

**United States Department of the Interior
Bureau of Land Management**

**Programmatic Environmental Assessment
for Colorado Parks & Wildlife Fish Reclamation Projects on
BLM Managed Lands in Colorado**

Colorado State Office
Lakewood, Colorado

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INTRODUCTION AND BACKGROUND

Historically it was believed that the state of Colorado contained one native trout species, the cutthroat trout (*Oncorhynchus clarkii*), that was further broken down into four subspecies: the now extinct Yellowfin Cutthroat Trout believed native to Twin Lakes in the Arkansas River watershed, the Greenback Cutthroat Trout native to the South Platte River watershed, the Rio Grande Cutthroat Trout native to the Rio Grande River watershed, and the Colorado River Cutthroat Trout native to the major rivers in Colorado's west slope as well as portions of Utah and Wyoming. Based on recent genetics (Metcalf et al. 2012) and meristics (Bestgen et al. 2013) research, it is apparent that six genetically distinct lineages of cutthroat trout were once found within the major river basins in Colorado – the same four noted above except that Colorado River Cutthroat Trout have been divided into two distinct lineages: blue and green, and the now extinct San Juan River Cutthroat Trout.

Historical introductions of non-native trout species have resulted in the extinction and decline of native cutthroat trout subspecies and lineages in Colorado. Recent emphasis has been put on managing for genetically pure cutthroat populations of the four remaining subspecies/lineages within their native basins of origin:

- Rio Grande Cutthroat Trout – Rio Grande River basin
- Colorado River Cutthroat Trout Blue Lineage – White and Yampa river basins
- Colorado River Cutthroat Trout Green Lineage – Colorado, Dolores, and Gunnison river basins
- Greenback Cutthroat Trout – South Platte River basin

Nonnative trout species are the primary threat to the long-term viability and persistence of native cutthroat trout populations in Colorado. Nonnative trout compete for limited resources (food, space, cover), displace native cutthroat to marginal habitats, replace native cutthroats resulting in localized extirpations, and in the case of species in the same genera (rainbow trout and other nonnative cutthroat trout species), can hybridize with native cutthroat trout.

Colorado Parks & Wildlife (CPW) is the state agency responsible for management of fish and wildlife in Colorado. They are the agency charged with initiating and completing fish reclamation projects. To bolster native cutthroat populations and preserve genetically pure populations for the future, CPW in cooperation with the Bureau of Land Management (BLM), United States Forest Service (USFS), and other federal and non-governmental partners, are continually looking to reclaim select waters by extirpating nonnative fish species.

Reclamation entails chemically treating and removing non-native fish from suitable waters in order to reintroduce native cutthroat trout. These chemical treatments are largely a CPW action. However, a BLM authorization is required via the issuance of a pesticide use permit (PUP) to CPW to chemically treat waters located on BLM managed lands. It is BLM policy that issuance of a PUP be tied to a NEPA analysis document, so an Environmental

Assessment has been prepared in the past in order to authorize chemical treatments on BLM managed lands.

CPW follows a detailed standardized protocol (Finlayson et al. 2010) for these treatments, and it is essentially the same action on any given stream. The effects (or lack thereof) are the same or very similar across the landscape. This lends itself well to a programmatic approach to analyzing the effects of these activities on BLM-managed lands in Colorado.

Although this document is focused on chemical treatments associated with reclamation or introduction efforts for native cutthroat trout, there are instances in which CPW may want to remove select aquatic species of management interest for other reasons or to benefit species other than native cutthroat trout. The same methodologies would be utilized to remove any nonnative or undesired fish species and this PEA is intended to cover those removal actions as well (e. g. chemical treatment to remove white suckers from a managed trout stream). Native cutthroat trout are the focus because it is anticipated that this species would be associated with the vast majority of proposed reclamation work across the state.

PURPOSE AND NEED FOR THE ACTION

The primary purpose of this Programmatic Environmental Assessment (PEA) for chemical reclamation treatments is to streamline the process by which the BLM authorizes CPW to release chemical piscicides (fish specific toxicants) into waters located on BLM-managed lands.

CPW and the BLM both place importance on the management of native fish in Colorado. Managing for native, genetically pure fish populations is a priority. The BLM and CPW are both signatories to the Range-Wide Colorado River Cutthroat Trout Conservation Agreement and Strategy (CRCT Conservation Team, 2006), the Conservation Agreement and Strategy for Rio Grande Cutthroat Trout, as well as signatory members of the greenback cutthroat trout recovery team. BLM and CPW are also signatories to the Range-wide Three Species (Bluehead Sucker, Flannelmouth Sucker, Roundtail Chub) Conservation Agreement and Strategy (Utah Dept. of Natural Resources, 2006). The primary goal of these documents and teams is to assure the long-term prosperity of native, genetically pure fish populations within their native ranges. The chemical treatment of streams to remove nonnative fish would aid in reestablishing and maintaining important native fish populations and may help to preclude the need to place select species, subspecies, and lineages under the protection of the Endangered Species Act or for currently listed species, subspecies, or lineages, help to down-list or remove them from the list of federally threatened or endangered species.

DECISION TO BE MADE

The BLM will decide whether to authorize chemical treatments in waters located on BLM managed lands across the state at the programmatic level, and if so, under what terms and conditions.

AREA OF CONSIDERATION

The area of consideration in this PEA includes streams, rivers, and lakes that harbor fish on BLM-managed lands in the state of Colorado. It may also include waters that were historically fishless (e.g. streams above natural barriers), but that now contain nonnative fish and provide suitable habitat for native fish species where introduction efforts could aid in population expansion. Most waters proposed for reclamation are small, discrete systems that are identified as priority during multi-agency Geographical Management Unit (GMU) team meetings that occur annually. Members of the GMU team include state and federal biologist for select geographical areas within the state and in the adjacent states of Utah and Wyoming where watershed boundaries overlap.

DURATION OF UTILITY

This PEA would be considered valid until new information on unanticipated effects from rotenone are identified, CPW makes substantial changes to its treatment protocol, or there are changes in law, regulation, or policy that would affect the utility of this document.

DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

PROPOSED ACTION

The proposed action would apply to streams and rivers determined by CPW and the BLM as suitable for nonnative fish removal. In addition, these waters would be selected based on the assumption that target fish could be effectively removed via the methods discussed below. It is possible that select stream treatments would not be applicable under this PEA and would require their own separate and site specific analysis. Each proposed treatment involving stream reaches managed by the BLM would be looked at to determine this document's adequacy in facilitating a streamlined approval.

Once a suitable stream is selected for reclamation efforts, the following CPW actions would occur and would require authorization by the BLM:

Chemical Treatment.

CPW would write a detailed Reclamation Plan for the specific water of interest with specific details on chemical treatment procedures, protocols, and plans. CPW uses the U. S. Environmental Protection Agency (EPA) approved piscicide (fish toxicant) rotenone to eradicate target nonnative fishes. The chemical treatment would follow a stream treatment specific Reclamation Plan. Rotenone formulations commonly used by CPW in fish reclamation projects include: CFT Legumine™, Liquid Rotenone 5.0% Active Ingredient, (EPA Registration No.: 75338-2); Cube Root Rotenone, Wettable Powdered Rotenone 7.4% Active Ingredient, (EPA Registration No.: 655-691), and Prentox Synpren-Fish Toxicant, Liquid 2.5% Active Ingredient, (EPA Registration No.: 655-421). CPW generally uses CFT Legumine™, Liquid Rotenone 5.0% Active Ingredient, (EPA Registration No.: 75338-2) for most projects. Rotenone is used by CPW as the chemical of choice because of its

effectiveness in eradicating fish and its lack of long-term effects on the environment (Sousa et al 1987). Rotenone is a naturally occurring plant derived fish toxicant that is toxic only to fish, some aquatic invertebrates, and some juvenile amphibians. The EPA found it to be non-toxic to humans, other mammals, and birds at the concentrations used to remove fish (EPA 2007). It has been widely used in the United States since the 1950's. CPW has used rotenone successfully in many similar projects and has refined application techniques to minimize adverse effects to the environment.

Potassium permanganate (KMnO₄) would be used by CPW to neutralize rotenone at a primary detoxification station at the lower terminus of the treatment reach to prevent the movement/effects of rotenone into non-target waters. Potassium permanganate was selected because it is a strong oxidizer that breaks down into potassium, manganese, and water. All are common in nature and have no deleterious environmental effects at the concentrations that would be used for project activities (Finlayson et al. 2000). Potassium permanganate is used as an oxidizing agent in treatment plants to purify drinking water (EPA 1999). Although the oxidation process is not immediate, neutralization should occur within an estimated 0.25 to 0.5 miles of the neutralization site. The equipment required to operate the main detoxification station consists of water tanks, small gasoline powered water pumps, constant head delivery valves, and flexible tubing.

Chemical Application.

CPW follows the American Fisheries Societies Rotenone Standard Operating Procedures (SOP) Manual titled *Planning and Standard Operating Procedures for the Use of Rotenone in Fish Management* (Finlayson et al. 2010). Liquid rotenone would be applied under the supervision of certified CPW personnel at a rate of 1.0-2.0 parts per million (ppm). Amounts of chemical are based primarily on water flow volumes at the time of treatment. The rotenone would be applied using a combination of small 1 gallon water dispensers with constant flow drip-heads at a determined number of drip stations throughout the treatment area over a 3 to 24 hour period. The number of drip stations is based on the length of treatment reach and rate of water travel. Personnel on foot would utilize pressurized backpack sprayers, spraying a diluted solution of rotenone into the stream primarily along low and zero velocity flow water margins, at springs and seeps, and small ponded areas. Bagged concentrations of time release rotenone may be used at spring sources and standing water locations.

Cages of live sentinel fish are collected and placed just upstream of drip stations to help monitor rotenone treatment effectiveness. These live fish (bioassays) help personnel monitor chemical effectiveness between stations, with all live cage fish expected to die within four to eight hours of chemical treatment. Caged fish would also be placed at sites below the primary detoxification station to monitor detoxification success. Block nets may be placed up and downstream of the primary detoxification station to collect dead fish that might otherwise drift downstream and outside of the project area.

Depending on stream access, remoteness, and habitat complexity, two rotenone treatments could be completed back to back to better ensure a successful treatment. All work would be

conducted during daytime hours by personnel on foot. Most projects would occur during the routine business week (Monday – Friday) to reduce potential recreational user conflicts. The number of personnel needed for a particular treatment is based on the length and complexity of the stream treatment reach, number of drip stations needed, number of backpack sprayers needed, number of detoxification personnel needed, and ancillary personnel at first aid stations, sentinel fish observers, and overhead. There would be a minimum of one certified applicator per 15 people. All chemical treatment work would generally be done on foot and vehicles would be parked along existing roads and equipment walked in as needed.

Rotenone would be neutralized by CPW using potassium permanganate at a primary detoxification station located at the downstream terminus of the treatment reach. A detoxicant/oxidizing solution of potassium permanganate (KMnO_4) would be applied at a rate of 2.0-4.0 ppm through a constant head delivery device, while the stream is being treated with rotenone. Stream flow would be measured prior to and during treatment to ensure the accurate delivery of the detoxicant solution. Calculations regarding the volume of potassium permanganate required for use during this project are based upon desired KMnO_4 concentration (2.0-4.0 ppm) and stream flow. Potassium permanganate would be applied within 200 feet of the downstream end of treatment. The detoxicant generally requires approximately 30 minutes of contact time to fully oxidize rotenone, depending on water temperatures and organic composition of the water and stream channel. A CPW aquatic researcher would be present to monitor rotenone concentrations upstream and downstream of the potassium permanganate application site to ensure that KMnO_4 is neutralizing all of the rotenone. Sentinel fish would also be held in the stream downstream of the detoxification station to ensure that chemical neutralization of rotenone is occurring properly. Additionally, dilution of rotenone by ground water and contributions of additional stream flows downstream of the primary detoxification station would assist in further diffusion of any residual rotenone. Detoxification would continue post treatment until ppm readings are below desired levels (<1ppm).

Additional potassium permanganate would be staged and available at an identified emergency detoxification station located downstream of the primary detoxification station to ensure adequate chemicals are available in the event of a large thunder storm or accidental rotenone spill. This emergency detoxification site would only be used in the event it is needed.

All treatment work is anticipated to take up to 5 days to complete including staging, set up, treatment, and clean-up. Drip stations and detoxification stations would be removed. The majority of dead fish would be left in the stream to provide for nutrient recycling.

Personnel and Equipment Staging.

Select projects can require from as few as 10 individuals to over 60 individuals for the 2-5 day treatment depending on stream treatment length and habitat complexity. To facilitate work, a base camp may be established to provide a camping area for personnel and storage areas for equipment. Storage of equipment including backpack sprayers, chemical drip devices, hoses, flexible tubing, generators, fuel, and rotenone may also occur on BLM lands

in the project vicinity. The BLM ID Team in the jurisdiction of where a particular project is proposed would help to identify suitable camping and staging areas to minimize potential environmental effects.

The following component does not necessarily require BLM authorization for CPW to complete, and may be initiated by the BLM and may be part of the proposed action (where beaver dams are present). Because beaver dam breaching is integral to project success and can be ground disturbing, effects are analyzed in detail in this PEA.

Beaver Dam Breaching.

Beaver dams create high quality fish habitat. However, beaver dams are not considered permanent fixtures on the landscape and routinely come and go, as streams are not static but are dynamic and always changing. Beaver dams routinely blow out and disappear and new dams are created. Beaver move in and out of streams based primarily on food availability. To effectively treat streams with the fish toxicant rotenone, it is important that water be free flowing within the stream treatment reach. Rotenone quickly binds to organic matter and breaks down rapidly into carbon dioxide and water, which makes efficient movement through the treatment reach important. Non flowing waters such as beaver ponds can reduce rotenone's effectiveness by slowing down the progression of the chemical and providing areas for organic binding. In addition, beaver ponds provide refuge areas for fishes to hide and avoid the chemical.

As part of the planning process for each specific stream treatment, beaver structures would be inventoried and assessed. Where beaver dams are present, the proposed action would call for dams to be breached to allow for pond draining, and to create free flowing stream conditions to facilitate the movement of rotenone. Breaching of beaver dams could occur by several methods including manual notching using hand tools on small dams (< 1 feet tall), the use of small explosive devices under the direction of contracted qualified detonation specialists on larger dams (> 1 feet tall), or via the use of heavy equipment, most likely a track hoe walked to the site, to mechanically dismantle dams. Breaching would entail creating a notch similar in width to the natural channel width to allow for pond draining and stream flow.

The following components require no authorization or NEPA analysis from the BLM but may be associated with the chemical treatment effort and overall goal of managing for native fishes in select waters in Colorado. It is possible that the BLM could help fund beaver removal efforts, so potential effects of this action are analyzed in this PEA. Effects of the other components below are not analyzed.

Beaver Removal.

As part of the planning process for each specific stream treatment, beaver activity and beaver structures would be inventoried and assessed. Where beaver are present, CPW's reclamation plan could call for beaver to be removed from the treatment reach. This would be conducted by qualified CPW or contract personnel and could entail any number of methods ranging from live trapping and removal to lethal means. Effective means of beaver control would be

determined by CPW as the entity tasked with managing Colorado's wildlife. Upon successful chemical treatment, beaver could be re-introduced back into treated waters or could naturally recolonize the treatment reach from adjacent untreated reaches, as determined by CPW. Where beaver are desired, the BLM would work with CPW on reintroduction opportunities to maintain and improve stream habitats.

In some cases, beaver would not need to be removed from within the treatment reach to complete chemical treatment. This could be successful in areas where low numbers of beaver and beaver dams exist or where several inactive dams are present with few or no beavers. Beaver rebuild dams rapidly, but in select cases personnel using hand tools could keep dams notched by hand between initial notching and completion of the chemical treatment. The need to remove beaver would be made on a case by case basis.

Post-treatment Assessment of Success (Fish Sampling).

This involves actions with no authorization needed by the BLM. Personnel from CPW and the BLM would sample the treatment reach extensively post treatment to look for live fish that may have been missed.

Post Treatment Restocking of Pure Cutthroat Trout.

This involves actions with no authorization needed by the BLM. However, coordination amongst CPW, the BLM, and USFWS may be warranted to determine which lineage of cutthroat trout would be most appropriate to stock into a given treatment reach. This coordination would be done prior to the initiation of any treatment.

Project Design Features.

The following design features would be standard for any project and would be implemented and included in the BLM authorization:

1. Treatments would be preceded by internal and external notifications to notify the public of treatment sites, dates, times, and potential impacts to recreating publics, and would include the following: placards, signing, and possibly press releases as deemed necessary by CPW in cooperation with the BLM
2. The treatment area would be placarded to deter public access during treatment and for at least three days following treatment
3. Application of the chemical would be conducted by licensed pesticide applicators in accordance with all applicable regulations and policies, following an approved reclamation plan (approved by Colorado Department of Public Health and Environment)
4. Transport to the site and storage of all chemicals on the site would comply with guidance in the *Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States Programmatic Environmental Impact Statement (PEIS)* (BLM 2007). Appropriate

storage sites would be identified by local BLM staff and compliance would be assured by Field Office Hazmat Coordinators

5. All equipment used during the treatment including nets, drip stations, portable pumps, hoses, tubing, etc. would be cleaned, sanitized, and weed free prior to arriving on site for work to eliminate the potential for introduction of invasive species or disease vectors
6. The use of explosives, if used to breach beaver dams, would be done by certified personnel and may require the presence of qualified wildland fire personnel equipped with appropriate protective and fire-fighting gear in the unlikely event of a spot fire adjacent to the creek
7. Standard Cultural Education/Discovery Stipulation/Condition would apply and be conveyed to project leads and all personnel prior to commencement of any work
8. To minimize impacts to gill breathing stages of amphibians, reclamation treatments would generally be conducted after August 10th. This may be waived if survey data suggests no amphibians reside within the treatment influence zone
9. Access to all treatment waters would adhere to local BLM travel management designations. The BLM could authorize CPW administrative access on closed or administrative use only routes on a case by case basis
10. The use of heavy equipment would not be utilized for beaver dam breaching if federally listed plants cannot be avoided, other less impacting methods would be utilized such as hand tools, or small explosives
11. CFT Legumine would be the required formula of rotenone for treatments in the North Fork of the Gunnison River watershed, or in any streams where USDA Organic Certified organic farms have irrigation diversions below proposed treatment areas
12. To minimize impacts associated with staging and camping of personnel during treatments, disbursed camping sites would be identified by local BLM interdisciplinary teams prior to project implementation in order to avoid culturally and biologically sensitive areas and reduce potential resource impacts associated with short-term camping
13. Whenever possible, all project implementation, staging, and camping areas will be located more than 200 meters from potential habitat for any federally listed plant species and more than 100 meters from potential habitat for any BLM sensitive plant species. If project implementation, staging, and/or camping areas are located where suitable habitat for federally listed or BLM sensitive plants is present, botany surveys would be conducted for these species including a species-appropriate protection buffer, prior to project implementation. These surveys would be conducted at the appropriate time of year, and in accordance with standard BLM survey protocols. All implementation and staging areas would be located a minimum of 200 meters from any Federally listed plant

species and 100 meters from any BLM Sensitive plant species, unless appropriate mitigations are implemented to prevent negative impacts to special status plants

14. As necessary, BLM will notify all potentially effected permittees including but not limited to livestock operators, placer miners, recreation permit holders, etc., of potential treatment activities well in advance of project implementation

NO ACTION ALTERNATIVE

Under the No Action alternative, the BLM would not consider the streamlining of chemical reclamation treatments via this PEA. Site specific environmental analysis would be conducted on a project by project basis. Effects from the no action are addressed specifically for some resources below.

ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL

REGULATION CHANGE. Eradication of nonnative fishes via liberalization of CPW regulations to encourage harvest is not possible. Even with a bag limit of up to 14 fish per day, there is simply not enough fishing pressure in most waters to remove a fraction of current nonnative fish populations. Additional expenses would not be incurred with an unlimited harvest regulation change, but prospects for success are unrealistic. This action is not a federal action and would not require BLM authorization and will not be analyzed in this document.

MECHANICAL REMOVAL. Traps and backpack electrofishing could be used to mechanically remove adult nonnative fish and some nonnative fish fry. However, due to habitat complexity, it would be impossible to remove a significant number of all year classes of nonnative fish. Electrofishing over several years would not remove all of the nonnative fish, as demonstrated by past CPW removal efforts. In addition, attempting to remove nonnative fish by mechanical means would be the most costly alternative due to extensive time and travel commitments as well as salary costs. Large-scale electrofishing removal efforts would also preclude CPW staff from attending to other high priority projects. Because electrofishing would not result in the collection of all nonnative fish from the treatment reach, the purpose and need for the project would not be met. This activity is not a federal action and would not require BLM authorization and will not be analyzed in this document.

PLAN CONFORMANCE REVIEW

The Proposed Action conforms to all BLM Colorado Resource Management Plans (RMPs), as amended. Each BLM field office RMP incorporates the current law, regulation and policy regarding the management of all resources on public lands.

The Proposed Action is subject to, has been reviewed for, and been found to be in conformance with, the following BLM Resource Management Plans (RMPs) (43 CFR 1610.5, BLM 1617.3):

Office	Name of Plan	Date Approved
<i>Northwest District</i>		
Colorado River Valley Field Office	Colorado River Valley RMP	July, 2015
Grand Junction Field Office	Grand Junction RMP	August, 2015
Kremmling Field Office	Kremmling RMP	July, 2015
Little Snake Field Office	Little Snake RMP	October, 2011
White River Field Office	White River RMP	July, 1997
<i>Southwest District</i>		
Gunnison Field Office	Gunnison RMP	February, 1993
Tres Rios Field Office	Tres Rios RMP	February, 2015
Uncompahgre Field Office	Uncompahgre Basin RMP	July, 1989
<i>Front Range District</i>		
Royal Gorge Field Office	Royal Gorge RMP	May, 1996
San Luis Valley Field Office	San Luis Valley RMP	December, 1991

STANDARDS FOR PUBLIC LAND HEALTH

In January 1997, Colorado Bureau of Land Management (BLM) approved the Standards for Public Land Health. Standards describe conditions needed to sustain public land health and relate to all uses of the public lands. Many areas would have had a full or abbreviated land health assessment completed, which should be referenced when reviewing potential cutthroat trout restoration projects.

Table 1. Standards for Public Land Health.

Standard	Definition/Statement
#1 Upland Soils	Upland soils exhibit infiltration and permeability rates that are appropriate to soil type, climate, land form, and geologic processes. Adequate soil infiltration and permeability allows for the accumulation of soil moisture necessary for optimal plant growth and vigor, and minimizes surface runoff.
#2 Riparian Systems	Riparian systems associated with both running and standing water, function properly and have the ability to recover from major surface disturbances such as fire, severe grazing, or 100-year floods. Riparian vegetation captures sediment, and provides forage, habitat and bio-diversity. Water quality is improved or maintained. Stable soils store and release water slowly.
#3 Plant and Animal Communities	Healthy, productive plant and animal communities of native and other desirable species are maintained at viable population levels commensurate with the species and habitat's potential. Plants and animals at both the community and population level are productive, resilient, diverse, vigorous, and able to reproduce and sustain natural fluctuations, and ecological processes.
#4 Threatened and Endangered Species	Special status, threatened and endangered species (federal and state), and other plants and animals officially designated by the BLM, and their habitats are maintained or enhanced by sustaining healthy, native plant and animal communities.

#5 Water Quality	The water quality of all water bodies, including ground water where applicable, located on or influenced by BLM lands will achieve or exceed the Water Quality Standards established by the State of Colorado. Water Quality Standards for surface and ground waters include the designated beneficial uses, numeric criteria, narrative criteria, and anti-degradation requirements set forth under State law as found in (5 CCR 1002-8), as required by Section 303(c) of the Clean Water Act.
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AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section provides a description of the human and natural environmental resources that could be affected by the proposed action and alternatives. In addition, the section presents comparative analyses of the direct and indirect consequences on the affected environment stemming from the implementation of the various actions.

A variety of laws, regulations, and policy directives mandate the evaluation of the effects of a proposed action and alternative(s) on certain environmental elements. Not all programs, resources or uses are affected by the proposed action and alternatives (Table 2). Only those elements that are present and potentially affected are described and brought forth for detailed analysis.

Table 2. Programs, Resources, and Uses (Including Supplemental Authorities)

Elements	¹ Not Present	² Present / No Analysis Needed	³ Present / Requires Analysis	Rationale for not Analyzed
Access and Transportation		X		It is a design feature that travel management designations would be adhered to. The BLM may authorize temporary use of closed or administrative use only roads on a case-by-case basis.
Air Quality		X		No identified impacts to air quality are anticipated from the proposed action.
Areas of Critical Environmental Concern*			X	
Cadastral Survey	X			No impacts regarding cadastral survey are anticipated from the proposed action.
Cultural Resources			X	
Native American Religious Concerns			X	
Environmental Justice			X	
Farmlands, Prime or Unique	X			No Prime or Unique Farmlands would be impacted by the proposed action.
Fire/Fuels Management	X			No impacts to fire or fuels management are anticipated from the proposed action.
Floodplains			X	
Forests	X			No impacts to forest resources are anticipated from the proposed action.

Geology and Minerals		X		It is possible that placer mining activities could be occurring in select waters identified for treatment. The Design Features would provide sufficient notification to any placer mining operators and the general public. No areas would be closed to placer mining, and no additional impacts to geology or minerals are anticipated from the proposed action
Law Enforcement	X			No law enforcement concerns are anticipated from the proposed action
Livestock Grazing Management		X		The proposed action would have no impacts to livestock or livestock grazing operations. Notifications would be made to local operators to let them know of the project and project dates.
Noise		X		Given the short duration and likely remote locations, the proposed action would have no appreciable impact on noise
Paleontology		X		No impacts to paleontological resources are anticipated from the proposed action
Plants: Invasive, Non-native Species (Noxious Weeds)			X	
Plants: Sensitive, Threatened, or Endangered			X	
Plants: Vegetation			X	
Realty Authorizations		X		No impacts to realty authorizations are anticipated from the proposed action
Recreation			X	
Social and/or Economics			X	
Soils			X	
Visual Resources			X	
Wastes, Hazardous or Solid			X	
Water Quality, Surface and Ground			X	
Water Rights		X		While water rights may be present, the proposed action would have no impacts on water rights or water rights holders.
Wetlands and Riparian Zones			X	
Wild and Scenic Rivers			X	
Wilderness Study Areas / Wilderness Characteristics			X	
Wildlife: Aquatic / Fisheries			X	
Wildlife: Migratory Birds			X	
Wildlife: Sensitive, Threatened, and Endangered Species			X	
Wildlife: Terrestrial			X	
Other: Human Health			X	

*Relevant and important values may be affected

CULTURAL RESOURCES

Affected Environment.

Proposed stream treatment areas may or may not have been surveyed prior to a planned rotenone treatment. In most cases, no cultural resources are located within the water body or expected within a given stream treatment reach. Therefore, no “historic properties” are likely to be identified as being within the area of the Proposed Action. “Historic properties” are cultural resources that are eligible or potentially eligible for inclusion on the National Register of Historic Places (NRHP).

Environmental Consequences.

Proposed Action. Absent beavers, the implementation of the Proposed Action would have little to no ground disturbing component. The primary component would be potential staging/base camping sites where personnel would camp for up to 4 nights, with light human foot traffic adjacent to and within the stream and adjacent riparian and upland habitats. Camping sites would be identified prior to project initiation by the local BLM interdisciplinary team in order to avoid areas with cultural concerns. Camping and foot traffic would result in some light trampling and compaction of vegetation over the course of the project. The rotenone treatment itself would not cause damage to cultural resources. Using existing reports or upon completion of new cultural resource surveys, sensitive areas would be avoided by project personnel.

Where beaver dams are present and would need to be breached, this could result in some ground disturbance, ranging from minimal if dams are breached by hand or small explosives, to moderate in the event heavy equipment is walked to the stream to breach dams. In the event heavy equipment is used any identified sensitive areas would be avoided. Prior to any dam breaching, the most efficient but least impactful method would be identified and used to reduce or eliminate potential effects. Cost considerations may direct the type of removal as well. It is highly unlikely beaver dams would harbor cultural resources. The proposed action would have no direct impacts to known or unknown cultural resources or historic properties.

A standard Education/Discovery condition is a design feature of any chemical treatment project and would be attached to the PUP. The importance of this condition would be stressed to CPW, including informing them of their responsibilities to protect and report any cultural resources encountered during treatment operations.

Prior to any treatments being conducted on BLM-managed lands, the Colorado State Historic Preservation Officer would be consulted with or notified as part of the Section 106 process of the National Historic Preservation Act.

No Action Alternative. Under the No Action alternative, no authorization to release chemicals on BLM-managed lands would be completed at the programmatic level. No impacts to cultural resources would be expected.

NATIVE AMERICAN RELIGIOUS CONCERNS

Affected Environment.

Several different Native American tribes have ancestral homelands throughout Colorado. It is possible that some potential sites for native cutthroat trout restoration are within or part of an area known to be culturally sensitive to Native Americans. Prior to treatment open discussion with tribes should occur to determine if proposed project areas are identified as culturally sensitive.

Environmental Consequences.

Proposed Action. Native American religious concerns are legislatively considered under several acts and Executive Orders, namely the American Indian Religious Freedom Act of 1978 (PL 95-341), the Native American Graves Environmental Assessment Protection and Repatriation Act of 1990 (PL 101-601), and Executive Order 13007 (1996; Indian Sacred Sites). These require, in concert with other provisions such as those found in the NHPA and ARPA, that the federal government carefully and proactively take into consideration traditional and religious Native American culture and life and ensure, to the degree possible, that access to sacred sites, the treatment of human remains, the possession of sacred items, the conduct of traditional religious practices, and the preservation of important cultural properties are considered and not unduly infringed upon. In some cases, these concerns are directly related to “historic properties” and “archaeological resources”. In some cases elements of the landscape without archaeological or other human material remains may be involved. Identification of these concerns is normally completed during land use planning efforts, reference to existing studies, or via direct consultation. Many project areas would have no Native American concerns known within the project area. If during consultation, it is suggested that an area is of concern, terms and conditions would be negotiated to alleviate those concerns.

The National Historic Preservation Act (NHPA) requires that if newly discovered cultural resources are identified during project implementation, work in that area must stop and the agency Authorized Officer would be notified immediately (36 CFR 800.13). The Native American Graves Protection and Repatriation Act (NAGPRA), requires that if inadvertent discovery of Native American Remains or Objects occurs, activity must cease in the area of discovery, a reasonable effort made to protect the item(s) discovered, and immediate notice made to the agency Authorized Officer, as well as the appropriate Native American group(s) (IV.C.2). Notice may be followed by a 30-day delay (NAGPRA Section 3(d)). Further actions also require compliance under the provisions of NHPA and the Archaeological Resource Protection Act.

Staff and contractors would be notified of the requirement under the NHPA, and that work must cease if cultural resources are found during project operations. A standard Education/Discovery COA for the protection of Native American values would be attached to the PUP. The importance of these COAs would be stressed to the CPW project lead and

personnel, including informing them of their responsibilities to protect and report any cultural resources encountered. The project lead would also be briefed on requirements under the NAGPRA.

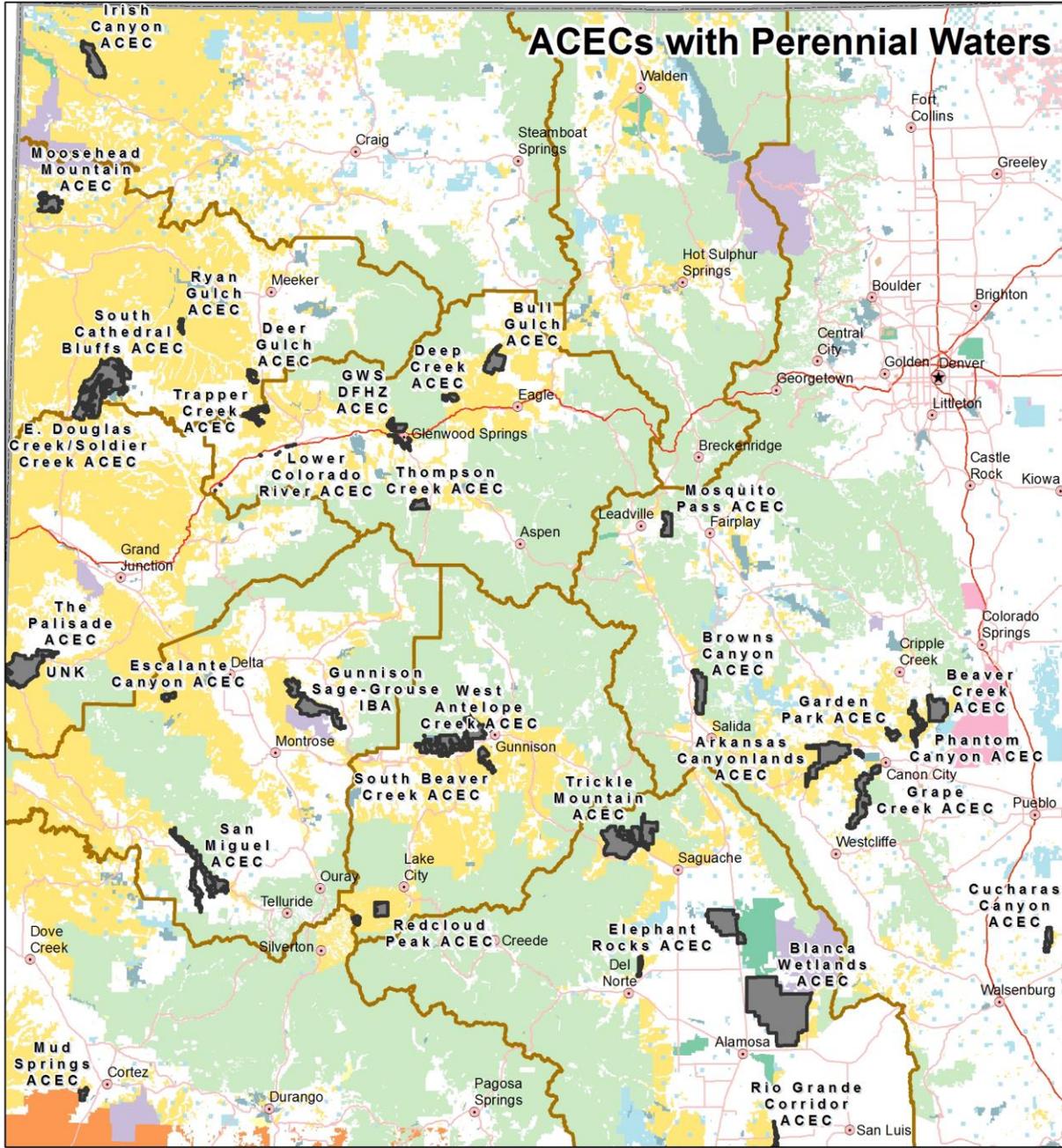
No Action Alternative. Under the No Action alternative, no authorization to release chemicals on BLM managed lands would be completed at the programmatic level. No impacts to Native American Religious Concerns would be anticipated.

AREAS OF CRITICAL ENVIRONMENTAL CONCERN (ACEC)

Affected Environment.

It is possible that proposed treatment waters could be located within identified ACECs in a given Field Office. ACECs highlight significant cultural, ecological, historical, geological, visual, or other watershed attributes of interest or concern. They contain relevant and important values that meet eligibility criteria. Currently, the BLM in Colorado manages 62 ACEC's of which 35 overlap perennial water bodies where it is possible that fish reclamations could occur.

Map 1: ACEC's



- | | | |
|-----------------------------|---------------------------|-------------------------------|
| ACECs with Perennial waters | Bureau of Land Management | Private |
| State Boundary | Bureau of Reclamation | State |
| BLM Field Office Areas | Indian Reservation | State Wildlife Areas |
| Major Highways | Military Reservation | Bankhead-Jones Land Use Lands |
| Minor Highways | National Grasslands | US Fish and Wildlife Service |
| | National Park Service | US Forest Service |
| | Other Federal | |



No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregation use with other data.

Environmental Consequences.

Proposed Action. ACECs are designations that highlight areas where special management attention is needed to protect, and prevent irreparable damage to important historical, cultural, and scenic values, fish, or wildlife resources or other natural systems or processes; or to protect human life and safety from natural hazards. These are called relevant and important values, or R&I. Most values would not be affected by the proposed action given the lack of ground disturbing activity. Where beaver dams would need to be breached, it is possible that some R&I values could be slightly impacted including existing fisheries and riparian habitats for which a particular ACEC may have been designated.

Where riparian values are an identified R&I value, impacts could include mechanical damage of select plants immediately adjacent to beaver dams. Vegetation could be damaged by small explosive charges used to breach dams resulting in individual plant death. The use of heavy equipment could result in mechanical damage to select plants as machinery moves up and down the stream breaching dams. The resulting dewatering of ponds would lower the water table and could expose bare soils. Drained pond margins could provide temporary niches for noxious weed infestation. This would likely be a short-term impact (less than one year), since spring flows would likely scour sediments and remove shallow rooted weeds. Riparian vegetation would be expected to recover quickly after dam breaching.

Where fish are an identified R&I, impacts would include mortality as rotenone kills fish at the concentrations used. Impacts would be short-term (one-two years), since the intent of the proposed action is to replace impacted nonnative fishes with desirable native or in some cases sport fish species (e.g. desirable trout species vs. white suckers). The proposed action would result in the overall enhancement of identified aquatic R&I values by either managing for native species or the enhancement of select sport fish species.

Other R&I values would not likely be impacted by the proposed action and would be avoided as needed. R&I values could be mitigated upon identification of any unanticipated effects from proposed treatment of a given water body. The visual impacts of beaver dam breaching would be unnoticeable to the casual observer and would mimic natural disturbance as beaver dams routinely come and go on the landscape. Even the breaching of several dams in a series of dams would mimic a high stream flow event.

No Action Alternative. Under the No Action alternative, no authorization to release chemicals on BLM managed lands would be completed at the programmatic level. The no action alternative could result in the overall degradation of identified aquatic R&I values by failing to manage for native species, and failure to manage for native sport fish species.

SOILS

Affected Environment.

Proposed treatment sites would be entirely within wetted stream segments and thus would be comprised of in-channel substrates: primarily cobbles, rocks, boulders, gravels, sands, and

fine sediments associated with local geologic conditions. Numerous specific soil types exist in Colorado and a variety of upland soil types may be present adjacent to a given water body. For a comprehensive list of common soil types visit the Natural Resource Conservation Service's (NRCS) soil website at <http://www.nrcs.usda.gov/wps/portal/nrcs/site/soils/home/>

Environmental Consequences.

Proposed Action. Rotenone does not persist in the environment so there would be no long-term accumulation in water, soil, plants, or animals. Rotenone breaks down naturally with exposure to light and high temperatures. Even in cold temperatures, rotenone would not persist more than a few weeks to a few months. Rotenone is mobile to moderately mobile in soil and sediment. The leaching distance of rotenone is only 2 cm in most types of soils. In sandy substrates it can penetrate up to 3 inches. Rotenone would be applied directly to the stream, so there would be little contact with soils. When released in water, rotenone generally degrades quickly through abiotic (hydrolytic and photolytic) mechanisms. The half-life in both of these environments is between 1 and 3 days. Nearly all of the toxicity of the compound is lost in 5 to 6 days of spring sunlight or 2 to 3 days of summer sunlight (Extension Toxicology Network (EXTONET), accessed February 2016). At the same time, rotenone breaks down quickly into carbon dioxide and water. It does not readily leach from soil, and would not be a groundwater pollutant. No indirect or cumulative impacts to soils would be anticipated from the proposed action.

If beaver dams are present there would be some limited potential for impacts to upland soils. When dams are breached, the pulse of water flow which results could cause in-channel fine substrates below the dam and deposited sediments in the pond above the dam to mobilize in the water column for short distances. This would increase turbidity and could result in the redistribution of stream substrates downstream. Only in the event that heavy equipment is used to breach dams could there be a potential for some minor upland soil disturbance as equipment is walked to and from the stream site. Camping and staging could result in some short-term, site specific soil and vegetation compaction from tents and human traffic. These impacts would be expected to be minimal. Human use along the stream corridor may result in light vegetation and soil compaction but this impact would be short-term and would be expected to be minimal as well.

No Action Alternative. Under the No Action alternative, no authorization to release chemicals on BLM managed lands would be completed at the programmatic level. No impacts to soils would be expected.

Analysis of Public Land Health Standard 1 for Soils.

Land Health Assessments should be conducted to determine the status for Soils within project areas. Regardless of conditions, rotenone treatment has little to no impact on soil and sediment. Implementation of the proposed action is not anticipated to degrade this land health standard from current conditions.

VISUAL RESOURCES

Affected Environment.

Locations of potential reclamation efforts are often scenic in nature, as habitats contain clear streams, dense riparian vegetation, and in some cases forested habitats. In addition, these areas are often somewhat remote and lack broad scale development and human activity. A given treatment could occur within any of a number of BLM Visual Resource Management (VRM) classifications ranging from Class I (the most scenic and sensitive to change) to Class IV the most impacted. Inventory classes are informational and provide the baseline for considering visual values in the resource management planning processes. VRM classes and visual management objectives are established for each class in resource management plans to support resource and resource use allocation decisions. The classes are indicative of existing visual values.

Environmental Consequences.

Proposed Action. Select waters considered for nonnative fish reclamation could require the breaching of all beaver dams within the treatment reach. Dams could be breached either by using hand tools, via the use of small explosive devices or the use of heavy equipment. Dam breaching would be localized in areas of the dams where there is less vegetation and the breaches would only be at a scale large enough to produce water flow of similar size to average stream width.

Surface disturbing activities associated with the Proposed Action could occur within important VRI areas including Class I or II areas. Immediate visual impacts would include debris at the time of the explosive blast, turbidity within the stream, and short pulses of increased stream flow. However, shortly after breaching, the stream would look natural to the casual observer and the results would mimic natural disturbance associated with beaver dam breaching that occurs during seasonal or periodic high stream flow events. Beaver dams are temporary structures that sit within the waterway, and they are not part of the permanent waterway (the bed and banks of the stream). They tend come and go on the landscape with relative frequency.

Over the long-term, proposed projects would be consistent with the VRM Class objective descriptions and would not change the VRM class because the beaver dam breaching would be localized and would not create any long-term surface disturbance that would: (1) attract attention of a casual observer, (2) dominate the landscape or (3) impact the predominant natural and geologic features of the drainage. The existing character of the creek would quickly mend as vegetation would begin to re-sprout and recolonize around the breached dams. In addition, beaver may fix dams upon completion of the treatment.

The rotenone treatment in the absence of beaver dams would have no impact on visual resource management.

No Action Alternative. Under the No Action alternative, no authorization to release

chemicals on BLM managed lands would be completed at the programmatic level. No impacts to Visual resources would be expected.

VEGETATION

Affected Environment.

Given the project's locations along live water bodies, the predominant vegetation type is riparian. Vegetation at and adjacent to potential reclamation waters could include several species of willow (*Salix spp.*), alder (*Alnus spp.*), birch (*Betula spp.*), narrowleaf cottonwood (*Populus angustifolia*), Fremont cottonwood (*Populus fremontii*), red-osier dogwood (*Cornus sericea*), rocky mountain maple (*Acer glabrum*), boxelder (*Acer negundo*), buffaloberry (*Shepherdia argentea*), hawthorn (*Crataegus spp.*), New Mexico privet (*Forestiera neomexicana*), aspen (*Populus tremuloides*), blue spruce (*Picea pungens*), Engelmann spruce (*Picea engelmannii*), Douglas fir (*Pseudotsuga menziesii*), sub-alpine fir (*Abies lasiocarpa*), sedges (*Carex spp.*), rushes (*Juncaceae spp.*), and several riparian grasses including tufted hairgrass (*Deschampsia cespitosa*), meadow barley (*Hordeum brachyantherum*), and reedgrasses (*Phragmites spp.*) to name a few. Common noxious weeds and invasive riparian species include Canada thistle (*Cirsium arvense*), houndstongue (*Cynoglossum officinale*), musk thistle (*Carduus nutans*), bull thistle (*Cirsium vulgare*), tamarisk (*Tamarix spp.*), Russian olive (*Elaeagnus angustifolia*), redtop (*Agrostis gigantea*), several knapweed species (*Acroptilo repens*, *Centaurea diffusa*, *Centaurea maculosa*.) and common tansy (*Tanacetum vulgare*).

Environmental Consequences.

Proposed Action. The proposed action could result in the breaching and draining of beaver ponds by the use of hand equipment, small explosive devices, or heavy equipment. Beaver pond draining via any of these methods could result in limited disconnection of riparian vegetation on pond margins to the wetted stream. It is likely that ground water and seasonal flow would remain sufficient to maintain existing riparian vegetation species. There is the potential that invasive weedy species if present in the nearby area could invade drained pond margins thereby expanding weed infestations. This would be limited and likely of short duration (less than one year) as spring flow events would likely scour weedy species from the area.

Individual riparian plants located along the stream and near the dam sites could be impacted by dam breaching. Blasting could cause mechanical damage to individual plants located immediately adjacent to the dam. If heavy equipment is used, mechanical damage could occur along all areas where heavy equipment would be walked up or down the stream to breach dams and would result in crushing of some plants. Human foot traffic along the stream margins during treatment implementation could result in trampling of vegetation. Vegetation trampling is expected to be most pronounced at the drip stations and the primary detoxification station. Damaged riparian vegetation would be expected to begin to resprout and/or recolonize within one year following completion of proposed activities. Human use

could also allow for movement of noxious weed seeds via clothing and equipment. This would likely be minimized by the design criteria requiring all personnel and equipment to be free of weed seeds prior to arrival on site. Camping/staging areas, if needed, would result in some short-term site-specific vegetation compaction and trampling. This would be a minimal impact, and sites would be identified by local BLM interdisciplinary teams at the project planning stage to minimize resource impacts.

The least impactful method of dam breaching, if needed, would be employed in order to reduce potential effects. If no beaver activity is noted within the treatment reach, very limited impact to riparian vegetation is anticipated.

No Action Alternative. Under the No Action alternative, no authorization to release chemicals on BLM managed lands would be completed at the programmatic level. No impacts to vegetation would be anticipated.

Analysis of Public Land Health Standard 3 for Healthy Plant Communities.

Land Health Assessments should be conducted to determine the status for plant communities within project areas. Regardless of conditions, rotenone treatment has little to no long term impact on plant communities. Implementation of the proposed action is not anticipated to degrade plant community health from current conditions.

INVASIVE, NON-NATIVE SPECIES

Affected Environment.

All perennial water areas have the potential for the occurrence of non-native and invasive species. Weed inventory mapping provides site specific information on select infestations. Common weeds in riparian areas of Colorado include houndstongue (*Cynoglossum officinale*), four species of thistle (*Cirsium arvense*, *Cirsium vulgare*, *Carduus natans*, *Carduus acanthoides*), Russian olive (*Elaeagnus angustifolia*), Tamarisk (*Tamarix chinensis*, *T. parviflora*), three knapweeds (*Acroptilon repens*, *Centaurea diffusa*, *Centaurea maculosa*), common tansy (*Tanacetum vulgare*) and Dalmatian toadflax (*Linaria dalmatica*).

In addition to noxious weeds, nonnative fish species including Brook Trout (*Salvelinus fontinalis*), Rainbow Trout (*Oncorhynchus mykiss*), Brown Trout (*Salmo trutta*), and White Sucker (*Catostomus commersonii*) are common throughout much of Colorado. In many places these trout species are valued as important sport fishes. In other areas, they are the targets for treatment via the proposed action. Effects to these species from proposed treatments are discussed in the Aquatic Wildlife section and won't be discussed further here.

Environmental Consequences.

Proposed Action. In areas where beaver dams would be breached and ponded water drained, this drained area would create habitat for noxious weeds and other non-native invasive species to establish. If beavers re-establish beaver dams in these areas, newly established weeds may become drowned out. However, if weeds are able to establish and set seed in these areas, they have the potential to become seed sources for further spread of weeds

downstream. Treatment of weeds in these riparian areas can be problematic, and herbicide use can be limited due to the proximity to perennial water. Personnel working along water bodies during rotenone treatment could provide a means of weed seed introduction and dispersal, particularly when passing through areas of high weed infestation. This would contribute to the cumulative impacts of weed seed dispersal by livestock and wildlife. Additionally, vehicles and equipment could introduce and spread seeds of noxious weed and other non-native invasive plant species to project areas or associated camping/staging areas. However, Design Feature #5 requires that all equipment be cleaned and inspected prior to entering the project area or any camping/staging areas, which would reduce this risk.

No Action Alternative. Under the No Action alternative, no authorization to release chemicals on BLM managed lands would be completed at the programmatic level. No impacts to invasive species would be anticipated.

THREATENED, ENDANGERED, AND SENSITIVE SPECIES - PLANT SPECIES

Affected Environment.

The Endangered Species Act (ESA), as amended (16 U.S.C. 1531-1534) mandates the protection of species listed as threatened or endangered of extinction and the habitats on which they depend. Section 7 of the ESA clarifies the responsibility of federal agencies to utilize their authorities to carry out programs for the conservation of listed species. In addition, federal agencies must consult with the U.S. Fish and Wildlife Service to ensure that any action authorized, funded or carried out by the agency is "...not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species...". In accordance with *BLM Manual 6840*, the goal of management for BLM sensitive species is to prevent a trend toward federal listing or loss of viability for these species. In addition, BLM manages significant plant communities to protect their habitat and viability. Significant plant communities are defined below.

Table 3 summarizes the 2015 species list from the U. S. Fish and Wildlife Service for Federally listed, proposed, or candidate plant species within Colorado (USFWS 2015).

Table 3. Federally listed, proposed, and candidate plant species in Colorado

ESA Listed Flowering Plants In Colorado	Status	Occupies aquatic/riparian habitat
Clay-loving wild buckwheat (<i>Eriogonum pelinophilum</i>)	Endangered	No
Colorado Butterfly plant (<i>Gaura neomexicana</i> var. <i>coloradensis</i>)	Threatened	Yes
Colorado hookless Cactus (<i>Sclerocactus glaucus</i>)	Threatened	No
Debeque phacelia (<i>Phacelia submutica</i>)	Threatened	No
Dudley Bluffs bladderpod (<i>Lesquerella congesta</i>)	Threatened	No
Dudley Bluffs twinpod (<i>Physaria obcordata</i>)	Threatened	No

ESA Listed Flowering Plants In Colorado	Status	Occupies aquatic/riparian habitat
Knowlton's cactus (<i>Pediocactus knowltonii</i>)	Endangered	No
Mancos milk-vetch (<i>Astragalus humillimus</i>)	Endangered	No
Mesa Verde cactus (<i>Sclerocactus mesae-verdae</i>)	Threatened	No
North Park phacelia (<i>Phacelia formosula</i>)	Endangered	No
Osterhout milkvetch (<i>Astragalus osterhoutii</i>)	Endangered	No
Pagosa skyrocket (<i>Ipomopsis polyantha</i>)	Endangered	No
Parachute beardtongue (<i>Penstemon debilis</i>)	Threatened	No
Penland alpine fen mustard (<i>Eutrema penlandii</i>)	Threatened	No
Penland beardtongue (<i>Penstemon penlandii</i>)	Endangered	No
Schmoll milk-vetch (<i>Astragalus schmolliae</i>)	Candidate	No
Skiff milkvetch (<i>Astragalus microcymbus</i>)	Candidate	No
Sleeping Ute milkvetch (<i>Astragalus tortipes</i>)	Candidate	No
Ute ladies'-tresses (<i>Spiranthes diluvialis</i>)	Threatened	Yes
Western prairie fringed orchid (<i>Platanthera praeclara</i>) ¹	Threatened	Yes

Of the 19 plant species protected under the Endangered Species Act that occur in Colorado, three species inhabit aquatic or riparian habitat that could be affected by the proposed action, Colorado butterfly plant, Ute ladies'-tresses. One additional species, Western prairie fringed orchid, inhabits riparian areas in the North Platte River drainage within Wyoming and Nebraska, and has the potential to be impacted by upstream projects affecting water flows within its habitat. Only these three species with potential for occurrence in habitats directly or indirectly impacted by the proposed action are analyzed further. Other species have the potential to be impacted by camping/staging area activities outside of riparian areas. Botany surveys would be required during individual project planning stages, and all camping/staging area activities would be kept outside of any occupied or suitable habitat for these species. .

Colorado Butterfly plant (*Gaura neomexicana* var. *coloradensis*)

The Colorado butterfly plant is an early successional plant (although probably not a pioneer) adapted to use stream channel sites that are periodically disturbed. It occurs on subirrigated; alluvial (stream deposited) soils on level or slightly sloping floodplains and drainage bottoms at elevations of 1,524–1,951 meters (5,000–6,400 feet). Colonies are often found in low depressions or along bends in wide, active, meandering stream channels a short distance upslope of the actual channel. The plant requires early-to mid-succession riparian (river bank) habitat. It commonly occurs in communities dominated by redbud (*Agrostis stolonifera*) and Kentucky bluegrass (*Poa pratensis*) on wetter sites, and wild licorice (*Glycyrrhiza lepidota*), Flodman's thistle (*Cirsium flodmanii*), curlycup gumweed (*Grindelia squarrosa*), and smooth scouring rush (*Equisetum laevigatum*) on drier sites. Both these habitat types are usually intermediate in moisture between wet, streamside

¹ This species does not occur in Colorado, but has the potential to be affected by projects in Colorado if they impact water flows upstream of where the plants occur

communities dominated by sedges (*Carex spp.*), rushes (*Juncus spp.*), and cattails (*Typha spp.*), and dry, upland shortgrass prairie. Typical Colorado butterfly plant habitat is open, without dense or overgrown vegetation. Coyote willow (*Salix exigua*) and Canada thistle (*Cirsium arvense*) may become dominant in habitats that are not periodically flooded or otherwise disturbed. The plant occurs on soils derived from conglomerates, sandstones, and tuffaceous mudstones and siltstones of the Tertiary White River, Arikaree, and Oglalla Formations. These soils are common in eastern Colorado and Wyoming.

Ute ladies'-tresses (*Spiranthes diluvialis*)

When Ute ladies’-tresses was listed in 1992 it was known primarily from moist meadows associated with perennial stream terraces, floodplains, and oxbows at elevations between 4300-6850 feet (1310-2090 meters). Surveys since 1992 have expanded the number of vegetation and hydrology types occupied by Ute ladies’-tresses to include seasonally flooded river terraces, subirrigated or spring-fed abandoned stream channels and valleys, and lakeshores. In addition, 26 populations have been discovered along irrigation canals, berms, levees, irrigated meadows, excavated gravel pits, roadside barrow pits, reservoirs, and other human-modified wetlands. New surveys have also expanded the elevational range of the species from 720-1830 feet (220-558 meters) in Washington to 7000 feet (2134 meters) in northern Utah. Over one-third of all known Ute ladies’-tresses populations are found on alluvial banks, point bars, floodplains, or ox-bows associated with perennial streams.

Western prairie fringed orchid (*Plantanthera praeclara*)

Western prairie fringed orchid is a perennial species which grows in tall grass prairies, occurring most often in calcareous prairie swales or sedge meadows. It requires adequate soil moisture near the ground surface, but is adversely impacted by flooding and extended inundation. It often co-occurs with Baltic rush (*Juncus balticus*), which can be an indicator of suitable habitat. Although Western prairie fringed orchid does not occur in Colorado, it does occur within the North Platte River basin, which has headwaters in northern Colorado. Because this species is vulnerable to alterations in its hydrology, it has the potential to be impacted by upstream activities if they impact this hydrology

Table 4 summarizes the June 2015 BLM Colorado State Director's Sensitive Species List for plants (BLM 2015) that may likely occur within the project area or be impacted by the Proposed Action.

Table 4. BLM Colorado State Director’s Sensitive Species List - Plants

BLM Sensitive Plants	Occupies aquatic/riparian habitat	Occurrence BLM Field Offices/Districts		
		Northwest	Southwest	Front Range
Narrow-stem gilia (<i>Aliciella stenothyrsa</i>)	No	GJ, WR		
Jones' bluestar (<i>Amsonia jonesii</i>)	No	GJ	TR	
Rydberg's golden columbine (<i>Aquilegia chrysantha var. rydbergii</i>)	Yes			RG
Crandall's rockcress (<i>Boechera</i>)	No		GN, UN	RG

BLM Sensitive Plants	Occupies aquatic/riparian habitat	Occurrence BLM Field Offices/Districts		
		Northwest	Southwest	Front Range
<i>crandallii</i>)				
Dwarf milkweed (<i>Asclepias uncialis</i>)	No			RG
Gunnison milkvetch (<i>Astragalus anisus</i>)	No		GN	
DeBeque milkvetch (<i>Astragalus debequaeus</i>)	No	GJ, CRV		
Horseshoe milkvetch (<i>Astragalus equisolensis</i>)	No	GJ		
Debris milkvetch (<i>Astragalus detritalis</i>)	No	LS, WR		
Duchesne milkvetch (<i>Astragalus duchesnensis</i>)	No	LS, WR		
Grand Junction milkvetch (<i>Astragalus linifolius</i>)	No	GJ	UN	
Ferron's milkvetch (<i>Astragalus musiniensis</i>)	No	GJ		
Naturita milkvetch (<i>Astragalus naturitensis</i>)	No	GJ, CRV	TR, UN	
Fisher milkvetch (<i>Astragalus piscator</i>)	No	GJ		
San Rafael milkvetch (<i>Astragalus rafaensis</i>)	No	GJ	UN	
Ripley's milkvetch (<i>Astragalus ripleyi</i>)	No			SLV
Sandstone milkvetch (<i>Astragalus sesquiflorus</i>)	No		UN	
Sleeping Ute milkvetch (<i>Astragalus tortipes</i>)	No		TR	
Grand Junction suncup (<i>Camissonia eastwoodiae</i>)	No	GJ		
Slender spiderflower (<i>Cleome multicaulis</i>)	Yes			SLV
Crescent bugseed (<i>Corispermum navicula</i>)	No	K		
Tufted cryptantha (<i>Cryptantha caespitosa</i>)	No	LS, WR		
Gypsum Valley cateye (<i>Cryptantha gypsophila</i>)	No	GJ	TR, UN	
Osterhout's cryptantha (<i>Cryptantha osterhoutii</i>)	No	GJ	GN	
Rollins' cryptantha (<i>Cryptantha rollinsii</i>)	No	WR		
Fragile rockbrake (<i>Cryptogramma stelleri</i>)	No	K	GN, TR, UN	SLV
Uinta Basin springparsley (<i>Cymopterus duchesnensis</i>)	No	LS		
Kachina fleabane (<i>Erigeron kachinensis</i>)	No	GJ	TR	
Singlestem buckwheat (<i>Eriogonum</i>	No	LS		

BLM Sensitive Plants	Occupies aquatic/riparian habitat	Occurrence BLM Field Offices/Districts		
		Northwest	Southwest	Front Range
<i>acaule</i>)				
Brandegee's buckwheat (<i>Eriogonum brandegeei</i>)	No			RG
Comb Wash buckwheat (<i>Eriogonum clavellatum</i>)	No		TR	
Colorado buckwheat (<i>Eriogonum coloradense</i>)	No		GN	RG
Grand buckwheat (<i>Eriogonum contortum</i>)	No	GJ		
Ephedra buckwheat (<i>Eriogonum ephedroides</i>)	No	LS, WR		
Woodside buckwheat (<i>Eriogonum tumulosum</i>)	No	LS		
Clay hill buckwheat (<i>Eriogonum viridulum</i>)	No	LS		
Tufted fraseria (<i>Frasera paniculata</i>)	No	GJ		
Cathedral Bluff dwarf gentian (<i>Gentianella tortuosa</i>)	No	WR		
Lone Mesa snakeweed (<i>Gutierrezia elegans</i>)	No		TR	
Pagosa skyrocket (<i>Ipomopsis polyantha</i>)	No		TR	
Piceance bladderpod (<i>Lesquerella parviflora</i>)	No	GJ, WR		
Pagosa Springs bladderpod (<i>Lesquerella pruinosa</i>)	No		TR	
Uncompahgre bladderpod (<i>Lesquerella vicina</i>)	No		UN	
Adobe desertparsley (<i>Lomatium concinnum</i>)	No		UN	
Canyonlands biscuitroot (<i>Lomatium latilobum</i>)	No	GJ		
Paradox lupine (<i>Lupinus crassus</i>)	No		UN	
Dolores River skeletonplant (<i>Lygodesmia doloresensis</i>)	No	GJ	TR	
Gold blazingstar (<i>Mentzelia chrysantha</i>)	No			RG
Royal Gorge blazingstar (<i>Nuttallia densa</i>)	No			RG
Roan cliffs blazingstar (<i>Mentzelia rhizomata</i>)	No	GJ, CRV		
Bessey locoweed (<i>Oxytropis besseyi</i> var. <i>obnapiformis</i>)	No	WR		
Rock-loving neoparrya (<i>Neoparrya lithophila</i>)	No			SLV, S
Few-flower ragwort (<i>Packera pauciflora</i>)	Yes			RG
Colorado feverfew (<i>Parthenium ligulatum</i>)	No	LS, WR		
Aromatic Indian breadroot	No	GJ	TR, UN	

BLM Sensitive Plants	Occupies aquatic/riparian habitat	Occurrence BLM Field Offices/Districts		
		Northwest	Southwest	Front Range
<i>(Pediomelum aromaticum)</i>				
Degener's beardtongue (<i>Penstemon degeneri</i>)	No			RG
Gibbens' beardtongue (<i>Penstemon gibbensii</i>)	No	LS		
Graham's beardtongue (<i>Penstemon grahamii</i>)	No	WR		
Harrington's beardtongue (<i>Penstemon harringtonii</i>)	No	CRV, K		
White River beardtongue (<i>Penstemon scariosus</i> var. <i>albifluvis</i>)	No	WR		
Yampa beardtongue (<i>Penstemon acualis</i> var. <i>yampaensis</i>)	No	LS		
Cushion bladderpod (<i>Physaria pulvinata</i>)	No		TR	
Pale blue-eyed grass (<i>Sisyrinchium pallidum</i>)	Yes	K		RG, SLV
Rock tansy (<i>Sphaeromeria capitata</i>)	No	LS		
Cathedral Bluff meadow-rue (<i>Thalictrum heliophilum</i>)	No	GJ, CRV, WR		
Hairy Townsend daisy (<i>Townsendia strigosa</i>)	No	GJ, LS		
Rolland's bulrush (<i>Trichophorum pumilum</i>)	Yes		GN	RG

OCCURRENCE:

Indicates Field Office of known occurrence using the following codes:

Northwest= LS Little Snake, WR White River, KR Kremmling, GJ Grand Junction, CRV Colorado River Valley

Southwest= UN Uncompahgre, GN Gunnison, TR Tres Rios

Front Range = RG Royal Gorge, SLV San Luis Valley, S Saguache

Of the 67 plant species listed on the BLM Colorado State Director's list, two species, Rydberg's golden columbine and pale blue-eyed grass, inhabit aquatic or riparian habitat that could be affected by the proposed action. These species are discussed below. Three other species, slender spiderflower, few-flower ragwort, and Rolland's bulrush, occupy wetlands or fen habitat not known to be associated with fish-bearing stream systems. Therefore, it is unlikely that the proposed action would affect these species or their associated habitat .

Rydberg's golden columbine (*Aquilegia chrysantha* var. *rydbergii*)

Rydberg's golden columbine occurs in canyons and foothills along streams or in rocky ravines growing in organic soils. It has also been observed in gravel derived from granite parent material. Often the species is found near the base of boulders along canyon sides and floor; it may also grow on seep-fed rocky ledges. It grows in shady and moist areas on slopes above creeks, alongside drainages, and within riparian areas of perennial streams. Associated plant species include hazelnut, narrow leaf cottonwood, river birch, chokecherry, Rocky Mountain maple, aspen, and willow. Rydberg's golden columbine is endemic to Colorado,

known to occur in Fremont, El Paso, Jefferson, and Las Animas counties. There are no known occurrences of this species on lands managed by the BLM in Colorado.

Pale blue-eyed grass (*Sisyrinchium pallidum*)

Pale blue-eyed grass occupies the margins of flowing streams, and in wet meadows and fens between 6,500 and 7,900 feet in elevation. It can also occur along roadside ditches and in irrigated hay meadows where standing water is available early in the growing season. It is often grows in slightly alkaline soil.

Environmental Consequences.

Proposed Action. Any Federally listed or BLM Sensitive plant species located at stream treatment sites, or at associated camping/staging areas, has the potential to be directly impacted by trampling or crushing from foot or vehicle traffic, or crushing from equipment placed on top of plants. The degree of potential impact would depend on the number of people involved in the project, the duration of the project, and the time of year relative to individual species phenology. It is unlikely that trampling of riparian vegetation at treatment sites would result in extirpation of a population, and in the case of rhizomatous species, re-sprouting from rhizomes would likely occur after trampling.

Removal of beaver dams could impact special status plants to differing degrees depending on the method used. Notching dams by hand would have no impact on special status plants, other than potential trampling by crews along stream banks. Removing dams with explosives could result in ejected dam debris impacting aboveground portions of plants, potentially damaging stems, leaves, and reproductive structures. These impacts would likely be temporary, resulting in reduced growth and seed production during the project year, and potentially reduced energy stores in plant roots going into winter. Use of heavy equipment to remove beaver dams could have severe short-term impacts to plants growing on the banks, causing crushing, soil compaction, and potential plant mortality. A design feature has been incorporated into the proposed action requiring that if federally listed or BLM sensitive plants cannot be avoided with heavy equipment utilized to breach dams, that lower impact methods be utilized.

Beaver dam breaching would likely alter hydrology and soil moisture levels on adjacent stream banks, which would alter habitat conditions for riparian special status species. For species which are highly dependent on specific hydrologic conditions, this could make the habitat unsuitable. If beavers rebuild the dam, habitat suitability could be restored, but if the stream were to remain undammed long enough, plant occurrences could be lost.

To prevent these direct impacts, a design feature has been incorporated into the proposed action requiring that where needed botany surveys would be conducted at the project planning stage, and at the appropriate time of year, for all federally listed and BLM Sensitive plant species potentially occurring in or near the project area. Based on survey results, placement of drip stations and detoxification stations would be located to avoid direct impacts to special status plant occurrences, and these occurrences, along with a protection

buffer, would be identified on the ground to prevent trampling by crews. Similarly, any camping/staging areas would be surveyed for special status plants, and if any are found, these activity areas would be located away from any federally listed plant occurrences or BLM sensitive plant occurrences. If any potential effects are identified for any upland federally listed plant species in proximity to camping/staging areas, a Biological Assessment would be completed and Section 7 consultation with the U.S. Fish & Wildlife Service (FWS) would ensue.

Special status plant species could also experience indirect impacts from stream restoration project implementation. These impacts could include increased vulnerability to noxious weeds and other invasive species associated with beaver dam removal, disturbance at camping/staging areas, as well as increased risk of weed seed introduction and spread by vehicles and crew members. These weed risks are described in the Invasive-Non-Native Species section above. Noxious weeds establishing in riparian areas often form monocultures which are difficult to eliminate. Herbicides required to control these infestations would like extirpate any special status species occurrences that might be present within or adjacent to them. Special status plants could also be vulnerable to herbicide drift even at relatively long distances from application, depending on the method of application.

Beaver dam breaching would likely alter hydrology and soil moisture levels on adjacent stream banks, at least temporarily, which would alter habitat conditions for riparian species. For species which are highly dependent on specific hydrologic conditions, this could make the habitat unsuitable. If beavers rebuild the dam, habitat suitability could be restored, but if the stream were to remain undammed long enough, special status plant occurrences could be lost.

Upland special status species could also experience direct and indirect impacts associated with camping/staging areas. Trampling, increased noxious weed and invasive species risk, and herbicide drift from treating noxious weeds are all possible for these upland species. In addition, they may be impacted by increased dust deposition from increased traffic associated with vehicles and equipment accessing the work site.

The above potential impacts are applicable to special status plant species in general. Specific concerns for individual species are described below.

Federally listed plants

The Colorado Butterfly plant is primarily a prairie dwelling species occurring east of the Colorado and Wyoming foothills. The BLM in Colorado has very limited surface management in the region of Colorado where this species occurs. While it is possible that a stream restoration project could occur in proximity to this species, the probability is low.

Ute ladies'-tresses does occur, or has the potential to occur, in proximity to many BLM Colorado managed streams that could be identified for reclamation projects. There are many known occurrences along the Front Range, and in the Green/Yampa River and Roaring Fork River drainages in western Colorado. Previously unsurveyed potential habitat for this species is also present along many streams. Therefore, Ute ladies'-tresses could potentially

be present along streams identified for rotenone treatment.

If either Colorado butterfly plant or Ute ladies'-tresses were to be found in pre-project surveys, these habitats would either be avoided or in the event they can't be and a "No Effect" determination can't be made at the site specific project level, then a Biological Assessment would be completed, and Section 7 consultation with the FWS would ensue.

Western prairie fringed orchid does not occur in Colorado, so there would be no potential direct effects on this species from stream reclamation projects. The only potential indirect impact of concern for this species is alteration of hydrology within the North Platte River drainage. While beaver dam removal could be expected to have localized impacts to hydrologic conditions in adjacent plant habitat, it is unlikely to impact hydrologic conditions in remote downstream sites within neighboring states where Western prairie fringed orchid grows. Therefore, this species is unlikely to experience any effects from stream restoration projects in Colorado

BLM Sensitive Plants

Rydberg's golden columbine grows within riparian areas of perennial streams, but is not restricted to this habitat. Its primary threats and management issues include recreational impacts, habitat encroachment by invasive species, and livestock grazing. It has the potential to be present within stream restoration project areas, and could be impacted, at least in the short term, by project implementation. Potential introduction or expansion of noxious weeds or other invasive species would be a particular concern for this species.

Pale blue-eyed grass can be found in a variety of at least seasonally wet habitats, including stream banks. Hydrology is particularly important for this species, and habitat drying associated with breached beaver dams would be a particular concern. Noxious weeds and other invasive species are also of concern, and could be introduced during project implementation, or increase following beaver dam breaching

No Action Alternative. Under the No Action alternative, no authorization to release chemicals on BLM managed lands would be completed at the programmatic level. No impacts to special status plant species would be anticipated.

Analysis of Public Land Health Standard 4 for Threatened, Endangered, and other Special Status Plants.

Land Health Assessments should be conducted to determine the status for threatened, endangered, and other special status plants within project areas. Regardless of conditions, rotenone treatment has little to no long term impact on plant communities. Implementation of the proposed action is not anticipated to degrade plant community health from current conditions.

THREATENED, ENDANGERED, AND SENSITIVE SPECIES - AQUATIC WILDLIFE

Affected Environment.

Table 5 summarizes the current U. S. Fish and Wildlife Service list of federally listed, proposed, or candidate aquatic wildlife species in Colorado (USFWS 2015).

Table 5. Federally listed, proposed, and candidate aquatic species in Colorado

Species	Habitat/Range
Colorado River Cutthroat Trout – Green Lineage (<i>Oncorhynchus clarkii spp.</i>)	Currently considered Federally threatened per USFWS direction. This lineage is native to the Colorado, Dolores, and Gunnison river basins in western Colorado. Historically found in several cold, clear, gravelly streams and mountain lakes. Now limited to smaller discrete headwater streams within and in a few select cases outside of its historic range (historic trans-basin stocking).
Greenback Cutthroat Trout (<i>Oncorhynchus clarkii stomias</i>)	Federally listed as threatened. This cutthroat trout is native to the South Platte River drainage. Historically found in several cold, clear gravelly streams and mountain lakes. Now limited to Bear Creek in the Arkansas River drainage. Bear Creek fish are being propagated in federal and state fish hatcheries and reclamation actions to remove nonnative trout and stock and reestablish genetically pure populations are currently under way.
Bonytail (<i>Gila elegans</i>)	Federally listed as endangered. This large chub is a member of the minnow family found in large, fast-flowing waterways of the Colorado River system. Their current distribution and habitat status are largely unknown due to its rapid decline prior to research into its natural history. The bonytail is extremely rare in Colorado and no self-sustaining population exists. Extensive stocking has occurred in portions of the Colorado River and Gunnison River in recent years. Designated Critical Habitat is located near the CO/UT border on the Colorado River at Black Rocks
Colorado pikeminnow (<i>Ptychocheilus lucius</i>)	Federally listed as endangered. Primarily exists in the Green River below the confluence with the Yampa River, the lower Duchesne River in Utah, the Yampa River below Craig, Colo., the White River from Taylor Draw Dam near Rangely downstream to the confluence with the Green River, the Gunnison River in Colorado, the San Juan River basin in Colorado, New Mexico, and Utah, the Colorado River from Palisade, Colorado, downstream to Lake Powell.
Humpback chub (<i>Gila cypha</i>)	Federally listed as endangered. Found in deep, clear to turbid waters of the Colorado River basin. The nearest known population of humpback chub is in the Colorado River at Black Rocks west of Grand Junction at the Colorado-Utah border.
Razorback sucker (<i>Xyrauchen texanus</i>)	Federally listed as endangered. The razorback sucker was once widespread throughout most of the Colorado River Basin from Wyoming to Mexico. In the upper Colorado River Basin, they are now found in the upper Green River in Utah, the lower Yampa River in Colorado, the White River in Colorado and Utah, the lower portions of the Gunnison River, and occasionally in the Colorado River near Grand Junction. Biologists in Utah and Colorado have been stocking them in the Colorado and Green rivers.

Table 6 summarizes the Colorado BLM State Director's current Sensitive Species List for aquatic species (BLM, 2015)

Table 6. Colorado BLM State Director’s Sensitive Species List – Aquatic Species

Species	Habitat/Range
Fish	
Bluehead Sucker (<i>Catostomus discobolus</i>), Flannelmouth Sucker (<i>Catostomus latipinnis</i>), and Roundtail Chub (<i>Gila robusta</i>) Collectively called "The 3 Species"	Primarily found in larger rivers but may also be found in smaller tributaries with good connectivity to larger river systems. These fish are endemic to the Colorado River basin and reside within the mainstem Colorado River and its major tributary streams. Given their biology, feeding habits, habitat needs, and niche in the ecosystem, these species can persist in the face of actions that increase sediments to streams and rivers containing these species.
Mountain Sucker (<i>Catostomus platyrhynchus</i>)	The mountain sucker is found primarily in small, low- mid elevation streams in northwestern Colorado with gravel, sand or mud bottoms. They inhabit undercut banks, eddies, small pools, and areas of moderate current. Young fish prefer backwaters and eddies. A population of mature adults is found in Steamboat Lake.
Colorado River Cutthroat Trout - Blue Lineage (<i>Oncorhynchus clarkii pleuriticus</i>)	This is one of four subspecies/lineages of native trout still residing in Colorado. This lineage is native to the White and Yampa river drainages in northwest, Colorado. This species prefers clear, cool headwaters streams with gravelly substrates, well-distributed pools, stable streambanks, and abundant stream cover. This lineage is abundant both within its native range and throughout the state due to extensive historic stocking efforts.
Rio Grande Sucker (<i>Catostomus plebeius</i>)	Generally found within the Rio Grande River basin within the San Luis Valley and the Rio Grande Basin in Hot Creek and McIntyre Springs. Prefers rapidly flowing water, but also uses backwater habitats. Spawns in the spring generally February to April.
Arkansas Darter (<i>Etheostoma cragini</i>)	This small fish is native to the Arkansas River basin in small plains streams. Spawns in the spring and early summer in shallow gravel substrates.
Rio Grande Chub (<i>Gila Pandora</i>)	Native to the Rio Grande River basin. Prefers pools of small to moderate sized steams near areas of current with undercut banks, overhanging stream vegetation, and aquatic plants. May occur in some small impoundments. They spawn in the spring in riffle habitats.
Rio Grande Cutthroat Trout (<i>Oncorhynchus clarkii virginalis</i>)	This is one of four subspecies/lineages of native trout still residing in Colorado. This lineage is native to the Rio Grande drainages in south-central, Colorado. This species prefers clear, cool headwaters streams with gravelly substrates, well-distributed pools, stable streambanks, and abundant stream cover. This lineage is abundant and stable within its native range.
Amphibians	
Northern leopard frog (<i>Rana pipiens</i>)	Generally found between 3,500 to 11,000 feet, in wet meadows and in shallow lentic habitats. They require year-round water sources, deep enough to provide ice free refugia in the winter.
Great Basin spadefoot toad (<i>Spea intermontana</i>).	This toad is known to occupy a wide variety of habitat including lowlands, foothills, and short grass plain. This species generally inhabits and breeds in seasonal pools and ponds in pinyon-juniper woodland, sagebrush, and semi-desert shrubland habitats, mostly below 6,000 feet in elevation.
Canyon treefrog (<i>Hyla arenicolor</i>)	Generally found along intermittent streams in deep, rocky canyons between 4,500 and 6,300 feet elevation. They require water in which to breed in the spring and early summer associated with the onset of summer monsoons.

Boreal toad (<i>Anaxyrus boreas boreas</i>)	Generally found between 7,500 and 12,00 feet elevation in alpine meadows and sub-alpine forest areas in shallow off channel ponds, lakes, marshes, and bogs with sunny exposure. Breed in still waters from May to late July and larvae take two months to develop.
Plain's leopard frog (<i>Rana blairi</i>)	Generally found below 6,000 feet elevation along the margins of streams, ponds, reservoirs, creek pools, irrigation ditches, and other water bodies in plains grassland, sandhills, stream valleys, or canyon bottoms. Breed from mid-April to early June.
Northern cricket frog (<i>Acris crepitans</i>)	In Colorado, only known from the Republican River in Yuma County below 4,000 feet elevation, and possibly the South Platte drainage in Weld and Morgan counties. Prefers gently sloping edges of permanent or semipermanent ponds, reservoirs, and streams. They breed from April – August after rainfall.

Environmental Consequences.

Federally Threatened, Endangered, Candidate, and Proposed Species

Proposed Action.

Colorado River Endangered Fishes (Bonytail, Colorado Pikeminnow, Humpback Chub, Razorback Sucker)

These fish reside primarily in larger mainstem rivers. Proposed chemical treatments are most likely to be proposed in small headwater streams far from occupied and designated critical habitat for these endangered fish. Given the strict adherence to protocols and distance to occupied habitat, it is highly unlikely that these fish would be negatively affected by the proposed action. At this programmatic level the proposed action would be expected to have “No Effect” on these fish or their habitats.

In the event that a stream would be identified for treatment within the influence zone of occupied habitat for any of these fish, a determination of effects would be completed and if impacts are identified at the site specific project level, Section 7 consultation with the U. S. Fish & Wildlife Service (FWS) would be initiated.

Colorado River Cutthroat Trout – Green Lineage

This is one of the four subspecies/lineages of cutthroat trout that is targeted for range expansion via the proposed action. Approximately 66 populations are currently known across the state of Colorado. The majority of these are on the west slope within their native basins of origin. A few are located outside of their native basin due to historic fish stocking practices.

It is possible that in select cases where this species co-exists in a stream with nonnative trout (brook trout, brown trout, rainbow trout) and one of these streams is targeted for removal of the nonnative fish component, the proposed action could result in incidental impact to select individuals. Measures to eliminate or substantially reduce impacts would likely be implemented including electrofishing removal of individuals prior to chemical treatment. In the event a chemical reclamation in this scenario is considered, the likelihood for impact would be assessed at the site specific level and Section 7 Consultation with FWS would be initiated. This consultation would address any incidental take/mortality of individuals from the project

recognizing the overall project goal of removing nonnative fish and expanding or maintaining the larger green lineage population.

Greenback Cutthroat Trout

This is one of the four subspecies/lineages of cutthroat trout that is targeted for range expansion via the proposed action. Due to this species' scarcity on the landscape, there would be no negative impacts to this species expected from the proposed action. Conversely, proposed chemical treatments would benefit this species as select streams are identified, treated, and then stocked with genetically pure fish currently residing in state and federal hatcheries.

No Action Alternative. Under the No Action alternative, no authorization to release chemicals on BLM managed lands would be completed at the programmatic level. If chosen, the No Action alternative would not help to facilitate the management of federally listed fishes in BLM managed waters in the state of Colorado. Non-native fishes would continue to persist and dominate select waters and new or reclaimed streams harboring federally listed species would not increase in number or stream mile length. BLM and CPW would not be implementing important components of the select species conservation agreements or recovery plans that both agencies are signatory to, and it is possible that the lack of pro-active management for listed fishes could result in reduced recovery potential and/or need to upgrade listings from threatened to endangered for select species.

BLM Sensitive Fish Species

Proposed Action.

Colorado River Cutthroat Trout – Blue Lineage

This is one of the four subspecies/lineages of cutthroat trout that is targeted for range expansion via the proposed action. The majority of these populations are on the west slope within their native basins of origin. However, due to extensive historic stocking, several populations exist in all of the major river basins in the state.

It is possible that in select cases where this species co-exists in a stream with nonnative trout (brook trout, brown trout, rainbow trout) and one of these streams is targeted for removal of the nonnative fish component, the proposed action could result in incidental impact to select individuals. Measures and design features to eliminate or substantially reduce impacts would likely be implemented, including electrofishing removal of individuals prior to chemical treatment. In the event a chemical reclamation in this scenario is considered, the likelihood for impact would be assessed at the site specific level. The larger population would benefit from the proposed action even if select individuals would be impacted.

Rio Grande Cutthroat Trout

This is one of the four subspecies/lineages of cutthroat trout that is targeted for range expansion via the proposed action. The vast majority of these cutthroat populations are found within their native basin of origin, the Rio Grande River basin.

It is possible that in select cases where this species co-exists in a stream with nonnative trout (brook trout, brown trout, rainbow trout) and one of these streams is targeted for removal of the nonnative fish component, the proposed action could result in incidental impact to select individuals. Measures and design features that could eliminate or substantially reduce impacts would likely be implemented including electrofishing removal of individuals prior to chemical treatment. In the event a chemical reclamation in this scenario is considered, the likelihood for impact would be assessed at the site specific level. The larger population would benefit from the proposed action even if select individuals could be impacted.

All remaining BLM Sensitive Fish Species

The vast majority of fish reclamation efforts involve Coldwater trout species in small discrete streams near river and stream headwaters. The remaining BLM sensitive species are primarily warm/cool water species that generally reside downstream in lower elevation reaches of streams and rivers away from areas where most treatments are anticipated to occur. However, there are select cases where warm and/or cool water nonnative and invasive species could be the target of removal efforts. Where these species habitats overlap there could be some potential for effects to these fish, including direct mortality from the chemical rotenone. Rotenone is not species specific and is effective on all fish species, although species tolerance ranges do vary. CPW manages the State's fish species and populations and it is within their purview to prioritize and emphasize management of select species over others. In general, CPW emphasizes the management of native fish species and they may choose to have small effects to individual native fishes for the betterment of the larger native fish populations. In most all cases removal efforts target nonnative species and treatments would be for the long-term benefit of these native species. In the event of some limited direct mortality, it is likely that the larger populations would respond positively post treatment, given the removal of target predatory and competitive species. The larger populations of these species would provide a source for repatriation of small impacted stream reaches. CPW could choose to minimize impacts to non-target native fishes by electrofishing and removing prior to treatment. Post treatment stocking of native fish would also help to maintain and reestablish native fishes in impacted reaches.

No Action Alternative. Under the No Action alternative, no authorization to release chemicals on BLM managed lands would be completed at the programmatic level. If chosen, the No Action alternative would not help to facilitate the management of sensitive fish species located in BLM managed waters in the state of Colorado. Non-native fishes would continue to persist and dominate select waters and new or reclaimed streams harboring native species would not increase in number or stream mile length. BLM and CPW would not be implementing important components of the range-wide conservation agreements and strategies that both agencies are signatory to, and it is possible that the lack of pro-active management for sensitive fishes could result in the future need to list select species or subspecies as threatened or endangered under the Endangered Species Act.

BLM Sensitive Amphibian Species

Proposed Action. Impacts from the use of rotenone are possible on BLM sensitive amphibians, particularly at the sub-adult life stage when tadpoles are in a gill breathing life stage. Rotenone

is generally less toxic to amphibians than fish. Rotenone may be absorbed into both skin and respiratory membranes, but skin may present more of a barrier because it creates a greater distance for the chemical to diffuse across (Fontenot et al. 1994), and a smaller surface area relative to gill structures. Studies suggest that tadpoles and other larval forms of amphibians that utilize gills for respiration are just as sensitive to rotenone as fishes, while adult forms, which no longer utilize gills, are much less susceptible to rotenone. Larval amphibians appear to have resistance roughly equivalent to those of the most tolerant fish species. Field investigations revealed that, in the 24 hours following application, rotenone was lethal to gill-breathing amphibian tadpoles and non-lethal to non-gill breathing metamorphs, juveniles, and adults (Billman, 2010).

Potential direct impacts to amphibians include absorption of rotenone during project implementation. Amphibians in their terrestrial life stage should not be affected by the rotenone treatment; however, those in gill-breathing life stages, if present, would be susceptible. While at least some mortality of aquatic stages of amphibians is possible from CPW's rotenone application, studies have shown that population level effects do not occur to amphibian species during rotenone treatments. In the year(s) following rotenone treatment, tadpole repopulation occurred at all water bodies treated with rotenone product (Billman 2010, McCoid and Bettoli, 1996).

Potential indirect impacts on amphibians include loss of prey species from the rotenone treatment. For example, reductions in emerging aquatic insects could occur, particularly if multiple treatments are required; however, aquatic insect abundance is expected to recover quickly through drift from untreated upstream areas, by immigration of adults from non-impacted downstream reaches, or from life stages of existing bugs not in a gill breathing life stage. In many cases, current populations of non-native fish are having adverse effects on amphibian populations through predation, competition for prey resources, and alteration of native and natural food webs. Removal of non-native fishes may benefit resident amphibians over the long-term. Several studies have shown the removal of non-native trout can result in an increase in abundance and diversity of amphibian populations (Hoffman et al. 2004, Vrendenberg 2004, Knapp et al. 2007, and Pope 2008).

Most amphibians, such as toads, present during a late summer/early autumn treatment would have completed their metamorphosis to the adult stage. Thus they would be past the gill breathing life stage and have limited potential to be impacted. As a design feature to minimize impacts to gill breathing life stages of amphibians, proposed treatments would be implemented in late summer early fall. The timing of metamorphosis from juvenile into adults varies by species and can vary within species based on location and other factors. Implementing as late in the summer and fall as possible would reduce the potential to impact individual amphibians. Design Feature 8 calls for conducting treatments after August 10th, unless survey data shows an absence of amphibians within the treatment influence zone. This would help to reduce impacts to gill breathing stages of amphibians, since by this date the majority of amphibians would have morphed into adults. The earlier treatments would be conducted the more likely a chance of mortality to individual amphibians. Population level effects are not anticipated.

No Action Alternative. Under the No Action alternative, no authorization to release chemicals on BLM managed lands would be completed at the programmatic level. . In many cases,

current populations of non-native fish are having adverse effects on amphibian populations through predation, competition for prey resources, and alteration of native and natural food webs. Under the No Action alternative, these adverse impacts on amphibian populations would likely continue and could worsen.

Analysis of Public Land Health Standard 4 for Threatened, Endangered, and other Special Status Aquatic Wildlife.

Land Health Assessments for the specific treatment area should be conducted or past assessments consulted to determine the status for threatened, endangered, and other special status aquatic wildlife within project areas. Rotenone treatment has the potential to kill select individual BLM sensitive fishes and amphibians as well as co-mingled cutthroat trout. However, without rotenone treatment, native fish species would eventually be outcompeted and displaced by non-native species. Further, to minimize the impact of rotenone on amphibians, treatments could be conducted after species have matured and no longer have gills. In the long-term the proposed action should improve special status aquatic species at the population level. This would help with the meeting of this land health standard in BLM Field Offices across Colorado.

THREATENED, ENDANGERED, AND SENSITIVE SPECIES - TERRESTRIAL WILDLIFE

Affected Environment.

Table 7 summarizes the latest species list (USFWS 2015) from the U. S. Fish and Wildlife Service for federally listed, proposed, or candidate terrestrial wildlife.

Table 7. Federally listed, proposed, and candidate terrestrial wildlife species

Species	Information/Range/Habitat Description
Black-footed Ferret (<i>Mustela nigripes</i>)	Federally listed as endangered. Black-footed ferrets have ranged statewide but never have been abundant in Colorado. Their habitat included the eastern plains, the mountain parks and the western valleys – grasslands or shrub lands that supported some species of prairie dog, the ferret’s primary prey. State and federal biologists have attempted to establish two major black-footed ferret colonies: one at Coyote Basin (Colorado-Utah border west of Rangely, CO) and another at the BLM’s Wolf Creek Management Area southeast of Dinosaur National Monument. No black-footed ferret populations have been established in NW Colorado. Ferrets were released in the management areas, however, due to plague in the prairie dog colonies, no ferrets are believed to inhabit the Wolf Creek management area. It is believed that there are ferrets in the Utah side of Coyote Basin, but it is unknown if any exist on the Colorado side.
Grizzly Bear (<i>Ursus arctos horribilis</i>)	Federally listed as threatened. No longer known in Colorado, this species was last documented in the late 1970’s. It was historically found throughout the state, but due to human population expansion, limited valuable habitat remains in the state.
Whooping Crane (<i>Grus Americana</i>)	Federally listed as endangered. This large shorebird is rare and historically occurred in northeastern Colorado. The last remaining wild bird in the reintroduced Rocky Mountain Population died in the spring of 2002.
Southwestern Willow Flycatcher (<i>Empidonax traillii extimus</i>)	Federally listed as endangered. This small riparian species is found in south central and southwestern Colorado along larger river systems with dense cottonwood and willow dominated riparian galleries.

Preble's Meadow Jumping Mouse (<i>Zapus hudsonius preblei</i>)	Federally listed as threatened. This small mammal is found along the Rocky Mountain front range in Colorado from Colorado Springs north into central Wyoming. It is found within riparian vegetation adjacent to streams.
Piping Plover (<i>Charadrius melodus</i>)	Federally listed as threatened. This small shore bird is occasionally found in small to large water impoundments primarily in eastern Colorado.
Lesser Prairie Chicken (<i>Tympanuchus pallidicinctus</i>)	Federally listed as threatened. This medium sized grouse is native to southeastern Colorado, southwest Kansas, eastern New Mexico, northern Texas, and the Oklahoma panhandle. It is a short-grass prairie obligate species.
Gunnison Sage Grouse (<i>Centrocercus minimus</i>)	Federally listed as threatened. This medium chicken sized bird is native to the Gunnison Valley, and other sagebrush habitats of southwest Colorado and southeast Utah. It is a sagebrush obligate species that requires expansive in-tact habitat with native grasses and forbs.
Pawnee Montane Skipper (<i>Hesperia leonardus montana</i>)	Federally listed as threatened. This butterfly occurs only in the South Platte Canyon River drainage system in Colorado. It occurs in dry, open, ponderosa pine woodlands, and moderately steep slopes with soils derived from Pikes Peak granite. Blue gramma grass, and prairie gayfeather are two necessary components of the groundcover strata for this species and are important as food sources.
Least Tern (<i>Sterna antillarum</i>)	Federally listed as endangered. The smallest member of the gull and tern family, this species will dive into water for small fish. It historically bred within the Mississippi River system in eastern Colorado.
Red Knot (<i>Calidris canutus rufa</i>)	Federally listed as threatened. This medium sized shore bird migrates annually between its breeding grounds in the Canadian Arctic and several wintering regions, including the Southeast United States and points further south. During both northbound (spring) and southbound (fall) migrations, red knots use key staging and stopover areas to rest and feed including parts of Colorado.
Gray Wolf (<i>Canis lupus</i>)	Federally listed as endangered. This keystone predator was once common in Colorado but is now rare. It has a wide range of habitats in which it can thrive, reflecting the species adaptability. Stable to increasing populations exist to the north in Wyoming, Idaho, Montana, and eastern Oregon and Washington.
Canada lynx (<i>Lynx Canadensis</i>)	Federally listed as threatened. Canada lynx occupy high-latitude or high-elevation coniferous forests characterized by cold, snowy winters and an adequate prey base. In the western US, lynx are associated with mesic forests of lodgepole pine, subalpine fir, Engelmann spruce, and quaking aspen in the upper montane and subalpine zones, generally between 8,000 and 12,000 feet in elevation. Although snowshoe hares (<i>Lepus americanus</i>) are the preferred prey, lynx in also feed on mountain cottontails (<i>Sylvilagus nuttallii</i>), pine squirrels (<i>Tamiasciurus hudsonicus</i>), and blue grouse (<i>Dendragapus obscurus</i>). The Forest Service has mapped suitable denning, winter, and other habitat for lynx within the state. The mapped suitable habitat comprises areas known as Lynx Analysis Units (LAUs) that are the approximate the size of a female's home range. Several LAUs across the state include select parcels of BLM lands.
Mexican spotted owl (<i>Strix occidentalis lucida</i>)	Federally listed as endangered. This owl nests, roosts, and hunts in mature coniferous forests in canyons and foothills. The key habitat components are old-growth forests with uneven-age stands, high canopy closure, high tree density, fallen logs and snags. The only extant populations in Colorado are in the Pikes Peak and Wet Mountain areas of south-central Colorado and the Mesa Verde area of southwestern Colorado.
Yellow-billed cuckoo (<i>Coccyzus americanus</i>)	Federally listed as Threatened. This secretive species occurs in mature riparian forests of cottonwoods and other large deciduous trees with a well-developed understory of tall riparian shrubs. Western cuckoos breed in large blocks of riparian habitats, particularly woodlands with cottonwoods (<i>Populus fremontii</i>) and willows (<i>Salix</i> sp.). A few sightings of yellow-billed cuckoo have occurred in western Colorado along the Colorado River near Grand Junction.
Uncompahgre fritillary	Federally listed as endangered. The butterfly has been verified at only two areas

butterfly (<i>Boloria acrocne</i>)	in the San Juan Mountains in Colorado. There is anecdotal evidence of other colonies in the San Juans and southern Saguache ranges in Colorado. The butterfly exists above tree line on north and east facing slopes in patches of its larval host plant, snow willow. The greatest threat is butterfly collecting. Climatological patterns, disease, parasitism, predation, and trampling of larvae by humans and livestock pose additional threats.
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For the complete list of the Colorado BLM State Director's current Sensitive Species List for terrestrial wildlife species, birds, and reptiles, see Appendix A.

Environmental Consequences.

Proposed Action. Rotenone is a fish specific toxicant that only affects fish, gill breathing aquatic insects, and gill breathing stages of sub-adult amphibians. The effects to these species are addressed above in the **THREATENED, ENDANGERED, AND SENSITIVE SPECIES - AQUATIC WILDLIFE** section. Rotenone disrupts oxygen intake into the gills of these aquatic organisms. The chemical does not accumulate in organs, or body tissue of these organisms. Rotenone is highly toxic to fish and other aquatic life, but has low toxicity to birds and mammals (Ling 2003). Most mammal species are relatively resistant to rotenone, and rotenone is not easily absorbed in larger animals and does not accumulate in the body. Birds and mammals are much less sensitive to rotenone than are fish and aquatic invertebrates and poisoning caused by drinking treated water or eating poisoned fish is extremely unlikely (Ling 2003).

Special status insectivorous bats could be slightly impacted by a reduction in stream produced adult insects caused by the killing of some life stages of aquatic insects due to the chemical treatment. This would be site specific and non-treated stream reaches adjacent to the treatment reach would still produce adult insects for prey consumption. Bats may need to alter or expand feeding areas for a short time in order to find prey. The overall effect to bats would be expected to be short-term and undetectable.

Since rotenone is applied directly to water, there is little likelihood that terrestrial forage items for birds or mammals would contain rotenone residues from this use. Exposure to rotenone could occur to select terrestrial wildlife species through direct contact, ingestion of treated water, and consumption of aquatic organisms killed by rotenone. Finlayson et al. (2000) found that any wildlife which happens to consume water or dead fish treated with rotenone would not be adversely affected. All birds and mammals have enzymes in the digestive tract that neutralize rotenone. Also, rotenone residues in dead fish are generally very low (<0.1 ppm) and not readily absorbed through the gut of the animal eating fish. Birds and mammals that eat dead fish and drink treated water would not be expected to be affected. Finlayson et al. (2000) also found that a bird weighing ¼ pound would have to consume 100 quarts of treated water or more than 40 pounds of fish and invertebrates within a 24-hour period to receive a lethal dose of rotenone. This same bird would normally consume 0.2 ounces of water and 0.32 ounces of food daily.

After its release, rotenone rarely persists for more than a few weeks in the environment. Therefore, there would be no effect to birds and mammals from consuming water treated with

rotenone or dead fish containing rotenone. Rotenone would be applied directly to the water's surface. Because of this delivery method, the only likely route of exposure to rotenone for terrestrial wildlife would be through consuming water or dead fish treated with rotenone.

Because birds and mammals are not adversely affected by consuming water or dead fish treated with rotenone, and the lack of indirect, direct, or cumulative effects of rotenone on terrestrial wildlife species, the proposed action would be expected to have “**No Effect**” on any federally Threatened, Endangered, or Proposed terrestrial species or their habitats especially at the programmatic level. In the event that a site specific project would be determined to have effects to any listed species, Section 7 consultation with the U. S. Fish & Wildlife Service would be initiated and completed prior to any implementation. In addition, no effects to BLM Colorado sensitive mammal, bird, or reptile species would be expected other than negligible effects to insectivorous bat species.

No Action Alternative. Under the No Action alternative, no authorization to release chemicals on BLM managed lands would be completed at the programmatic level. No impacts to special status terrestrial wildlife would be anticipated.

Analysis of Public Land Health Standard 4 for Threatened, Endangered, and other Special Status Terrestrial Wildlife.

Land Health Assessments for the specific treatment area should be conducted or past assessments consulted to determine the status for threatened, endangered, and other special status terrestrial wildlife within project areas. Rotenone has no negative effects to terrestrial or avian species. It is likely that treatments have the potential to improve food webs as nonnative fish are removed and replaced with native species. This may improve trophic level food webs and provide better forage for birds, bats, and other terrestrial animals and their preferred prey. In the long-term the proposed action should have either no bearing or improve special status terrestrial species and their habitats. The proposed action would help with the meeting of this land health standard in BLM Field Offices across Colorado.

MIGRATORY BIRDS

Affected Environment.

BLM Instruction Memorandum No. 2008-050 provides guidance toward meeting the BLM's responsibilities under the Migratory Bird Treaty Act (MBTA) and the Executive Order (EO) 13186. The guidance directs BLM Field Offices to promote the maintenance and improvement of habitat quantity and quality for migratory birds. The guidance also directs the BLM to avoid, reduce or mitigate adverse impacts on the habitats of migratory bird species of conservation concern to the extent feasible, and in a manner consistent with regional or statewide bird conservation priorities.

The MBTA prohibits the “take” of a protected species. Under the Act, the term “take” means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The USFWS interprets “harm” and “kill” to include loss of eggs or nestlings

due to abandonment or reduced attentiveness by one or both adults as a result of disturbance by human activity, as well as physical destruction of an occupied nest.

The 1988 amendment to the Fish and Wildlife Conservation Act mandates the USFWS to “identify species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act (ESA) of 1973.” The “*Birds of Conservation Concern 2008*” (USFWS 2008) is the most recent effort to carry out this mandate. The conservation concerns are the result of population declines - naturally or human-caused, small ranges or population sizes, threats to habitat, or other factors.

Although there are general patterns that can be inferred, there is no single reason why any species is included on the list. Habitat loss is believed to be the major reason for the declines of many species. When considering potential impacts to migratory birds, the degree of impact on habitat must be taken into account, including:

- 1) the degree of fragmentation/connectivity expected from the proposed project relative to before the proposed project; and
- 2) the fragmentation/connectivity within and between habitat types (e.g., within nesting habitat or between nesting and feeding habitats).

Continued private land development, surface disturbing activities in key habitats (e.g. riparian areas) and the proliferation of roads, pipelines, power lines and trails are local factors that can reduce habitat quality and quantity for many species.

The State of Colorado is within the Southern Rockies/Colorado Plateau Bird Conservation Region (BCR). The 2008 list of Birds of Conservation Concern are described in Table 8.

Table 8. 2008 List of Birds of Conservation Concern

Species	Information/Range/Habitat Description
Gunnison sage-grouse (<i>Centrocercus minimus</i>)	Requires sagebrush communities for hiding and thermal cover, food, and nesting; open areas with sagebrush stands for leks; sagebrush-grass-forb mix for nesting; wet meadows for rearing chicks. Found in the SW portion of CO
American bittern (<i>Botaurus lentiginosus</i>)	Inhabits marshes and wetlands; ground nester. Summer resident in Colorado.
Bald eagle (<i>Haliaeetus leucocephalus</i>)	Bald eagles were removed from the federal threatened and endangered species list in 2007 but are still protected under the MBTA. Bald eagles occasionally summer in this region but usually winter (mid-Nov. to mid-April) along rivers and major tributaries in Colorado. Large mature cottonwood trees along the rivers and their major tributaries are used as roosting and perching sites, and these waterways provide the main food sources of fish and waterfowl. Upland habitats adjacent to these waterways are used as scavenging areas.
Ferruginous hawk (<i>Buteo regalis</i>)	Requires open, rolling and/or rugged terrain in grasslands and shrub steppe communities; also grasslands and cultivated fields; nests on cliffs and rocky outcrops. Fall/winter resident, non-breeding.
Golden eagle (<i>Aquila chrysaetos</i>)	Requires open country, grasslands, woodlands, and barren areas in hilly or mountainous terrain; nests on rocky outcrops or large trees. Year-round resident, breeding.

Species	Information/Range/Habitat Description
Peregrine falcon (<i>Falco peregrines</i>)	Requires open country near cliff habitat, often near water such as rivers, lakes, and marshes; nests on ledges or holes on cliff faces and crags. Spring/summer resident, breeding.
Prairie falcon (<i>Falco mexicanus</i>)	Requires open country in mountains, steppe, or prairie; winters in cultivated fields; nests in holes or on ledges on rocky cliffs or embankments. Spring/summer resident, breeding.
Snowy plover (<i>Charadrius alexandrinus nivosus/tenuirostris</i>)	Requires sparsely vegetated sand flats associated with pickleweed, greasewood, and saltgrass. Spring migrant, non-breeding. Spring migrant, non-breeding.
Mountain plover (<i>Charadrius montanus</i>)	Requires high plain, cultivated fields, desert scrublands, and sagebrush habitats, often in association with heavy grazing, sometimes in association with prairie dog colonies; short vegetation.
Long-billed curlew (<i>Numenius americanus</i>)	Requires lakes and wetlands and adjacent grassland and shrub communities. Spring/fall migrant, non-breeding.
Burrowing owl (<i>Athene cunicularia</i>)	Requires open grasslands and low shrublands often in association with prairie dog colonies; nests in abandoned burrows created by mammals; short vegetation.
Lewis's woodpecker (<i>Melanerpes lewis</i>)	Requires open woodland, often logged or burned, including oak, coniferous forest (often ponderosa), riparian woodland, and orchards, less often in pinyon-juniper.
Willow flycatcher (<i>Empidonax traillii</i>)	Requires riparian and moist, shrubby areas; winters in shrubby openings with short vegetation. Fairly common summer resident in open valleys and mountain parks, breeding.
Gray vireo (<i>Vireo vicinior</i>)	Uncommon summer resident. Inhabits open pinyon-juniper woodlands.
Pinyon jay (<i>Gymnorhinus cyanocephalus</i>)	Common to abundant resident of pinyon-juniper woodlands. Year-round resident that travels broadly in flocks.
Juniper titmouse (<i>Baeolophus ridgwayi</i>)	Pinyon-juniper woodlands, especially juniper; nests in tree cavities. Requires mature tree cavities for nesting and roosting. Year-round resident, breeding.
Veery (<i>Catharus fuscescens</i>)	Requires dense riparian thickets and hillside brush near streams. Uncommon spring/fall migrant in Eastern Colorado.
Bendire's thrasher (<i>Toxostoma bendirei</i>)	Requires desert, especially areas of tall vegetation, cholla cactus, creosote bush and yucca, and in juniper woodland - possible summer resident.
Grace's warbler (<i>Dendroica graciae</i>)	Breeds in ponderosa pine forests. Uncommon summer resident in southwest Colorado.
Grasshopper sparrow (<i>Ammodramus savannarum</i>)	Requires open grasslands and cultivated fields. Uncommon, non-breeding spring migrant in western Colorado and common summer resident in eastern Colorado.
Chestnut-collared longspur (<i>Calcarius ornatus</i>)	Requires open grasslands and cultivated fields. Uncommon, non-breeding spring migrant in western Colorado and common summer resident in eastern Colorado.
Black rosy-finch (<i>Leucosticte atrata</i>)	Requires open country including mountain meadows, high deserts, valleys. Breeds/nests in alpine areas near rock piles and cliffs. Irregular to rare winter resident, non-breeding.
Brown-capped rosy-finch (<i>Leucosticte australis</i>)	Summer resident/breeding in alpine meadows, cliffs, and talus and high-elevation parks and valleys. Irregular to rare winter resident in lower mountain areas.
Cassin's finch (<i>Carpodacus cassinii</i>).	Requires open montane coniferous forests; breeds/ nests in coniferous forests. Year-round resident, breeding.
Yellow-billed cuckoo (<i>Coccyzus</i>)	Requires densely wooded riparian areas with willow, cottonwood, and in some cases nonnative tamarisk.

Species	Information/Range/Habitat Description
<i>americanus</i>)	
Brewer's sparrow (<i>Spizella breweri</i>)	Requires sagebrush and grassland parks.

Environmental Consequences.

Proposed Action. The proposed action would result in minimal ground disturbance and limited noise. If beaver dam breaching is required, blasting could result in noise and short-term (3-5 days) avoidance of the area by resident bird species. All work would be done within 3-5 days via personnel on foot. All work would be performed after the nesting season for migratory birds.

The only potential impacts would be limited displacement of birds from near the stream treatment reach due to human presence and noise associated with the treatment. Insectivorous birds could be slightly impacted by a reduction in stream insects caused by the killing of aquatic insects due to the chemical treatment. This would be site specific and non-treated areas adjacent to the treatment reach would still produce adult insects for prey consumption. Birds would have to move short distances for a short time in order to find prey. The overall effect for migratory birds is expected to be short-term and negligible. Therefore, the proposed action may slightly affect individuals but is unlikely to have a measurable impact on species or populations or their viability on a landscape scale.

No Action Alternative. Under the No Action alternative, no authorization to release chemicals on BLM managed lands would be completed at the programmatic level. No impacts to migratory birds would be anticipated.

WILD AND SCENIC RIVERS

Affected Environment.

Select treatment reaches could be located within waters identified as eligible or suitable for inclusion into the National Wild and Scenic Rivers System under the Wild and Scenic Rivers Act. This system is based on eligibility and suitability studies that determine if waters have outstanding remarkable values (ORVs) and meet the free flowing criteria upon which interim designations are based. Identified stream segments have tentative classifications of wild, scenic, or recreational.

Environmental Consequences.

Proposed Action. Section 16(b) of the Wild and Scenic Rivers Act defines free flowing as “existing or flowing in a natural condition without impoundment, diversion, straightening, rip-rapping, or other modification of the waterway.” Beaver dams are temporary structures that sit within the waterway, and they are not part of the permanent waterway (the bed and banks of the stream). The Proposed Action would not permanently alter either the bed or banks. The proposed breaching of dams would not modify the beds and banks of the stream. If some

modification inadvertently occurs, it would be temporary in nature, because the stream would rapidly refill that modification with rocks and gravels. BLM Wild and Scenic Rivers Manual, Section 3.6.F specifies: "Construction of minor structures and vegetation management to protect and enhance wildlife and fish habitat should harmonize with the area's largely undeveloped condition and fully protect identified river values." The intent of the Proposed Action is to improve and enhance native fishes and treatments are planned in a manner so that the project would not modify free-flowing values or tentative classifications.

No long-term effects are expected to water quality, although short-term (one to three weeks) effects would be expected. For further analysis, see Water Quality, Surface and Ground. The Proposed Action would not affect eligible or suitable streams because the Proposed Action would not impact the free flowing nature of streams or alter stream beds or banks.

In select cases, it is possible that CPW activities as described in the Proposed Action could result in the direct mortality of some native fish. It is possible that these native fish could be identified ORV's for a particular stream reach. However, in the majority of cases, enhancement of those populations of fish is the goal of the treatment. Upon successful reclamation, it is anticipated that the larger population of native fish would improve in the absence of nonnative predatory and competitive species. CPW may choose to restock treated reaches with native species and therefore improve potential fish ORV's in the long term. For further information, see the Special Status Aquatic Species analysis.

No other ORV's would be permanently impaired or impacted by proposed treatments. All chemical treatment work would be done via foot travel and vehicles would be parked along existing roads. Equipment would be hiked in as appropriate.

No Action Alternative. Under the No Action alternative, no authorization to release chemicals on BLM managed lands would be completed at the programmatic level. It is possible that, where fish are identified as ORV's in select stream found suitable for wild and scenic river consideration, the No Action alternative could result in declines in those ORV fish species.

WILDERNESS STUDY AREAS / WILDERNESS CHARACTERISTICS

Affected Environment.

A total of five designated wilderness areas and 54 Wilderness Study Areas are currently managed by BLM in Colorado. In addition, three National Conservation Areas, and two National Monuments are managed by BLM in Colorado. It is possible that treatments could be identified and proposed within either designated wilderness areas, wilderness study areas, or areas managed for wilderness characteristics. These areas provide outstanding opportunities for solitude and for primitive and unconfined recreation including scenic attractions, hiking, hunting, wildlife viewing, camping, and sightseeing.

Environmental Consequences.

Proposed Action.

Naturalness. The breaching of beaver dams would result in a change to the appearance of the beaver dams. Breached dams would still look natural as the casual observer would only see breached dams that would look like they were breached naturally from natural high water flow events, and not a man-caused event. Therefore, the effects to naturalness from the dam beaching would be negligible because the stream would still generally appear to have been affected primarily by the forces of nature. Ecological naturalness would be enhanced because native fish species would replace nonnative fishes.

Solitude. Outstanding opportunities for solitude would not be altered because the proposed action would not result in changes in use. The use of mechanical equipment, primarily gas powered generators to power pumps at identified detoxification stations would impede upon solitude during the short-duration treatment and would need additional BLM authorization. CPW would have to consider minimum tool protocols to still achieve adequate detoxification without the use of pumps.

Primitive Recreation and Supplemental Features. Most importantly, the Proposed Action would not affect visitors hiking, hunting, sight-seeing, camping, wildlife viewing or other reasons for visitation. There could be a short-term negative effect to visitors seeing dead fish in and along a treatment stream. However, nutrient recycling should occur quickly as dead fish would provide a food source for other animals and rapidly disappear. See the Recreation analysis for further information.

In summary, the Proposed Action would have negligible effects to wilderness characteristics of naturalness, solitude, and primitive recreation and supplemental features. Breaching of dams would mimic natural disturbance and is anticipated to be short-term as streams are dynamic systems that are constantly changing. It is possible that select wilderness values and aspects of proposed treatments would conflict. In that event, site specific analysis may be needed to authorize a treatment in wilderness and could incorporate this PEA by reference for the majority of effects.

No Action Alternative. Under the No Action alternative, no authorization to release chemicals on BLM managed lands would be completed at the programmatic level. No impacts to wilderness areas or wilderness values would be anticipated.

TERRESTRIAL WILDLIFE

Affected Environment.

A variety of non-special status terrestrial wildlife species utilize riparian and stream habitats. Common groups of terrestrial wildlife include small mammals, carnivores, reptiles, birds, and big game. Example species include cottontail rabbit (*Sylvilagus floridanus*), coyote (*Canis latrans*), bobcat (*Lynx rufus*), beaver (*Castor Canadensis*), muskrat (*Ondatra zibethicus*), river otter (*Lontra canadensis*), mountain lion (*Puma concolor*), mule deer (*Odocoileus hemionus*), elk (*Cervus Canadensis*), moose (*Alces americanus*), bighorn sheep (*Ovis Canadensis*),

pronghorn (*Antilocapra americana*), various bats (various species), garter snakes (*Thamnophis sirtalis*), and various songbirds (various species). Special Status Terrestrial species are addressed in the Threatened, Endangered, and Sensitive Species section.

Environmental Consequences.

Proposed Action. The CPW activities described in the Proposed Action could affect terrestrial wildlife through direct disturbance from human presence in treatment areas. Beaver habitat would be altered as part of the project with the breaching of beaver dams. Beaver would also be directly impacted because they could be removed from the treatment reach prior to treatment. Trapping and removal of beaver would induce stress and could result in direct mortality to individuals. Beaver are desirable because they create excellent pool/holding habitat for fish. Temporary disturbance to other terrestrial species may occur during the treatment because human use would increase in the area. This temporary displacement and habitat avoidance of some species away from areas of intensive human presence would be short-term.

Since rotenone is applied directly to water, there is little likelihood that terrestrial forage items for birds would contain rotenone residues from this use. Exposure to rotenone could occur to select bird species through direct contact, ingestion of treated water, and consumption of aquatic organisms killed by rotenone. Finlayson et al. (2000) found that any wildlife which happens to consume water or dead fish treated with rotenone would not be adversely affected. All birds and mammals have enzymes in the digestive tract that neutralize rotenone. Also, rotenone residues in dead fish are generally very low (<0.1 ppm) and not readily absorbed through the gut of the animal eating fish. Birds and mammals that eat dead fish and drink treated water would not be affected. Finlayson et al. (2000) also found that a bird weighing ¼ pound would have to consume 100 quarts of treated water or more than 40 pounds of fish and invertebrates within a 24-hour period to receive a lethal dose of rotenone. This same bird would normally consume 0.2 ounces of water and 0.32 ounces of food daily. Also after its release, rotenone rarely persists more than a few weeks in the environment. Therefore, there would be no effect to birds and mammals from consuming water treated with rotenone or dead fish containing rotenone. Rotenone would be applied directly to the water's surface. The only likely route of exposure to rotenone for terrestrial wildlife would be through consuming water or dead fish treated with rotenone.

Rotenone “is highly toxic to fish and other aquatic life, but has low toxicity to birds and mammals” (Ling 2003). Ling (2003) also states, “Most mammal species are relatively resistant to rotenone,” “rotenone is not easily absorbed in higher animals and does not accumulate in the body,” and “Birds and mammals are much less sensitive to rotenone than are fish and aquatic invertebrates and poisoning caused by drinking treated water or eating poisoned fish is extremely unlikely.”

No Action Alternative. Under the No Action alternative, no authorization to release chemicals on BLM managed lands would be completed at the programmatic level. No impacts to terrestrial wildlife would be anticipated.

Analysis of Public Land Health Standard 3 for Terrestrial Wildlife.

Land Health Assessments for the specific treatment area should be conducted or past assessments consulted to determine the status for terrestrial wildlife within project areas. Rotenone has no negative effects to terrestrial or avian species. It is likely that treatments have the potential to improve food webs as nonnative fish are removed and replaced with native species. This may improve trophic level food webs and provide better forage for birds, bats, and other terrestrial animals and their preferred prey. In the long-term the proposed action should have either no bearing or improve conditions for terrestrial wildlife species and their habitats. The proposed action would help with the meeting of this land health standard in BLM Field Offices across Colorado.

AQUATIC WILDLIFE

Affected Environment.

Proposed treatment waters would obviously contain fish. In most all cases they would contain undesirable non-native species that are either competitive, predatory, or have the ability to hybridize with desirable native or sport fish species of interest. Common fish species targeted for removal include Brook Trout, Brown Trout, Rainbow Trout, Northern Pike, White Sucker, Smallmouth Bass, and Carp among other less common species.

In addition to fish, target waters harbor some assemblage of macroinvertebrates or aquatic insects. Aquatic invertebrates are aquatic animals without backbones that live on the bottom of freshwater habitats during all or part of their life cycle and that are large enough to be seen with the naked eye. Major groups of macroinvertebrates include arthropods (i.e., crustaceans and insects), mollusks, sponges and nematode worms. The most abundant are typically immature life states (larvae) of aquatic insects such as mayflies, stoneflies, and caddis flies. The benthic macroinvertebrate community or “assemblage” is largely determined by the range of habitat conditions, such as water quality, vegetation structure and bottom substrate. More complex habitats generally support a more diverse assemblage than more uniform habitats. Aquatic insects are exceptionally important in the food web of many species including fish, some avian species, bats, some mammals, spiders, and amphibians.

Amphibians may also be present along potential treatment waters. In addition to those species discussed in the Special Status Aquatic Species section above, common species include western chorus frogs (*Pseudacris triseriata*), tiger salamanders (*Ambystoma tigrinum*), Woodhouse’s toads (*Anaxyrus woodhousii*), and American bullfrogs (*Rana catesbeiana*).

Environmental Consequences.

Proposed Action.

Fish. Rotenone is highly toxic to fish although different species have varying tolerance levels. In the aquatic environment, rotenone is readily transmitted across the permeable membranes of the gills. Fish are highly susceptible to low concentrations of rotenone. Potassium permanganate is toxic to gill-breathing organisms at the rate (2 to 6 mg/L) required for neutralization. Application of excess potassium permanganate could adversely affect

downstream fish populations; however, as described in the Proposed Action, CPW would avoid and minimize any effects of potassium permanganate on fish populations.

The short-term direct effects of the proposed action would be the eradication of all fish from treatment area waters, as well as the potential elimination of fish a short-distance downstream from the neutralization stations. Fish would be killed as a result of the toxicity of rotenone which disrupts the ability of fish to uptake oxygen through the gills. Fish may also be killed for 0.25-0.5 miles (0.4-0.8 km) below the neutralization station from the combined effects of the rotenone and potassium permanganate before mixing of the chemicals and neutralization can occur. As part of all proposed treatments, sentinel, caged fish, would be placed and monitored at locations downstream of the detoxification station to monitor detoxification effectiveness.

Aquatic invertebrates. The CPW activities as described in the Proposed Action would directly affect aquatic biota in the project area, including gill breathing aquatic invertebrates. Aquatic invertebrates are less sensitive to rotenone than fish. However, impacts from both rotenone and potassium permanganate may occur and differential effects could occur on different species assemblages. Macroinvertebrates play a key role in aquatic ecosystem function and are an important food source for fish and terrestrial fauna.

In general, benthic macroinvertebrate communities tend to be more tolerant of rotenone than most fishes, but individual macroinvertebrate species have varying ranges of rotenone tolerance (Engstrom-Heg et al. 1978, Chandler and Marking 1982, Mangum and Madrigal 1999, Finlayson et al. 2010b, Vinson et al. 2010). The sensitivity of individual species and life stages to rotenone appears related to their oxygen uptake process (Engstrom-Heg et al. 1978). Smaller invertebrates appear more sensitive than larger invertebrates, and species that use gills to extract aqueous oxygen are more sensitive than species that obtain oxygen through other means (Vinson et al. 2010). The insect orders Ephemeroptera (mayflies), Plecoptera (stoneflies), and some Trichoptera (caddisflies) (EPT taxa) are all gill breathers. These EPT taxa are a major component in the trout diet. They are less tolerant to environmental stressors than other aquatic invertebrate groups and have not been found after some rotenone treatments (Mangum and Madrigal 1999). Finlayson et al. (2010a) found that mayflies appeared to be the most susceptible taxa to rotenone. Sensitivity to rotenone can also vary within the same taxonomic order. Whelan (2002) reported that while caddisflies (Trichoptera) had the highest number of species affected by rotenone, many caddisflies were tolerant.

Potassium permanganate is considered toxic to aquatic invertebrates and zooplankton, although there is likely to be a wide tolerance range among various freshwater invertebrates. The mixture of rotenone and potassium permanganate during the neutralization process could adversely affect benthic macroinvertebrates in the neutralization zone, extending approximately 0.25 to 0.5 mile (0.4-0.8 km) below the fish barriers. The macroinvertebrate resources within the neutralization zone would be expected to re-establish within a few months after the neutralization treatment ends. Areas below the detoxification mixing point as well as nearby tributary streams, springs, and seeps, would serve as sources for recolonization. As a result, no taxa are expected to be lost, and re-establishment is expected to occur within a few months, resulting in temporary, short-term impacts.

Amphibians. Impacts from the use of rotenone are possible on amphibians particularly at the sub-adult life stage when tadpoles are in a gill breathing life stage. Rotenone is generally less toxic to amphibians than fish. Rotenone may be absorbed into both skin and respiratory membranes, but skin may present more of a barrier because it creates a greater distance for the chemical to diffuse across (Fontenot et al. 1994), and a smaller surface area relative to gill structures. Studies suggest that tadpoles and other larval forms of amphibians that utilize gills for respiration are just as sensitive to rotenone as fishes, while adult forms, which no longer utilize gills, are much less susceptible to rotenone. Larval amphibians appear to have resistance roughly equivalent to those of the most tolerant fish species.

Potential direct impacts to amphibians include absorption of rotenone during project implementation. Amphibians in their terrestrial life stage should not be affected by the rotenone treatment; however, those in gill-breathing life stages, if present, would be susceptible. While at least some mortality of aquatic stages of amphibians is possible from CPW's rotenone application, several studies have shown that population level effects do not occur to amphibian species during rotenone treatments (Billman 2010, McCoid and Bettoli, 1996).

Potential indirect impacts on amphibians include loss of prey species from the rotenone treatment. For example, reductions in emerging aquatic insects could occur, particularly if multiple treatments are required; however, aquatic insect abundance is expected to recover quickly through drift from untreated upstream areas, by immigration of adults from non-impacted downstream reaches, or from life stages of existing bugs not in a gill breathing life stage. In many cases current populations of non-native fish are having adverse effects on amphibian populations through predation, competition for prey resources, and alteration of native and natural food webs. Removal of non-native fishes may benefit resident amphibians over the long-term. Several studies have shown the removal of non-native trout can result in an increase in abundance and diversity of amphibian populations (Hoffman et al. 2004, Vrendenberg 2004, Knapp et al. 2007, and Pope 2008).

Most amphibians, such as toads, present during a late summer/early autumn treatment would have completed their metamorphosis to the adult stage. Thus, they would be past the gill breathing life stage and have limited potential to be impacted. Design Feature #8 calls for conducting reclamation treatments after August 10th. This would help protect amphibians, since most individuals would have morphed from juvenile gill breathing life stages to adults. If conducted prior to this date, it is likely that some individual mortality to resident amphibians would result. Population level effects would not be anticipated.

No Action Alternative. Under the No Action alternative, no authorization to release chemicals on BLM managed lands would be completed at the programmatic level. In the absence of these treatments, native or desirable fish species management could suffer as nonnative species would continue to persist and dominate select waters.

Analysis of Public Land Health Standard 3 for Aquatic Wildlife.

Land Health Assessments for the specific treatment area should be conducted or past assessments consulted to determine the status for aquatic species and their habitats within

project areas. Proposed treatments would likely improve conditions for aquatic species in the long-term as emphasis is on native fish. It is likely that treatments have the potential to improve food webs as nonnative fish are removed and replaced with native species. In the long-term the proposed action should have either no bearing or improve aquatic species and their habitats. The proposed action would help with the meeting of this land health standard in BLM Field Offices across Colorado.

WETLANDS & RIPARIAN ZONES

Affected Environment.

Proposed treatments would occur directly within live water. These habitats are often bordered by riparian vegetation assemblages and water dependent species. Primary riparian communities across Colorado generally consist of Herbaceous (sedge, rush, grasses), Deciduous Forests (cottonwoods, boxelder, Rocky Mountain maple) Mixed Deciduous-Coniferous Forests (cottonwoods, alder, Rocky Mountain juniper, blue spruce, Douglas Fir), and Coniferous Forests (blue spruce, Engelmann spruce, subalpine fir) (Kittel et al, 1999) . Several riparian plant community assemblages can occur in each of these riparian types.

Environmental Consequences.

Proposed Action. Impacts to riparian vegetation would occur primarily associated with proposed beaver/beaver pond removal. The breaching of beaver dams and draining of beaver ponds would disconnect riparian vegetation on the perimeter of ponds from the perennial water source. This could result in some limited die-off of willows and riparian grasses and sedges. However, impacts would likely be minor as distance to water would still be minimal and willows would still have access to shallow groundwater. The areas devoid of water along the pond margins would provide a niche for invasive weeds to become established. It is likely that common weeds of along riparian areas including houndstongue (*Cynoglossum officinale*) and thistles (i.e. *Cirsium arvense*, *C. vulgare*, *Carduus acanthoides*, *C. nutans*) could invade and increase along drained pond margins. However, these impacts are anticipated to be short-term as beaver pond complexes are dynamic and vary naturally in abundance, size, and density. Natural blowouts are common and natural spring and summer high flow events would likely maintain stream channels and scour areas where weeds would try to establish.

The removal of beaver dams could result in some short term (<2 years) disturbance to adjacent riparian vegetation near the dam. Mechanical damage could occur but would be minimal in scope. These effects would be short-term as beaver dam dismantling would occur over a 2-3 day period and damaged vegetation would expect to rebound to pre-existing conditions within one year post disturbance. However, it is possible that even with beaver reintroduction; some pond areas would not be re-created at the pre-existing site. It is anticipated that riparian vegetation would fill in quickly as the stream adjusts at these sites. Weeds are not likely to establish permanence in the old ponds as spring stream flows would negate their establishment long-term. Long-term (>2 years) impacts to riparian vegetation could result from beaver dam breaching if stream channel stability is compromised. This could result in losses of riparian

vegetation within and downstream of the treatment reach until such time as equilibrium is achieved. These potential impacts would vary in intensity, magnitude, and duration based on the site specific stream channel type, gradient, local geology, and number and sizes of beaver dams to be breached. These factors would be considered prior to any treatment potentially involving beaver dam breaching.

The chemical treatment itself would have very minimal impact to riparian vegetation in the form of human trampling over a 5 day period as personnel set up and monitor drip stations, hike the treatment reach with backpack sprayers, and monitor chemical rates of spread and fish kill efficiency. Human use in the area for up to 5 days could result in some minimal vegetation trampling primarily to riparian grasses and sedges, but impacts would be short-term and largely undetectable.

No Action Alternative. Under the No Action alternative, no authorization to release chemicals on BLM managed lands would be completed at the programmatic level. No impacts to riparian zones and wetlands would be anticipated.

Analysis of Public Land Health Standard 2 for Riparian Systems.

Land Health Assessments for the specific treatment area should be conducted or past assessments consulted to determine the status of riparian areas within project areas. Proposed treatments would likely have no bearing on long-term riparian vegetative health.

WATER QUALITY, SURFACE AND GROUND

Affected Environment.

Proposed treatments would occur in live waters. The State of Colorado has developed *Stream Classifications and Water Quality Standards* that identify beneficial uses of water and numeric standards used to determine allowable concentrations of water quality parameters (CDPHE 2013). Each stream segment in the state has specific use classifications and numeric standards. An example stream segment with use classifications and numeric standards is described in Table 9.

Table 9. Stream Segment Descriptions.

Stream Segment Description	Classifications	Numeric Standards*
11a. Mainstem of the West Fork of Parachute Creek, including all tributaries, from its source to West Fork Falls. Mainstem of East Fork of Parachute Creek, including all tributaries and wetlands, from a point immediately below the mouth of First Anvil Creek to the east boundary line of S27, T5S, R95W.	Aq Life Cold 1 Recreation N Water Supply Agriculture	T = TVS(CS-I) °C D.O. = 6.0 mg/l D.O.(sp) = 7.0 mg/l pH = 6.5-9.0 <i>E.coli</i> = 630/100ml

Aquatic Life Cold 1 indicates that a stream segment is capable of sustaining a wide variety of cold water biota. Recreation N refers to stream segments in which surface waters are not suitable or intended to become suitable for primary contact recreation uses. Water supply and

agriculture refer to stream segments that are suitable or intended to become suitable for potable water supplies and suitable for irrigation or livestock use.

The State of Colorado has a *303 (d) List of Impaired Waters and Monitoring and Evaluation List* that identifies stream segments that are not currently meeting water quality standards with technology-based controls alone or suspected to have water quality problems (CDPHE 2012). Each water body on the list must have a Total Maximum Daily Load Assessment (TMDL) prepared. The TMDL calculates the maximum quantity of a pollutant that may be added to a water body from all sources, including point sources, nonpoint sources, and natural background sources, without exceeding the applicable water quality criteria for that pollutant. The assessment also quantifies how much the pollutant would need to be reduced to meet the criteria.

Environmental Consequences.

Proposed Action. The proposed action would result in short-term direct effects to water quality relating to the Colorado water quality classification and numeric standard 1, Aquatic Life Cold. The primary direct effect would be the toxicity of rotenone and potassium permanganate to aquatic organisms including fish and invertebrates. Additional direct short-term effects to water quality as a result of the chemical treatment with rotenone and potassium permanganate would be to primary contact recreation and secondary contact recreation where there is a low likelihood of ingestion of water or a low degree of bodily contact with the water. Examples include, but are not limited to, wading, hunting, and fishing. The design features would be followed to mitigate for human recreational exposure to rotenone and also provide an operating protocol for public notification of treatment area restrictions prior to, during, and following application of rotenone. Rotenone dissipates in flowing waters relatively rapidly (often less than 24 hours) due to dilution and increased rates of hydrolysis and photolysis (Finlayson et al. 2000, Brown 2010). Rotenone is non-toxic to mammals, including humans. At the concentrations used to kill fish, it has been estimated that a 132-lb person would have to consume over 60,000 liters of treated water at one sitting to receive a lethal dose (Sousa et al, 1987). In addition, extensive testing has not shown rotenone to be carcinogenic (Bradbury 1986).

Due to the strong tendency of rotenone to bind with organic soils, sediment, and vegetative matter, it is unlikely to move through most soils into groundwater. In very sandy soils with low organic content there is some potential for leaching, but penetration would be expected to be limited to no more than 3 inches (EPA 2007). No known groundwater well-monitoring, associated with rotenone treatments, has documented a detection of rotenone or other rotenone metabolites (Finlayson et al. 2000, Turner et al. 2007). In addition, rotenone breaks down quickly into temporary residues that would not persist as pollutants of groundwater. Ultimately rotenone breaks down into carbon dioxide and water.

Liquid piscicide formulations of rotenone including CFT Legumine™ and Prenfish Toxicant®, contain inerts, adjuvants, metabolites, impurities, and contaminants in addition to the active ingredient rotenone. These are used to disperse it in water because rotenone does not dissolve in water effectively on its own. Prenfish Toxicant® contains a petroleum solvent that may

contain ingredients with the potential to affect water quality including compounds such as benzene, xylene, naphthalene, toluene, and trichloroethylene. However, when the EPA drinking water standard, Maximum Contaminant Level (MCL) for short term or long term ingestion is computed for each of the compounds, the resultant concentrations are several orders of magnitude below the MCL when applied to streams at a toxic dose of rotenone to fish (Ott, 2008).

The other liquid product, CFT Legumine does not contain the same alkylbenzene solvent. It uses N-methylpyrrolidone (NMP) as a solvent instead. NMP is widely used in pharmaceutical ingredients and has a substantial body of toxicological research to support its use. When a toxic dose of CFT Legumine is applied to a stream, the resultant concentration of NMP is approximately 25 times less than the safe reference dose concentration of 2-6ppm (Ott, 2008).

Rotenone is a naturally occurring chemical obtained from the roots of several tropical and subtropical plant species belonging to the genus *Lonchocarpus* or *Derris*. It is considered a botanical pesticide by the National Organic Standards Board. Rotenone is currently approved by the USDA's National Organic Standards Board as an approved substance for use in organic agriculture (NOSB, 2012).

Potassium permanganate would be used by CPW to detoxify rotenone at the bottom end of the treatment reach during treatments. Potassium permanganate, a strong oxidizing salt, is often used in drinking water treatment plants and is also used to deactivate rotenone. It has been shown to be toxic to fish and aquatic organisms. Effects are expected to be short term and limited to the vicinity (within 30-minute travel time down current) of the rotenone deactivation area. Potassium permanganate would degrade to the nontoxic, common compounds of potassium, manganese, and water within an hour of application. The detoxification is not immediate in space but requires a short mixing zone where the potassium permanganate is in contact with and oxidizes the rotenone. Below this mixing zone both fish and aquatic macroinvertebrates would survive (Brown 2010).

There would be no direct effects to the State water quality designation of "agricultural uses" as a result of the CPW chemical treatment with rotenone. However, due to the concentration of agricultural operations in the North Fork of the Gunnison River with USDA Organic Certification, or on any streams where organic farms have irrigation diversions below the treatment area, the use of CFT Legumine would be preferable. CFT Legumine doesn't contain any alkylbenzene solvents, so in the event of a spill there would be less chance of exceeding water quality standards.

Beaver dam breaching would result in sediment movement, suspension of fine sediments in the water column, and increased turbidity. Initial breaching of beaver dams would result in sediment movement out of ponds and subsequent high flow pulse events would likely scour residual sediments. Sediments would flush through the treatment reach and would redistribute downstream. Impacts associated with increased suspended sediments and turbidity associated with the breaching of dams would be short-term (5 days or less). Beaver dams have been documented as capturing 100 to 5000 m³ of fine sediments per pond with an average of 500 m³ per pond (Butler and Malanson, 2005). The breaching of beaver ponds would result in a

reduction in watershed sediment capture rates. However, large, acute pulses of sediment and increased turbidity would not be expected to increase in the absence of beaver dams so no long-term impacts are anticipated.

Recolonization of treatment reaches by beaver would help to replace beaver pond habitat removed to facilitate the treatment. This should help to stabilize the stream channel and maintain and/or raise the water table. If sufficient beaver activity after the treatment does not occur, then impacts associated with beaver dam breaching could be longer-term. Longer-term (>2 years) impacts could include water storage decreases, decreases in base flow amounts, increased erosion, and potentially increased vertical instability of stream channels. Other impacts could include increases in nutrients (nitrogen, nitrates, and phosphorus, particularly during higher spring flows (Maret et al, 1987). The intensity, magnitude, and duration of impacts would vary based on the site specific stream channel type, gradient, local geology, and number and sizes of beaver dams breached. These impacts could occur until such time as the stream channel reaches equilibrium and riparian vegetation establishes to adequately stabilize stream beds and banks. These factors would be considered prior to any treatment potentially involving beaver dam breaching. Within the bankfull flow width it is unlikely that weeds or other early increaser vegetation species would establish as spring stream flows would preclude establishment of these species versus riparian vegetation that should reestablish within 1-2 years. Until riparian vegetation reestablishes to levels capable of stabilizing and maintaining the stream banks, there is the potential for all of the effects noted above should beaver activity not be sufficient post-treatment.

The reintroduction of beaver into a treated stream reach would be considered on a case by case basis with regard to the following factors: need, logistics (distance, transport time), and availability of animals and personnel. CPW manages beaver in the state and it is their call as to their ability to trap, transport, and move animals between aquatic systems. BLM would work with local CPW personnel to facilitate beaver reintroductions where environmental effects would be expected to be more severe or potentially longer-term given a potential removal of beavers and/or beaver dams.

Short-term impacts to water quality are expected to last no more than one week from the chemical treatment. As a result of transport, dilution, and the breakdown of rotenone compounds and the other ingredients present in liquid rotenone formulations, no long-term effects are expected to water quality, wetlands, or ground water as a result of activities associated with the proposed action. CDPHE also authorizes these chemical treatments and CPW submits their Reclamation Plan to them for concurrence. Impacts could be longer-term if beaver dam breaching is required. Increased nutrient loading could result in eutrophic conditions that support increased plant growth and a subsequent decrease in dissolved oxygen. If vertical stability is compromised, or stream flows are reduced these could result in longer term impacts. Again, these potential impacts would vary in intensity, magnitude, and duration based on the site specific stream channel type, gradient, local geology, and number and sizes of beaver dams to be breached. These factors would be considered prior to any treatment potentially involving beaver dam breaching.

No Action Alternative. Under the No Action alternative, no authorization to release chemicals

on BLM managed lands would be completed at the programmatic level. No impacts to water quality would be anticipated.

Analysis of Public Land Health Standard 5 for Water Quality.

Land Health Assessments for the specific treatment area should be conducted or past assessments consulted to determine the status of water quality standards within project areas. Proposed treatments would likely have no bearing on long-term water quality attainment or the meeting of Standard 5.

HAZARDOUS OR SOLID WASTES

Affected Environment.

Hazardous and solid wastes are not a part of the natural environment.

Environmental Consequences.

Proposed Action. Hazardous and solid wastes are unlikely to be introduced to the environment as a result of the implementation of the proposed action. However, because gasoline powered generators could be used at detoxification stations, there is some potential. To minimize impacts, all fuel, oil, and other lubricants would be secured in a vehicle away from the treatment water. All equipment would be in proper working condition, free of leaks prior to being brought onsite. Any leaks noted during work would be fixed as soon as identified and would be fixed outside of the stream channel.

Chemicals used to kill target fish species would be monitored and treated in order to quickly detoxify and would not persist in the environment. Given the design features in the proposed action, harmful environmental impacts would be eliminated.

No Action Alternative. Under the No Action alternative, no authorization to release chemicals on BLM managed lands would be completed at the programmatic level. No impacts associated with hazardous wastes would be anticipated.

ENVIRONMENTAL JUSTICE

Affected Environment:

The NEPA process requires a review of the environmental justice issues as established by Executive Order 12898 (February 11, 1994). The order established that each Federal agency identify any “disproportionately high and adverse human health or environment effects of its programs, policies, and activities on minority and low-income populations.”

Environmental Consequences:

Proposed Action. The proposed action is the State of Colorado’s action based on the management of priority fish species. No disproportionately high, adverse health or environmental effects have been identified that would impact low income or minority populations as a result of the authorization of the Proposed Action.

No Action Alternative. Under the No Action alternative, no authorization to release chemicals on BLM managed lands would be completed at the programmatic level. No impacts to minority or low income populations would be anticipated.

RECREATION

Affected Environment.

Water is an attractive area in which to recreate and numerous recreation activities are or could be associated with proposed treatment areas. Primary recreation activities associated with rivers and streams in Colorado include: fishing, hunting, wading, hiking, camping, sight-seeing, rock skipping, and general water play.

Environmental Consequences.

Proposed Action. Proposed treatment areas would be signed and appropriate notifications made regarding planned activities. This could include signing, press releases, or other public announcements to inform the public about planned activities. Signing would alert recreationist as to dates, and areas of treatment and request that the area be avoided during the treatment.

This would impact recreational users for the duration of the project (generally 3-5 days) because specific areas would have numerous personnel working in the area which could impact recreational users planned experiences. Given that work would primarily occur during the week and not on weekends this would reduce potential impacts to users. The proposed action could push users to other areas for a short duration. Overall, impacts would be minor, short-term, and site-specific.

No Action Alternative. Under the No Action alternative, no authorization to release chemicals on BLM managed lands would be completed at the programmatic level. No impacts to recreation would be anticipated.

HUMAN HEALTH AND SAFETY

This section addresses potential toxicological impacts on human and ecological health from the proposed use of rotenone and potassium permanganate as a piscicide and detoxifier to remove target fish. Application of rotenone and potassium permanganate to the environment could result in negative effects on human and ecological health.

Government agencies have conducted substantial research to determine the safety of rotenone for fisheries management applications in the re-registration approval process (Finlayson et al.

2010 and USEPA 2006). The EPA (2006) study found that while risks to terrestrial wildlife and plants were insignificant when rotenone was applied as a piscicide, risks to non-target aquatic organisms could be significant. The Forest Service contracted with Syracuse Environmental Research Associates, Inc. (SERA) to prepare a Human Health and Ecological Risk Assessment (HHERA) for rotenone to help identify exposure issues and potential mitigation measures needed beyond applying the rotenone formulation according to label directions for fisheries management (SERA 2008). The HHERA was used as the primary reference for evaluating the human health and ecological risks of the Proposed Action.

Affected Environment.

Air, surface water, groundwater, sediments and biota potentially containing rotenone or formulation constituents are considered potential exposure media.

Rotenone Toxicity. Rotenone is a naturally occurring chemical obtained from the roots of several tropical and subtropical plant species belonging to the genus *Lonchocarpus* or *Derris*. Liquid formulations of rotenone may contain petroleum hydrocarbons as solvents and emulsifiers to disperse rotenone in water (naphthalene, methylnaphthalenes, xylenes, etc.). The proportion of these carriers varies substantially by formulation, and formulations with synergists generally contain far less petroleum-based carrier products. The Proposed Action involves the use of commercial liquid rotenone formulations including CFT Legumine™ and Prenfish Toxicant® which contain dispersants and emulsifiers (Table 8). Powder formulations of rotenone proposed for use in treating lakes are made from ground plant roots. These powdered formulations may contain fillers, but no materials of concern are added. The potential effects on ecological receptors associated with rotenone and other constituents in the proposed formulations are discussed in the Environmental Consequences section below.

Table 10. Inerts contained in end-use liquid formulations of rotenone (from SERA 2008)

Formulation (% of formulation classified as inerts) ^a	Name of Inert	Inert % by Weight
CFT Legumine 5% (90% inerts) ^a	N-Methylpyrrolidone	9.8 % ^c
	1,2,4-Trimethylbenzene	0.003% ^c
	Naphthalene	0.02551% ^c
Prenfish Toxicant	Naphthalene	9.9 % ^c
	1,2,4-Trimethylbenzene	1.7%

^a Information taken from MSDS's unless otherwise specified. No hazardous inert ingredients are listed on the MSDSs for powder and pellet formulations.

Potassium Permanganate Toxicity. The neutralization of rotenone would involve the use of potassium permanganate (KMnO₄). Potassium permanganate salt, also known as “permanganate of potash,” is a strong oxidizing agent used in many industries and laboratories. It is also used as a disinfectant, especially in the treatment process of potable water. It has been used effectively as a neutralizing compound for rotenone treatments for many years (USEPA 2006).

Environmental Consequences.

Proposed Action. Under the Proposed Action, rotenone formulations would be applied to target waters. Liquid rotenone containing associated dispersants and emulsifiers would be dispensed into target flowing waters to remove fish populations.

Liquid piscicide formulations of rotenone including CFT Legumine contain inerts, adjuvants, metabolites, impurities, and contaminants in addition to the active ingredient rotenone. SERA (2008) examined the potential negative effects of these compounds on humans and concluded that metabolites, a breakdown product of rotenone, did not increase the risk of human health effects associated with the use of rotenone formulations. Similarly, it was concluded that available data indicate the inerts are not present in amounts that would increase the risks associated with the proposed formulations. The limited impact of impurities, such as degeulin and the “other associated resins” are identified in SERA (2008). These non-active ingredients are not discussed further.

Potential for Public Exposure. The HHERA describes several ways humans may be exposed to rotenone. The highest potential exposure would be to workers from the preparation and application of rotenone. Dermal and inhalation exposure would be the primary routes of exposure for applicators. Oral exposure of humans to rotenone could occur from ingestion of water while swimming, ingestion of treated fish or other organisms. Human exposure could theoretically also result from ingestion of crops that have been irrigated with rotenone-treated water or ingestion of water where rotenone reaches a potable water intake. However, label directions dictate that treated fish not be used as food or feed, and that no use of rotenone should occur within ½ mile (upstream in rivers or streams) of irrigation or potable water intakes. Furthermore, U.S. EPA recommended mitigations to greatly reduce or eliminate exposure to the general public include restricting access for members of the general public to treated areas and the use of potassium permanganate to ensure rotenone is neutralized before it leaves the project area. Applying these mitigation measures would greatly reduce the potential for public exposure to rotenone.

The intended use of rotenone is as a piscicide, a chemical used to remove fish from target waters. The potential effects of rotenone to other groups of animals, including humans when used as a piscicide are discussed here. Rotenone is somewhat selective in context of an aquatic application in that most species of fish are more sensitive to rotenone than are most species of aquatic invertebrates. For humans, there are basically two groups that have the potential to be exposed to rotenone: crews conducting activities associated with the Proposed Action and the general public.

The review of rotenone uses and potential risks associated with these uses completed by the U.S. EPA provides some recommended mitigation measures to reduce risk (SERA 2008). These mitigations include:

- Lowering the maximum application rate from 250 ppb to 200 ppb;
- The use of effective personal protective equipment by workers;
- Restricted access for members of the general public to treated areas;
- The use of potassium permanganate to detoxify rotenone.

Assuming that these recommendations are implemented, the risks associated with the use of rotenone should be minimal. At application rates of the Proposed Action i.e., 50 – 150 ppb, hazard quotients for workers do not exceed the level of concern. As a result of the implementation of the above mitigation measures, members of the general public would not be exposed to significant levels of rotenone.

Human Health Risk Assessment. Concern has been expressed over the potential for exposure to rotenone to cause Parkinson's disease. It is clear that rotenone is neurotoxic, and therefore this is of concern. However, most studies demonstrating that rotenone can induce effects similar to those of Parkinson's disease were conducted using routes of exposure that are not directly relevant to potential human exposures (e.g., intraperitoneal or intravenous injection, direct installation into the brain, and consumption of large volumes of treated water). Additionally, these routes of exposure are not relevant to potential routes of exposure to rotenone that may occur during fisheries treatment projects. For applicators of rotenone during a treatment project, the use of required PPE would significantly reduce, if not eliminate, exposure (Finlayson et al. 2010). For the general public, restricting access to the treatment area until rotenone concentrations degrade to < 40 ppb (as determined by demonstrating the survival of sentinel fish following a 24-hour bioassay) and the use of potassium permanganate to neutralize water leaving the treatment area would greatly minimize the potential for exposure (Finlayson et al. 2012, USEPA 2007).

In addition to the active ingredient rotenone, all liquid formulations contain petroleum solvents, which are complex mixtures. These petroleum solvents do not appear to be present in amounts that are toxicologically substantial relative to rotenone and other related compounds (SERA 2008). Following the recommended mitigations of the U.S. EPA Reregistration Eligibility Decision (RED) for rotenone (of restricting access of the general public to the treatment area and using potassium permanganate to ensure rotenone would not affect areas beyond the treatment area) would result in no or minimal exposure to the general public. Because of this, the risk characterization for human health effects is relatively simple and focuses on risks to workers from dispersing rotenone and other associated activities of the Proposed Action. The recent RED prepared by the U.S. EPA's Office of Pesticide Programs requires that workers involved in application of rotenone use proper personal protective equipment (PPE). If the specified required PPE are properly used, only maximum application rate exceeds the level of concern (SERA 2008). The level of concern is also exceeded when effective PPE is not used and when there is an accidental exposure. Accidental exposures are included in all Forest Service risk assessments and BLM Risk Management Worksheets to evaluate the proper handling of pesticides. Aggressive steps are warranted in the event of accidental exposures or mishandling of rotenone. Where exposure risks to BLM employees would exceed what is allowable (e.g. use of full face respirators for mixers and handlers) BLM employees would not assist with these components of a given treatment project. Otherwise, where risks are within acceptable limits and can be effectively mitigated with PPE and protocols, BLM personnel may be able to provide limited assistance under the guidance of certified CPW applicators.

The U.S. EPA recommends the use of potassium permanganate to detoxify water treated with

rotenone. If properly applied, potassium permanganate should not present any additional risk and should decrease risks associated with the use of rotenone as a piscicide. If improperly applied (i.e., applied in excess) the reduction in risk due to the neutralization of rotenone should outweigh risks associated with the use of potassium permanganate SERA (2008).

Conclusion. Potential impacts to human and ecological health from exposure to rotenone have been recently reviewed by both the EPA during the re-registration process for rotenone use and by the Forest Service in relationship to the use of rotenone as a piscicide (EPA 2006, EPA 2007, and SERA 2008). While rotenone and potassium permanganate have been shown to have potential impacts to human health, the concentrations to be used, duration of application, and potential exposure routes from the Proposed Action limit the potential for human health impacts. Additionally, neutralizing rotenone with potassium permanganate, informing the public of treatment timing and location, and asking that publics avoid access to the treatment area would further mitigate potential human health risks through reducing the risk of chemical exposure.

No Action Alternative. Under the No Action alternative, no authorization to release chemicals on BLM managed lands would be completed at the programmatic level. No impacts to human health and safety would be anticipated.

CUMULATIVE IMPACTS SUMMARY

Numerous activities are occurring across Colorado. Within stream corridors across the state, various recreation activities, livestock grazing, mining, irrigation, agricultural practices, oil and gas development, housing and commercial developments, municipal water use, along with a variety of other uses are occurring. These activities are reasonably certain to continue to occur and are likely to increase in some areas in the foreseeable future.

The proposed action involves very limited disturbance or impact, and impacts would be short-term (generally less than a few months). Ground disturbance in the form of the notching of beaver dams would mimic natural disturbance associated with high flow events. Beaver dams are not considered permanent fixtures on the landscape and routinely come and go in relation to beaver occupation and periodic high flow events.

Given the very limited, site specific, and short duration effects associated with chemical treatments as proposed, there would be no cumulative impacts anticipated to any resources. The proposed action would authorize chemical removal of target fish, have short-term impacts to some life stages of aquatic insects, early life stages of some amphibian species, and short-term effects on water quality in short, discrete stream segments. No long-term environmental effects or cumulative effects are anticipated from the proposed action when added to other actions already occurring and expected to continue to occur within watersheds across the state of Colorado.

PERSONS/AGENCIES CONSULTED

1. Colorado Parks & Wildlife – Senior Aquatic Biologists, Fisheries Chief
2. U. S. Fish & Wildlife Service – Creed Clayton

INTERDISCIPLINARY REVIEW

The following BLM personnel reviewed and/or contributed to this environmental assessment:

NAME	TITLE	AREA OF RESPONSIBILITY
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Tom Fresques	Fish Biologist	NEPA Lead
Erin Jones	District NEPA Coordinator	Document Formatting, E-planning
Desa Ausmus	Wildlife Biologist	Review of Wildlife, Migratory Birds
Judy Perkins	Botanist	Review of Vegetation, Weeds/Invasive Species
Keith Sauter	Hydrologist	Review of Soils, Water Quality, Hydrology
Matthew Ringer	Safety Specialist	Review of Human Health and Safety
<i>Southwest District</i>		
Ken Holsinger	Natural Resource Specialist	Writing and review of Vegetation related sections
Jedd Sondergard	Hydrologist	Review of Soils, Water Quality, Hydrology
Russ Japuntich	Fish Biologist	Review of Various Sections
<i>Front Range District</i>		
Dave Gilbert	Fish Biologist	Review of Various Sections

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Appendix A
BLM Colorado Sensitive Species List, 2015
 (Click below to view entire list)

Common Name	Scientific Name	Designation of other agencies: CNHP Global and State Ranking: G / S ; Forest Service Sensitive: FS; Colorado Parks and Wildlife: SGCN Tier , and State Listed S .	Occurrence in BLM Districts/ Field Offices/NLCS Units					
			Northwest Dist.		Southwest Dist.		Front Range Dist.	
			FO	NLCS	FO	NLCS	FO	NLCS
MAMMALS								
Townsend's big-eared bat	<i>Corynorhinus townsendii pallescens</i>	G3G4T3T4/S2, FS, SGCN Tier 1, SC	GJ, CRV, WR	DENCA, MCNCA	TR, UN	CANM, DENCA, GGNCA	SLV, RG	BC
Gunnison's prairie dog	<i>Cynomys gunnisoni</i>	G5/S5, FS, SGCN Tier 1			GN, TR, UN		SLV, RG	BC
White-tailed prairie dog	<i>Cynomys leucurus</i>	G4/S4, FS, SGCN Tier 1	GJ, K, LS, WR	DENCA	UN	DENCA, GGNCA		
Black-tailed prairie dog	<i>Cynomys ludovicianus</i>	G4/S3, FS, SGCN Tier 1, SC					RG	
Spotted bat	<i>Euderma maculatum</i>	G4/S2, FS, SGCN Tier 1	CRV, GJ, LS, WR	DENCA	TR, UN	CANM, DENCA, GGNCA	SLV	
Allen's (Mexican) big-eared bat	<i>Idionycteris phyllotis</i>	G4/S2S3, FS, SGCN Tier 2			TR, UN	CANM	SLV	
Fringed myotis	<i>Myotis thysanodes</i>	G4/S3, FS, SGCN Tier 1	GJ, CRV, WR	DENCA	TR, UN	CANM, DENCA, GGNCA	RG, SLV	BC
Rocky mountain bighorn sheep	<i>Ovis canadensis</i>	G4S4, SGCN Tier 2	K, GJ, CRV		UN, GU, TR	GGNCA	SLV, RG	BC
Desert bighorn sheep	<i>Ovis canadensis nelsoni</i>	G4T4; FS, SGCN Tier 2	GJ	DENCA, MCNCA	TR, UN	DENCA,		
Kit fox	<i>Vulpes macrotis</i>	G4/S1, FS, SGCN Tier 1, SE	GJ	DENCA, MCNCA	UN	DENCA, GGNCA		
Swift fox	<i>Vulpes velox</i>	G3/S3, FS, SGCN Tier 1, SC					RG, SLV	
BIRDS								

This Attachment is not Section 508 compliant.
 Please contact Carol Dawson for information and access if needed.

Attachment 1
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UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
COLORADO RIVER VALLEY FIELD OFFICE
SILT, COLORADO

FINDING OF NO SIGNIFICANT IMPACT
FOR
DOI-BLM-N040-2014-0062-EA

I have reviewed the direct, indirect and cumulative effects of the proposed action documented in the EA referenced above. The effects of the proposed action are disclosed in the Alternatives and Environmental Effects sections of the EA. Implementing regulations for NEPA (40 CFR 1508.27) provide criteria for determining the significance of the effects. Significant, as used in NEPA, requires consideration of both *context* and *intensity* as follows:

1. Impacts that may be both beneficial and/or adverse.

Impacts associated with issuing a Pesticide Use Permit to Colorado Parks & Wildlife to conduct a fish eradication effort are identified and discussed in the Affected Environment and Environmental Effects sections of the EA. The proposed action would not have any significant beneficial or adverse impacts on the resources identified and described in the EA.

2. The degree to which the proposed action affects health or safety.

The proposed activities would not significantly affect public health or safety. The purpose of the proposed action is to authorize stream reclamation and removal of nonnative fishes. This would improve conditions and move select stream reaches to meeting Colorado Public Land Health Standards. Similar actions which have been conducted across Colorado and throughout the country have not significantly affected public health or safety.

3. Unique characteristics of the geographic area such as prime and unique farmlands, caves, wild and scenic rivers, wilderness study areas, or ACECs.

Select treatment reaches could be located within waters identified as eligible or suitable for inclusion into the National Wild and Scenic Rivers System under the Wild and Scenic Rivers Act. It is also possible that treatment reaches could be located within wilderness study areas or ACECs. Through design features and mitigation measures, impacts to these areas would be negligible.

4. The degree to which the effects are likely to be highly controversial.

The possible effects of proposed action are limited to target fish species, some aquatic invertebrates, beaver, and limited riparian vegetation. The project's effects are not likely to be highly controversial.

5. The degree to which the effects are highly uncertain or involve unique or unknown risks.

The possible effects on the human environment are not highly uncertain nor do they involve unique or uncertain risks. The technical analyses conducted for the determination of the impacts to the resources are supportable with use of accepted techniques, reliable scientific data, and professional judgment. There are no highly uncertain, unique, or unknown risks.

6. The degree to which the action may establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration.

This proposed action would facilitate the future State action of restocking the treated stream reach with native pure cutthroat trout. Depending on the lineage of cutthroat trout to be stocked, some additional implications could result. Green Lineage cutthroat trout, which are believed to be the native cutthroat of the Colorado River drainage, are currently treated as a federally threatened species via a U. S. Fish & Wildlife Service (FWS) position paper. If this lineage were stocked, there could be some implications associated with the ESA on land use activities that affect the species. Actions that may affect the species may require completion of Section 7 consultation. In summary, the resulting effects to land use activities are unknown at this time until FWS evaluates all identified cutthroat trout in Colorado and determines that the species, subspecies, or distinct population segments warrant listing or a change in listing status. A new position paper clarifying the status of green lineage cutthroat trout west of the Continental Divide is expected in 2015.

7. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts.

The proposed action would create negligible landscape-level cumulative impacts when viewed in conjunction with those activities currently occurring and reasonably certain to occur on adjacent private/other lands.

8. The degree to which the action may adversely affect scientific, cultural, or historical resources, including those listed in or eligible for listing in the National Register of Historic Places.

The potential for historic properties near the stream reaches is low.

9. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.

The proposed action has no potential to adversely affect any endangered or threatened species or their habitat based on effects analysis in the EA.

10. Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

The proposed action does not violate or threaten to violate any Federal, State, or local law or requirements imposed for the protection of the environment.

Based upon the review of the test for significance and the environmental analyses conducted with proposed mitigation, I have determined that the actions analyzed in the EA would not significantly affect the quality of the human environment. Accordingly, I have determined that the preparation of an Environmental Impact Statement is not necessary for this proposal.



Joseph F. Meyer
Northwest Colorado District Manager

4-11-16

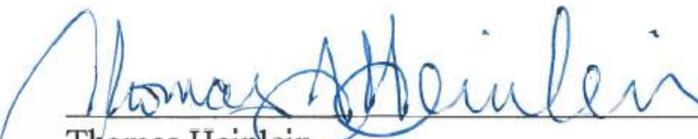
Date



Barbara Sharrow
Southwest Colorado District Manager
(Acting)

3-30-16

Date



Thomas Heinlein
Front Range District Manager

3-17-16

Date
