL ASSESSMENT CONCLUSION SECTION

A) *Is an Environmental Impact Statement Required (EIS)?*

No. An EIS is not required under the Montana Environmental Policy Act (MEPA) because the project lacks significant impacts to the physical, biological or human environment. Impacts of the proposed action are expected to be short-term and minor, and are appropriately addressed through an Environmental Assessment.

B) *Public involvement:*

The public will be notified through local newspapers and through contact with local landowners, sporting and recreational groups, and others who have previously indicated interest in similar projects. This EA will also be published on the Montana Fish, Wildlife & Parks web page (http://fwp.mt.gov/default.html). The public comment period will be open for 30 days. This level of public involvement is believed adequate for the proposed project as recent and similar type piscicide efforts completed by FWP have produced no significant issues or controversy.

C) *Addresses to submit written comments:*

There is a 30 day comment period for this EA. Written comments can be mailed or emailed to the address below, and must be received by 5:00 pm, July 21, 2013. Please include name and address with any comment.

Matt Jaeger
Montana Fish, Wildlife & Parks
730 ½ N. Montana
Dillon, MT 59725
406-683-9310
mattjaeger@mt.gov

D) *Name, title, address, and telephone number of the person responsible for preparing this EA document:*

Same as above.

E) *Agencies contributing to the document:*

U.S. Forest Service, Madison Ranger District (USFS), Bureau of Land Management, Dillon Field Office (BLM), and Montana Department of Natural Resources and Conservation, Dillon Unit Office (DNRC).

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Attachment 1:

Project support letters from the USFS and BLM

USDA United States Department of Agriculture | Forest Service | Beaverhead-Deerlodge National Forest Madison Ranger District | 5 Forest Service Road Ennis MT 59729 406-682-4253

File Code: 2670
Date: June 04, 2013

Matt Jaeger
Montana Fish, Wildlife & Parks
730 ½ N. Montana
Dillon, MT 59725

Dear Mr. Jaeger:

This letter is to inform you of the Madison Ranger District's support of the "Reintroduction of Native Westslope Cutthroat Trout in Greenhorn Creek by removal of Nonnative Hybrid Rainbow x Cutthroat and Brook Trout with Rotenone" project. Westslope cutthroat trout (WCT) conservation is an area of emphasis for the Fisheries Program on the Beaverhead-Deerlodge National Forest, and the District is pleased to be a partner with Montana Fish, Wildlife and Parks (MFWP) on this project.

The Madison Ranger District (MRD) strives to meet WCT restoration and conservation goals and I believe our land management direction is consistent with your efforts to expand and secure cutthroat trout populations across the District. We will continue to emphasize consistent implementation of that direction and look forward to working with you on this and future projects to move toward accomplishing the goals and objectives set forth in the 2007 MOU and Conservation Agreement for Cutthroat Trout. Once nonnative trout species are removed and WCT are established in Greenhorn Creek, the MRD intends to implement road improvements that will improve water quality, and assess the need for stream enhancement projects to increase the quantity and quality of pool and spawning habitat in the upper headwaters.

The District appreciates MFWP's commitment to native species restoration on National Forest lands and is eager to work cooperatively with MFWP Region 3 fisheries staff throughout all phases of the Greenhorn Creek Project.

If you have any questions, please feel free to contact the MRD fisheries biologist, Darin Watschke, at (406) 682-4253.

Sincerely,

Ken Harris
District Ranger

Cc:
Travis Horton, Montana Fish, Wildlife and Parks
Darin Watschke, Beaverhead-Deerlodge NF
Jim Brammer, Beaverhead-Deerlodge NF

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Dillon Field Office
1005 Selway Drive
Dillon, Montana 59725-8449
www.Bureau of Land Management.gov/mt

In Reply Refer To:

6600 (MTB050)

June 10, 2013

Montana Fish, Wildlife and Parks
Region 3 – Bozeman
1400 South 19th
Bozeman, Montana 59718

Dear Fish, Wildlife and Parks:

The Bureau of Land Management, Dillon Field Office, is in full support of the Greenhorn Creek westslope cutthroat trout Restoration Project in the Ruby Drainage. The Bureau of Land Management is committed to the restoration of native species such as westslope cutthroat trout and is prepared to assist Montana Fish, Wildlife and Parks in this project. With the very limited distribution of this native trout in South West Montana, projects such as this are essential to the long term preservation of the species.

The Dillon Field Office has been actively conducting projects to benefit native westslope cutthroat trout in southwest Montana for over a decade. Over the last ten years the Dillon Field Office has been working to preserve westslope cutthroat trout populations and habitat within the Ruby watershed. The Dillon Field Office has implemented livestock management using a rest rotation system on westslope streams in the area. This rotation allows for livestock use one out of every three years on several allotments with streams that support westslope cutthroat trout. Additionally, within the greater project area, the Dillon Field Office has been actively participating in non-native salmonid suppression efforts in the Dark Hollow and Greenhorn drainages. Projects such as the Greenhorn Creek Restoration are consistent with the long term fishery management goals of the Bureau of Land Management Dillon Field Office.

Sincerely,

Cornie Hudson

Cornie Hudson
Field Manager