UTAH RECLAMATION
MITIGATION
AND CONSERVATION
COMMISSION

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COMMISSIONERS
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Don A. Christiansen
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July 31, 2006

Dear Interested Party:

Enclosed is a copy of the Record of Decision and Finding of No Significant Impact (FONSI) and the Final Environmental Assessment (EA) for the Rotenone Treatments in the Willow Creek Drainage, Grand and Uintah Counties, Utah. The Mitigation Commission has made the decision to proceed with the Proposed Action, implementation of the chemical treatment and removal of brook trout, non-native cutthroat trout and cutthroat/rainbow hybrid trout in the Willow Creek Drainage, Grand and Uintah Counties, Utah.

The Proposed Action and a No Action alternative were evaluated in the EA. Under the Proposed Action, non-native trout will be removed from the Willow Creek drainage by treatment with rotenone. Prior collections of existing native fish, speckled dace and mountain suckers will be made by electro-fishing and restocked after treatment for population maintenance. Colorado River cutthroat trout will be stocked when the drainage is deemed clear of non-native trout.

Thank you for your interest and comments. If you have any questions, please contact Maureen Wilson at the above address and phone number. The FONSI and EA may also be viewed through the Mitigation Commission's website: www.mitigationcommission.gov.

Sincerely,

Michael C. Weland
Executive Director

enclosures

DECISION NOTICE AND FINDING OF NO SIGNIFICANT IMPACT FOR ROTENONE TREATMENTS IN THE WILLOW CREEK DRAINAGE, GRAND AND UINTAH COUNTIES, UTAH

AND

FINAL ENVIRONMENTAL ASSESSMENT OF ROTENONE TREATMENTS IN THE WILLOW CREEK DRAINAGE, GRAND AND UINTAH COUNTIES, UTAH.

UTAH RECLAMATION MITIGATION AND CONSERVATION COMMISSION

July 28, 2006

DECISION NOTICE
and
FINDING OF NO SIGNIFICANT IMPACT
for
Rotenone Treatments in the Willow Creek Drainage, Grand and Uintah Counties, Utah

Utah Reclamation Mitigation and Conservation Commission

BACKGROUND AND PUBLIC INVOLVEMENT

The Utah Reclamation Mitigation and Conservation Commission (Mitigation Commission) and the Utah Division of Wildlife Resources (Division) have jointly prepared an Environmental Assessment (EA) to determine the effects of rotenone treatments in the Willow Creek drainage to remove nonnative trout species and reestablish Colorado River cutthroat trout populations. The Draft EA was prepared with public input encouraged by a scoping notice and agency coordination. It was then distributed for review to 38 organizations and individuals. This public involvement process generated additional comments which are reflected in the Final EA.

DECISION

After analyzing the environmental effects, it is my decision to select the Proposed Action for implementation. This action entails the Mitigation Commission and the Division cooperating to implement the chemical treatment and removal of brook trout, non-native cutthroat trout and cutthroat/rainbow hybrid trout in the West Willow Creek Drainage followed by introduction of Colorado River cutthroat trout. The Proposed Action provides for:

Brook trout, non-native cutthroat trout, and cutthroat/rainbow hybrid trout will be removed from the Willow Creek drainage by treatment with rotenone. Existing native fish (speckled dace and mountain sucker) will be collected prior to the treatment by electro-fishing, and restocked to the stream after treatment to facilitate their population maintenance. Colorado River cutthroat trout will be stocked when the drainage is deemed clear of non-native fishes. It is expected that two or three rotenone treatments (over consecutive years) may be needed to effectively remove unwanted trout species.

REASON FOR THE DECISION

Colorado River cutthroat trout (cutthroat trout) are the only trout species native to tributaries of the Green River in the Uinta Basin. These cutthroat trout presently exist within fragmented components of their historic range. Their decline is attributed to loss of habitat, interspecific competition from non-native fishes (i.e. brook or rainbow trout), and loss of genetic purity from hybridization with rainbow and other subspecies of cutthroat trout.

In the northeast region of Utah, remnant populations of cutthroat trout are located on both the south and north slopes of the Uinta Mountain range and the North Tavaputs Plateau. The Conservation Agreement and Strategy for Colorado River Cutthroat Trout in the State of Utah identifies Willow Creek for cutthroat trout management.

Meeting the Purpose and Need

The removal of non-native trout species is required in order to re-introduce cutthroat trout to their native habitats and to meet conservation objectives for the cutthroat trout. The EA analyzed two alternatives: the Proposed Action, and the No Action Alternative. Under the Proposed Action, removal of nonnative trout in Willow Creek will result in approximately 28 miles of stream habitat for cutthroat trout reintroduction.

Addressing the Issues The Proposed Action was selected over the No Action because it best met the needs and purposes, and best addressed the following issues:

- *Wetlands*

No long-term impacts to wetlands or riparian areas are anticipated. Trampling of vegetation will most likely occur during treatments but this effect is considered short term and insignificant.

- *Water Quality*

This concern was expressed for potential impacts of the Proposed Action to stream water quality within the stream treatment area and the potential violation of federal and state water quality regulations.

Under the Proposed Action, short term toxicity to aquatic organisms sensitive to rotenone will occur. No long-term impacts are anticipated. No effects to designated beneficial uses under the State of Utah water quality regulations are anticipated. The fish toxicant *rotenone* will be applied according to federally-approved label directions.

- *Fisheries and Wildlife*

The Proposed Action allows the reintroduction and range reoccupation of the cutthroat trout and contributes to the long-term persistence of the species. Native fish species already in the affected stream reaches will be removed, held during the treatment and restocked after the treatment is completed to maintain these populations. No changes in recreational use of the fishery are expected.

No direct effects are anticipated to wildlife located in the project area. No long term indirect effects are anticipated.

- *Threatened, endangered and State sensitive species*

No impacts to threatened or endangered species are anticipated. Cutthroat trout is a state sensitive species and the Proposed Action will increase their distribution and abundance and contribute to their long-term persistence.

- *Public health and safety*

The Proposed Action includes safety measures to minimize any non-lethal potential effects of rotenone on individuals using it. No impacts are anticipated.

- *Consistency with plans and policies*

The Proposed Action is not inconsistent with the Uintah County Public Lands Policy, Grand County policies, the U.S. Bureau of Management Resource Management Plan, the Division of Wildlife Resources Strategic Plan for the Comprehensive Management of Utah Wildlife Resources and the Colorado River Cutthroat Trout Conservation Agreement and Strategy. No changes in the sport fishery and land management by the Division in the project area are anticipated with the Proposed Action.

PUBLIC INVOLVEMENT

The Commission and Division conducted formal scoping in December, 2005 to determine the relevant issues and the scope of analysis to be incorporated in the EA. The EA underwent a 30-day review period, from June 23, 2005 through July 25, 2006. The draft document was sent directly to 38 Federal, State and Tribal agencies, local governments, organizations, irrigation companies, and universities. In response to the public review period, the Commission and Division received one letter commenting on the EA, from the Uintah County Commission. The Final EA has been modified to respond to their comments.

This Decision Notice and FONSI, will be sent to all respondents, as well as all interested parties, Federal, Tribal, State, and local agencies that received the Draft EA.

FINDING OF NO SIGNIFICANT IMPACT

Based on information contained in the EA and supporting documentation, a Finding of No Significant Impact (FONSI) is made on this action in compliance with the provisions of Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands). This action would also not significantly affect the quality of the human environment, within the meaning of Section 102(2)(C) of the National Environment Policy Act, for the following reasons.

1. The environmental impacts of this action are not considered significant.

2. Public health and safety are minimally affected by this action.

3. Riparian vegetation may be impacted minimally and only on a short term basis. No wetlands will be affected.

4. None of the identified environmental effects are considered highly controversial.

5. None of the possible effects on the human environment are highly uncertain or involve unique or unknown risks.

6. The action sets no precedent or decision in principle about other actions which could pose significant environmental effects.

7. This action is related to the potential future action of additional rotenone treatments in the drainage. The impacts of such an action have been evaluated and are not significant.

8. No cultural resources have been identified that may be affected by the Proposed Action.

9. Consultation with the U.S. Fish and Wildlife Service on the presence of threatened or endangered species (for purposes of the Endangered Species Act) indicated that this action is not likely to affect threatened, endangered or candidate species or their designated critical habitats.

10. This action would not threaten any violations of applicable laws or requirements imposed for protection of the environment.

CONCLUSION

The Proposed Action does not constitute an action that normally requires preparation of an Environmental Impact Statement (EIS). The Proposed Action alternative will not have a significant effect on the human environment. Negative environmental impacts that could occur are negligible and can be generally eliminated with mitigation. There are no unmitigated adverse impacts on public health or safety, threatened or endangered species, sites or districts listed in or eligible for listing in the National Register of Historic Places, or other unique characteristics of the region. No highly uncertain or controversial impacts, unique or unknown risks, cumulative effects, or elements of precedence were identified that have not been mitigated. Implementation of the action will not violate any federal, state, or local environmental protection law.

Based on the foregoing, it has been determined that an EIS is not required for this project and thus will not be prepared.

IMPLEMENTATION

Rotenone treatments and subsequent restocking of native fishes identified in the Proposed Action will be implemented by the Commission in cooperation with the Division. Implementation of the project may occur upon signing this FONSI.

FURTHER INFORMATION

Please direct questions on the EA or FONSI to Maureen Wilson, Project Coordinator; Utah Reclamation Mitigation and Conservation Commission; 102 West 500 South, #315, Salt Lake City, Utah 84101 (Phone (801) 524-3146)

Approved: _____

Michael C. Weland, Executive Director
Utah Reclamation Mitigation and Conservation Commission

Date: 7/28/02

FINAL ENVIRONMENTAL ASSESSMENT OF ROTENONE TREATMENTS IN THE WILLOW CREEK DRAINAGE, GRAND AND UINTAH COUNTIES, UTAH.

Prepared for:

Utah Division of Wildlife Resources
1594 West North Temple, Suite 2110
Salt Lake City, Utah 84116

and

Utah Reclamation Mitigation and Conservation Commission
102 West 500 South #315
Salt Lake City, Utah 84101

Prepared by:

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July 2006

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CHAPTER 1: PURPOSE AND NEED

1.1 INTRODUCTION

The Environmental Assessment (EA) is organized as follows:

- Chapter 1 introduces the project, briefly describes the Proposed Action, discusses the purpose and need for this proposal, explains the NEPA process, identifies the decisions to be made based on this analysis, provides background information relevant to this proposal, discusses public involvement and identifies issues considered in preparation of the EA, and lists permits, licenses, and certifications required for implementation of the Proposed Action.
- Chapter 2 describes the Proposed Action and alternatives, including the required No-Action Alternative. Environmental effects of the Proposed Action and alternatives are briefly summarized in this chapter in a comparative format.
- Chapter 3 describes the affected environment, including a detailed description of each issue addressed in the EA, describing the natural and human environment associated with each issue.
- Chapter 4 identifies the anticipated environmental effects of implementing the Proposed Action and alternatives, mitigation measures, cumulative actions.
- Chapter 5 addresses how other state and federal regulations are being complied with in this EA.
- Chapter 6 identifies the individuals that prepared this EA.

1.2 PROPOSED ACTION

The Proposed Action, described in more detail in Chapter 2, includes the chemical removal of brook trout (*Salvelinus fontinalis*), non-native cutthroat trout and cutthroat/rainbow hybrid trout from the Willow Creek Drainage. Selected streams and stream sections in the drainage will be treated chemically with rotenone. Prior to rotenone treatments, existing native fish (i.e., speckled dace- *Rhinichthys osculus* and mountain sucker (*Catostomus platyrhynchus*) will be removed by electro-fishing. These species will be re-stocked after the treatment to facilitate their population maintenance. Colorado River cutthroat trout (CRCT; *Oncorhynchus clarki pleuriticus*) will be stocked when the drainage is deemed clear of non-native fish. The implementation of the Proposed Action involves two treatments that will be scheduled for the summer of 2006 and 2007.

1.3 DWR/BLM RESOURCE MANAGEMENT PLAN/ CONSERVATION AGREEMENTS AND COUNTY POLICY

Direction for resource management by the Utah Division of Wildlife Resources (UDWR) is provided by the Strategic Plan for the Comprehensive Management of Utah Wildlife Resources

(SPCMUWR). One of the plan goals is "to conserve and enhance populations of genetically unique special fish species within their historic habitats…" (UDWR 1992).

The conservation agreement and strategy for the CRCT in the State of Utah also provides management direction for state and federal management agencies. Signatories of this agreement include the Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service, Bureau of Reclamation, Utah Reclamation Mitigation and Conservation Commission (URMCC), and the Utah Department of Natural Resources (Lentsch and Converse 1997). The main goal of the CRCT management under this strategy is to conserve populations within significant portions of their historic range to ensure their continued existence, while encouraging the promotion of this species as a sportfish with the State of Utah. The Willow Creek drainage, located in the North Tavaputs Plateau, is part of the Northeastern Geographic Management Unit (GMU) for CRCT. Conservation objectives and actions for this drainage, including maintaining populations, eliminating or minimizing threats from non-native salmonids, and enhancing habitat, are identified in the conservation agreement and strategy for CRCT (Lentsch and Converse 1997).

The Proposed Action is not inconsistent with the Uintah County Public Lands Policy, Grand County policies or the BLM Resource Management Plan.

Most of the uplands in the project area are managed by the State Institutional Trust Land Administration (SITLA). Remaining lands are managed by the Ute Indian Tribe and the Division. The only portion of the project area located within Uintah County is that reach of Willow Creek from the confluence of Meadow Creek upstream to the Grand County border, a distance of approximately one mile. There are no plans to stock CRCT in the mainstem Willow Creek in either Grand or Uintah Counties. The introduction will only occur on State and Ute Tribal lands within Grand County. The only project activity scheduled within the boundary of Uintah County is the location of the detoxification station at the Meadow Creek confluence, some 6 miles distant from the proposed reintroduction sites.

The Division currently leases grazing rights in the project area from SITLA. These rights have not been exercised for some time. Several improvements have resulted since livestock grazing in the drainage has been minimized including: 1) increased vegetation in canyon bottoms, stream banks and side hills; 2) increased stream flow in small streams that had not flowed for years; 3) decreased stream bank erosion and silt loads; 4) enhanced water table and fish habitat from beaver dams, 5) improved streamside vegetation and decreased summer water temperatures; 6) increased trout in improved habitat areas along lower West Willow Creek, East Willow Creek and She Canyon.

1.4 DECISIONS TO BE MADE

The primary decision to be made is whether or not to approve the Proposed Action, in part or in its entirety, and if so under what terms and conditions. The Responsible Official may approve the Proposed Action or an alternative intact, as presented in this EA, or select an alternative that is a combination of elements of the Proposed Action and the No-Action Alternative. The Responsible Official must also decide either that the impacts of the selected alternative would be less than significant or that an EIS will be prepared.

1.5 PURPOSE AND NEED FOR ACTION

The purpose of the proposed action is to re-establish native trout populations in the Willow Creek Drainage, Grand and Uintah counties, Utah. There is a need to meet conservation objectives for CRCT by eliminating or minimizing threats from non-native salmonids and establishing new CRCT populations in this drainage. Eliminating non-native trout is necessary to prevent competition, predation, and/or hybridization with native CRCT. The target species for the fish eradication portion of the project are rainbow trout, brook trout, and hybridized cutthroat trout (all non-native salmonids). Streams that will be treated include Steer Gulch, Clear, Corral, Pioche, and West Willow creeks. The goal "to conserve and enhance populations of genetically unique special fish species within their historic habitats…" included in the Strategic Plan for the Comprehensive Management of Utah's Wildlife Resources (SPCMUWR; UDWR 1992) applies to all streams in the Willow Creek drainage. Further, Willow Creek is one of the drainages identified in the Conservation Agreement and Strategy for CRCT. Establishing CRCT in West Willow Creek (among other streams) was one of the potential solutions for the lack of native fish in the drainage identified in the Aquatic Management Plan for Willow Creek (Crosby and Bartlett 2000).

1.6 PUBLIC INVOLVEMENT

1.6.1 SCOPING AND ISSUE IDENTIFICATION

The purpose of scoping is to solicit agency and public input on the issues and concerns regarding the proposed project and the methods identified to avoid or minimize adverse impacts (i.e., alternatives and mitigation measures).

On January 3, 2006, the UDWR and the URMCC mailed scoping notices to 105 agencies, organizations, or individuals on their mailing list. A list of the agencies and persons consulted is included in the appendix. The scoping document provided project background information, a brief description of the Proposed Action, and the method for providing comments.

As a result of these scoping activities, comment letters from two agencies (U.S Bureau of Reclamation and US Fish and Wildlife Service) and one individual were received. Nine issues were raised based on the scoping process, input received during similar projects in the past, and the internal review conducted by UDWR personnel. No significant issues were raised by public comments. Significant issues raised by agencies were similar to those identified through the UDWR internal review.

1.6.1.1 Issues Identified During Scoping

1.6.1.1.1 Farmlands, Wetlands, and Riparian Habitats

The implementation of the proposed action could adversely affect wetlands and riparian vegetation in the project area.

1.6.1.1.2 Water Quality

The treatment of streams with rotenone could result in alteration of water quality and violate federal or state water quality regulations.

1.6.1.1.3 Fisheries

The use of rotenone could adversely affect the diversity and abundance of non-target fish species.

1.6.1.1.4 Wildlife

The use of rotenone could adversely affect wildlife including amphibians, insects, birds, and game animals.

1.6.1.1.5 Threatened and Endangered species

The Proposed Action could adversely affect threatened and/or endangered species.

1.6.1.1.6 State Sensitive Species

The Proposed Action could adversely affect unique, rare, and sensitive species.

1.6.1.1.7 Air Quality

The implementation of the Proposed Action could create objectionable odors.

1.6.1.1.8 Recreation

Introductions of native trout under the Proposed Action could lead to problems with trespass and vandalism on tribal and private lands. The Proposed Action could also alter the quality or quantity of recreation/tourism opportunities.

1.6.1.1.9 Public Health and Safety

The Proposed Action could create a human health hazard or potential human hazard and a risk of release of hazardous substances.

1.6.1.2 Issues Analyzed in Detail

Seven of the nine issues identified will be analyzed in detail in the following sections. Two issues, air quality and recreation, will not be analyzed. These issues have been raised for rotenone treatments in other bodies of water in Utah and other states. UDWR and URMCC personnel agreed that these issues were not of concern for the Willow Creek project.

The use of liquid-formulated rotenone contains solvents that make it soluble in water. These solvents emanate smells that may last for several hours to several days. The duration of such smells depend on air and water temperatures and wind direction. The aromatic solvents are relatively dense organic compounds that tend to remain close to the ground and move downwind. The California Department of Pesticide Regulation found no health effects from these odors (Finlayson et al. 2000). Odors associated with the application of rotenone would dissipate in a short time period (within days of the treatment) and the completion of the treatment would not lead to impacts to the air-shed. The project area is also quite remote which would limit any potential impact to the human environment.

Further, given the remote location of the streams that will be treated and the limitations to their access, it is unlikely that impacts on recreational activities or access to Tribal lands would occur. Fisheries resources and sport fishing opportunities in the Willow Creek Drainage are very limited due to the lack of sufficient habitat waters. Recreational fishing occurs in the Towave and Weaver Reservoirs. These reservoirs are in the Willow Creek drainage but are not part of the West Willow drainage. Significant fishing in the area is limited to these reservoirs. These fisheries are controlled by the Tribe with assistance from the US Fish and Wildlife Service. In addition, visitation to the drainage is considered very light. The Willow Creek Drainage is unpopulated with exception of a few seasonal or year-round ranch workers. Ouray, a small Native American

Settlement is located a few miles above the confluence of Willow Creek with the Green River. Several other small communities are located northeast and northwest of the drainage. All of the mainstem of Hill Creek flows through Tribal administered lands and access to this area as well as to the southwest portion of Willow Creek is restricted for non-tribal members (Figure 1, Crosby and Bartlett 2000).

1.6.2 CONSULTATION AND COORDINATION

Formal comment on proposed actions addressed in an EA is required by the Appeals Reform Act and is consistent with NEPA's requirements for public involvement. Substantive comments provide meaningful and useful information about concerns and issues and can be used to enhance project analysis and decision making.

As stated above, a scoping notice was distributed to local government, Tribal entities, State and Federal agencies, and the interested publics informing them of the upcoming preparation of an EA for the rotenone treatment of selected streams in the Willow Creek Drainage. Comments and concerns pertinent to the Proposed Action were solicited from those recipients.

Hard copies of the Draft EA were sent to all agencies and individuals who provided written comments in response to the original scoping notice. Selected entities who may have specific interest in this project, but who did not provide scoping comments, also received a hard copy of the draft. All recipients of the initial scoping solicitation received notification that a downloadable electronic version of the document could be found on the URMCC's website.

1.7 FEDERAL PERMITS, LICENSES NECESSARY TO IMPLEMENT THE PROJECT

This EA is intended to provide analysis to facilitate decisions to be made by the UDWR, URMCC, and other agencies with regulatory or permitting authority over the implementation of projects in the Willow Creek Drainage. The UDWR and URMCC decision will apply only to lands administered by the State Institutional Trust Land Administration (SITLA), the Ute Indian Tribe, and the UDWR. However, potential effects resulting from implementation of the Proposed Action and alternatives on lands, resources, and activities administered by other Federal, State, and local jurisdictions are also disclosed in this document.

Table 1 identifies other agencies' permits, licenses, and certifications that may be required for the implementation of the Proposed Action. This list is not exhaustive and other permits and approvals may be required.

Table 1. Other permits, licenses, and certifications that may be required.

Agency	Type of Action	Description of Permit or Activity
U.S. Fish and Wildlife Service	Section 7 consultation.	Biological Opinion or concurrence letter required for actions by Federal agencies that could affect species listed under the Endangered Species Act.
State Historic Preservation Office	Section 106 consultation.	Concurrence letter required for agency actions that could affect cultural resources protected under the National Historic Preservation Act.

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CHAPTER 2: ALTERNATIVES

2.1 INTRODUCTION

Chapter 2 is intended to present the Proposed Action and alternatives in comparative form, sharply defining the issues and providing a clear basis for choice among options by the responsible official and the public (40 CFR 1502.14). This chapter includes a discussion of how the Proposed Action and alternatives were developed, a detailed description of the Proposed Action and alternatives, a list of mitigation measures identified and assessed in the analysis, a description of the cumulative actions addressed in this analysis, and a comparison of the Proposed Action and alternatives highlighting their differences in terms of the issues outlined in Chapter 1.

2.2 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

2.2.1 PROPOSED ACTION

The Utah Division of Wildlife Resources proposes to treat streams in the Willow Creek Drainage (Figure 1) with the fish toxicant rotenone to remove brook trout, non-native cutthroat trout and cutthroat/rainbow hybrids. Existing native fish, speckled dace and mountain suckers will be salvaged prior to the treatment through electro-fishing. No fish were located in East Willow Creek, Little Creek, She Canyon, and that portion of Willow Creek from the confluence of East and West Willow downstream to the confluence of Meadow Creek, approximately 1 mile into Uintah County. Stream habitats were severely degraded and inadequate to sustain fish in these reaches. There have never been fish collected from the 1-mile reach of mainstem Willow Creek located in Uintah County during previous sampling, nor is there any expectation that this reach will be able to support viable numbers of CRCT or any other trout species in the future, with or without the project. Salvaged fish will be restocked to the stream after treatment to facilitate their population maintenance. Colorado River cutthroat trout will be stocked after the drainage is deemed free of non-native salmonids. It is expected that two or three rotenone treatments (over two consecutive years) may be needed to effectively remove all unwanted trout species. The streams managed by the Division to be treated in the project area that now support other trout species, will be managed as sportfish populations and continue to provide recreational opportunities with no change in current harvest, season, and gear regulations.

Rotenone is a naturally occurring substance derived from the roots of tropical plants in the bean family (e.g., jewel vine- *Derris spp* and lacepod- *Lonchocarpus spp*). Rotenone has been used by native people to capture fish for foods in areas where these plants occur. This substance has been used widely in fisheries management in North America since the 1930s. It has also been used as a natural insecticide for gardening and to control parasites on domestic livestock.

Colorado River cutthroat trout are the only trout species native to tributaries of the Green River in the Uintah Basin. In the northeast region of Utah, populations of "pure" CRCT are located on both the south and north slopes of the Uintah Mountain range and the North Tavaputs Plateau. Historically, CRCT were distributed in all suitable waters of the basin (Behnke 1992). However, CRCT populations have declined drastically throughout their historic range due to loss of habitat,

interspecific competition with non-native fishes (i.e. brook or rainbow trout), and loss of genetic purity from hybridization with rainbow and other subspecies of cutthroat trout (Lentsch and Converse1997). In the State of Utah CRCT is considered a "species of special concern" (UDWR 2006). In 2000, CRCT were petitioned for listing as a threatened species under the Endangered Species Act (Greenwald 2000). In April 2004, the U.S. Fish and Wildlife Service ruled listing CRCT for ESA protection was not warranted (USFWS 2004) largely due to the existing conservation efforts of state and federal agencies. This species is currently managed under a Conservation Agreement and Strategy for CRCT in the State of Utah (Lentch and Converse 1997). Willow Creek was identified in this conservation agreement for CRCT management.

Recent surveys indicated only the West Willow arm is currently suitable for CRCT restoration. Streams in this arm include Steer Gulch, Clear, Corral, Pioche, and West Willow creeks. These streams were the only streams where non-native fish were found during the 2004 surveys (UDWR unpublished data). Treatment of these streams to remove nonnative trout would provide approximately 28 miles of stream habitat for CRCT. As streams in East Willow Creek (i.e., She Canyon, Little Creek and East Willow Creek) recover from a recent wild fire, approximately 38 additional stream miles will be available for CRCT restoration (Table 2). Steer Gulch, Corral Creek, Clear Creek, Pioche Creek, and the upper mile of West Willow Creek are located on Tribal lands, therefore involvement of the Ute Indian Tribe is crucial to treatment success. The Ute Tribe has given their approval of the project by resolution 05-334 dated November, 16 2005.

Table 2. Streams within the Willow Creek Drainage, Grand and Uintah counties, Utah.

Stream	Water ID	Main stem Length (miles)	Restoration Length (miles)	Treatment length (miles)
Bogart Canyon	II BB 060A 05 01	1.7	0.0	0.0
Buck Canyon	II BB 060A 04 01	1.7	0.0	0.0
Clear Creek	II BB 050C 01	3.3	0.8	0.8
Corral Creek	II BB 050E 01	2.1	2.1	2.1
Fish Creek	II BB 060A 01 01	5.4	2.4	0.0
Fish Creek, Left Fork	II BB 060A 01B 01	1.4	0.0	0.0
Fish Creek, Right Fork	II BB 060A 01A 01	2.4	0.0	0.0
Kelly Canyon	II BB 030C 01	8.9	0.0	0.0
Little Creek		7.1	7.1	0.0
Meadow Creek	II BB030 01-02	15.2	5.2	0.0
Pioche Creek [1]	II BC 01	16.0	14.0	2.0
She Canyon Creek	II BB 060A 01	12.3	11.2	0.0
Steer Gulch	II BB 050F 01	3.1	3.1	3.1
East Willow Creek	II BB 060 01	16.4	0.0	0.0
West Willow Creek	II BB 050 01	20.0	20.0	20.0
Total treatment length (miles)				**28**

Highlighted rows indicate streams that will be treated with rotenone.
[1] Treatment in this stream will only occur 2 miles upstream from the confluence with Willow Creek.

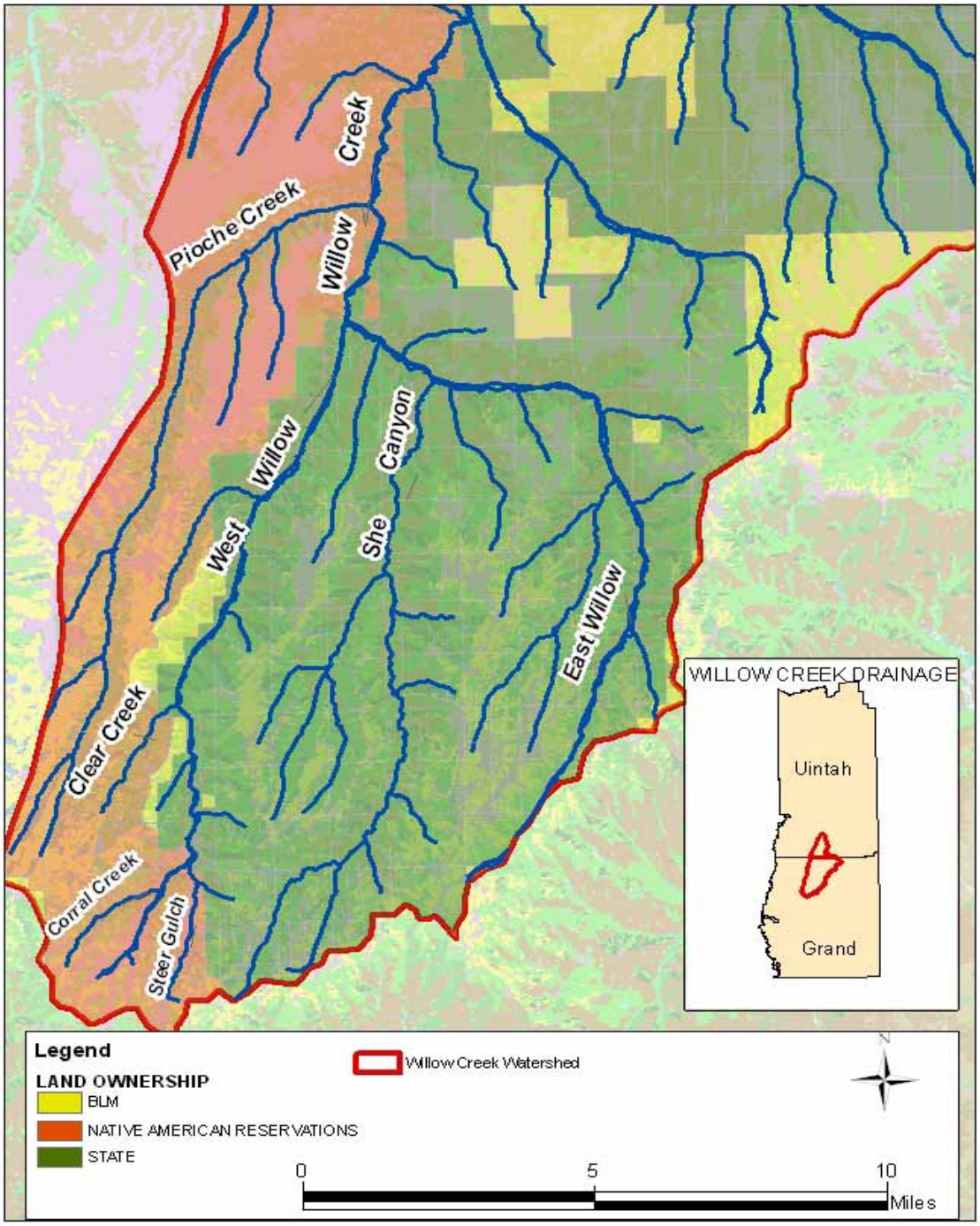

Figure 1. Map of Willow Creek Drainage.

A major physical component of Pioche Creek, Steer Gulch and West Willow is the presence of beaver dams. These streams will be flown by helicopter approximately two weeks before the treatment to assess the number and location of dams present. Beaver dams will be breached using dynamite by crews qualified in explosive use. Breaching these dams will prevent pooling, allow the free flow of rotenone through the treated streams, and reduce the availability of hiding places for fish during treatment.

The selected streams in the Willow Creek Drainage will be treated with liquid emulsifiable rotenone (Noxfish, 5% Active Ingredient, EPA Registration No. 655-172; or Prenfish, 5% Active Ingredient; EPA Registration No. 655-422). Rotenone will be applied at a rate of 3.0 parts per million (3 ppm is the equivalent of 3 mg/L) from drip station located at two mile intervals for a 6 hour period (Table 3). Springs and backwaters that may not be effectively treated by drip station will be treated using pressurized backpack sprayers. A small amount of sand and gelatin mixed with powdered rotenone (7.5 % Active Ingredients) may be used to create chemical dams to prevent fish from escaping into small side tributaries or swamps. The effectiveness of the treatment will be monitored with sentinel fish placed in cages throughout the treated streams. A bioassay will be conducted prior to the treatment to verify the degree of toxicity of the rotenone. Flow, pH, dissolved oxygen, turbidity, and conductivity will be measured immediately prior to treatment so exact chemical rates can be determined for each stream and site. Personnel and equipment will be transported to each drip site before treatment.

Table 3. Streams in the Willow Creek Drainage that will be treated with the number of rotenone drip stations and approximate locations.

Stream	Number of rotenone drip stations	Location of Stations
West Willow Ck.	10	Two mile intervals from head to confluence with East Willow
Steer Gulch	2	Head of stream and one two miles lower
Corral Creek	1	Head of stream
Clear Creek	1	One mile above the confluence with West Willow
East Willow Ck.	1	Near the confluence with West Willow.
Pioche Creek	1	Approximately two miles above West Willow confluence.
Meadow Creek	1	Upstream from confluence with Willow Creek.

Native speckled dace and mountain suckers will be salvaged before the rotenone treatment using backpack electrofishing units. Population estimates of these species will be conducted at two locations on West Willow Creek during the salvage effort. Population estimates will be calculated using a depletion method. Population estimates will provide baseline data for the pre-treatment status of native species for comparison with post-treatment monitoring data. The preferred option for preserving salvaged native fish until the streams have been treated is to remove fish during the summer of 2006 and transport them to the fishless portion of Pioche Creek to live until the treatment is complete.

A quantity of non-native fish will be captured just before treatment for use as sentinel fish during treatment. These fish will be held in wire cages in the streams approximately two miles below each drip station to act as sentinel fish or indicators of the effectiveness of the rotenone supplied from these stations. It is estimated that the treatment of streams in the Willow Creek Drainage will require approximately 28 gallons of rotenone (Table 4).

Table 4. Estimate of rotenone needed to treat selected streams in the Willow Creek Drainage, Grand and Uintah counties, Utah.

Stream	Flow (cfs) [1]	Rotenone Concentration (ppm)	Exposure Time (hours)	Rotenone Amount (gallons)	No. of Stations	Total Rotenone [2] (gallons)
Steer Gulch	2	3.0	6	0.969	2	1.940
Corral Creek	1	3.0	6	0.486	1	0.486
West Willow Creek	4	3.0	6	1.94	10	19.400
Clear Creek	1	3.0	6	0.486	1	0.486
East Willow Creek	6	3.0	6	2.90	1	2.900
Pioche Creek	2	3.0	6	0.969	1	0.969
Meadow Creek	3	3.0	6	1.46	1	1.460
Total					**17**	**27.641**

[1] Stream flows calculated in the summer of 2004.
[2] Estimate of rotenone volume required for treatment based on 2004 flow records. Calculations based on the method described in "Rotenone Use in Fisheries Management", page 104, Table 3.2 (Finlayson 2000).

Powder potassium permanganate will be used as a neutralizing agent for the rotenone. The neutralization zone will be located at the confluence of Meadow Creek and Willow Creek. The detoxification station will be operated for five to seven days (24 hours per day) following the treatments. The application of the chemical would be conducted by pesticide applicators certified by the State of Utah. All personnel involved with the application will receive safety training.

The project manager will serve as project safety officer. In addition to the safety training for the application of rotenone, participants will receive helicopter safety training. A safety officer for the required helicopter flights will be designated. Personnel certified in the use of explosives will be assigned for the removal of beaver dams. The project safety officer will monitor all activities and take the necessary actions to correct any unsafe activities (Bingham et al. 2005).

2.2.2 NO ACTION

Under the No Action alternative, the current status of the waters will continue. Non native fish would not be eliminated and native Colorado River cutthroat trout would not be introduced. The purpose and need for the project would not be met.

2.2.3 ALTERNATIVES CONSIDERED BUT NOT ANALYZED FURTHER

2.2.3.1 Physical removal of non-native fish species

Electrofishing and netting are commonly used methods for the collection and sampling of fish populations. The efficiency of electrofishing is influenced by many factors associated with the characteristics of the fish, habitat, and operating conditions. Fish size influences the efficiency of electrofishing. Reynolds (1983) indicated that larger fish are more susceptible to the electric shock given the direct relationship between total body voltage and fish length. Dip-netters, individuals collecting stunned fish, may bias towards the capture of larger more visible fish. Habitat characteristics can also influence electrofishing efficiency. For example, fish metabolism can increase as a result of increased water temperature. Increased metabolism, in turn, can result in the fish increased ability to perceive and avoid the electrical field. Further, weather conditions, the experience of the crew, and reliability of the equipment can influence the efficiency of electrofishing. Electro-shocking and netting are labor intensive practices and would not be practical for the removal of all the non-native salmonids (Finlayson 2000). The use of these techniques could emphasize the capture of larger fish while small fish may avoid capture and remain in the streams. Therefore, this alternative would not meet the purpose and need for the project.

2.2.3.2 Stocking of Cutthroat trout in the presence of non-native trout

Under this alternative, CRCT would be re-introduced in the presence of brook trout. Habitat loss/alteration, predation by and competition with nonnative fishes, and hybridization with nonnative trout, such as the rainbow trout, have lead to the decline of this subspecies (CRCT Task Force 2001). Introducing CRCT in the presence of non-native salmonids would not meet the purpose and need of the project. Brook trout is a sport fish native to the eastern United States and eastern Canada that has become established in many western cold higher-elevation lakes and streams. This species occupy larger territories as they grow and commonly displace cutthroat trout in streams (Benhke 1992, Meehan and Bjorn 1991). Successful reproduction of brook trout can often lead to overcrowding, and consequently, a large number of stunted (small) individuals. The overcrowding problem can be exacerbated by low fishing pressure in the brook trout's high-elevation habitat (Sigler and Sigler 1996).

Further, Kennedy et al (2003) suggested that the success of brook trout population establishment is associated with their capability to adapt to a wide range of conditions. Brook trout apparently grew more slowly (i.e., had shorter lengths-at-age) in a high-elevation stream where water temperatures were colder. These fish became sexually mature 2 years later and had life spans two to three times longer than those in a mid-elevation stream, maximizing their chance of establishment and invasion success across differing elevations. This study proposed that in mid-elevation streams fast growth and early maturity maximize fitness and can lead to rapid establishment and high population growth rates. In high-elevation streams, slow growth, later maturity, and a long reproductive life span may allow brook trout to successfully establish populations in these marginal habitats where recruitment is often poor. These life histories would allow brook trout to out compete CRCT introduced in Willow Creek.

2.3 SUMMARY OF IMPACTS

Table 5 summarizes the anticipated impacts of implementing either the Proposed Action or No-Action Alternative. The complete impact assessment is documented in Chapter 4.

Table 5. Summary and comparison of impacts.

Resource	Proposed Action	No-Action
Farmlands, Wetlands, and Riparian Vegetation	No impact to farmlands. No long-term impacts to wetlands and riparian vegetation. Trampling of vegetation could occur during treatments but this would be considered a short-term minor effect.	No impacts.
Water Quality	Short-term toxicity to aquatic organisms sensitive to rotenone. No long-term impacts. No effects on designated beneficial uses.	No impacts.
Fish	Removal of non-native fish from treated streams. Allows subsequent introduction of Colorado River cutthroat trout (CRCT). Allows the expansion of CRCT distribution and contributes to the long-term persistence of the species in accordance with the CRCT conservation agreement and strategy.	No impacts. Non-native trout would continue to occur in the area. CRCT distribution and abundance would not be increased.
Wildlife	No long-term impacts. Temporary effects associated with the reduction of aquatic invertebrates and amphibians susceptible to rotenone. Potential changes in the aquatic invertebrate community structure.	No impacts.
Threatened, Endangered, and Proposed Species	No impacts.	No impacts.
State Sensitive Species	Non-native trout would be removed. CRCT would be introduced thus increasing their distribution, abundance, and contributing to the long-term persistence of the species. Action would be in accordance with the goals and objectives of the CRCT conservation agreement and strategy.	No impacts. Non-native trout would not be removed and CRCT would not be introduced.
Public Health and Safety	No impacts. Safety measures would minimize any non-lethal potential effects of rotenone on individuals using this chemical.	No impacts.

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CHAPTER 3: AFFECTED ENVIRONMENT

3.1 INTRODUCTION

The Willow Creek Drainage (hydrologic unit 14060006), encompassing approximately 897 square miles, is a small drainage of the Green River in the Upper Colorado River Basin. This drainage consists of two sub-drainages, Willow Creek (609 square miles) and Hill Creek (288 square miles). Both creeks originate in the Roan Cliffs (the southern extension on the Book Cliffs) in northern Grand County, Utah. The lower two thirds of the drainage are located in Uintah County, Utah. Willow Creek flows 70 miles north to its confluence with the Green River a few miles south of Ouray, Utah. Most of the land within the drainage is managed by the State Institutional Trust Land Administration (SITLA). The remaining land is managed by the Ute Indian Tribe and the Utah Division of Wildlife Resources (UDWR; Figure 1). This section describes the current condition of resources within the project area that may be affected by the proposed management activities.

3.1.1 FARMLANDS, WETLANDS, AND RIPARIAN VEGETATION

There is no cultivated farmland within the project area. The nearest farmland is over 7 miles downstream below the Meadow Creek confluence where the detoxification station will be located. In addition to the stream channel and associated banks, there are no wetlands in the project area. Riparian habitat consists primarily of grasses, sedges, rushes and forbs with sections of willow and other bush species (possibly currant). Below the confluence with East Willow dominant vegetation consists of big sagebrush, rabbitbrush, box elders, willow, and greasewood with an understory of cheat grass (Birchell, personal communication). Crosby and Barlett (2000) indicated that riparian vegetation in the Willow Creek Drainage is rather limited but where it occurs it is dominated by an overstory of cottonwood-willow-tamarack with an understory of big sagebrush-rabbitbrush-greasewood and saltgrass-cheatgrass.

3.1.2 WATER QUALITY

Willow Creek is a second order stream considered perennial. However, U.S. Geological Survey (USGS) stream flow gages in the lower reaches of the stream have frequent measurements of "no-flow" in late summer. Some sections of the stream, particularly in upper reaches and below diversions, become intermittent during drought years (Crosby and Barlett 2000). Flows were recorded from 1950 to 1983 at the USGS station located on Willow Creek above diversions near Ouray (USGS Site 9307500). Flows at this site have ranged from 0.3 cfs during summer of 1960 to 259 cfs during spring of 1962. Snowmelt flows are the highest during April and May. Summer flows at this site averaged 14 cfs (USGS 2006).

Heavy sedimentation occurs in Willow Creek and its tributaries. Most stream sedimentation results from natural causes due to water flows through the desert biome. Aridic soils in this area are characterized by their low productivity and highly erosive nature. However, heavy historic livestock grazing on headwaters and lower sections of the basin contributed to the degradation of riparian vegetation and stream channels. Improvements in the condition of these areas have resulted from reduced grazing and improved management practices (Crosby and Barlett 2000).

The Willow Creek drainage is located within the Uintah Watershed Management Unit of the Utah Division of Water Quality. The designated beneficial uses for water bodies in this drainage are shown in Table 6. The middle and lower sections of Willow Creek, from its confluence with the Green River to the Meadow Creek confluence, are included in the 303(d) list of impaired water bodies for their concentration of total dissolved solids (UDWQ 2006). The upper section of the Willow Creek drainage, where the rotenone treatment will occur, has not been assessed to determine if the streams in this area support their designated beneficial use (UDWQ 2004).

Table 6. Designated beneficial use for streams in the Willow Creek drainage.

Class	Definition
2B	Protected for secondary contact recreation such as boating, wading and similar uses.
3A	Protected for cold-water species of game fish and other cold-water aquatic life, including the necessary aquatic organisms in their food chain.
4	Protected for agricultural uses including irrigation of crops and stock watering.

Source: UDWQ (2004).

3.1.3 FISH

Colorado River cutthroat trout is the only trout species native to tributaries on the Green River in the Uintah Basin. Currently, CRCT only exist in fragmented population within their historic range (Lentsch and Converse 1997). In the northeast region of Utah, populations of "pure" CRCT are located on both the south and north slopes of the Uintah Mountain Range and the North Tavaputs Plateau (Bingham et al. 2005). Habitat loss/alteration, predation by and competition with nonnative fishes (e.g., brook trout), and hybridization with nonnative trout (e.g., rainbow trout) have lead to the decline of this subspecies. A brief description of life history characteristics for CRCT is included in the State Sensitive Species section.

Fishery resources and sportfishing opportunities in the Willow Creek drainage are very limited due to the lack of sufficient suitable waters. The upper 20 mile section of Willow Creek and West Willow Creek are considered moderately important for sportfishing (Class 3). Natural reproduction of native species occurs in these streams and they are therefore managed as wild populations. Spackled dace, mountain sucker, rainbow trout (*Oncorhynchus mykiss*), and brook trout have been observed in the Willow Creek drainage (Crosby and Bartlett 2000). The status of these species is shown in Table 7.

Table 7. Fish species in the Willow Creek drainage, Grand and Uintah counties, Utah.

Species	Native/Non-Native	Special Status
Speckled dace (*Rhinichthys osculus*)	Native	None
Mountain sucker (*Catostomus platyrhynchus*)	Native	None
Rainbow trout (*Oncorhynchus mykiss*)	Non-Native	None
Brook trout (*Salvenlinus fontinalis*)	Non-Native	None
Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*) [1]	Native	CS [2]

[1] Historical distribution.
[2] CS: Species managed under a Conservation Agreement in order to preclude the need for federal listing.

Brook trout is a sport fish native to the eastern United States and eastern Canada. Although not native to Utah, this species has become established in many of Utah's cold higher-elevation lakes and streams. As described above, the life history characteristics of this species allow them to successfully compete with CRCT. The brook trout primarily eats invertebrates, including insects and zooplankton. Large individuals occasionally prey on small fishes. The species spawns in the fall. October is the typical time for spawning over most of their range. Redds are typically constructed on gravel but brook trout can also spawn on sand or silty-sandy substrate. Eggs hatch in about two months. Most brook trout live their entire lives in relatively short stream reaches or in small lakes. Movement is minimal in stream and river habitats. Alevins disperse from redds into shallow waters until they have established territories. They occupy larger territories as they grow, often in deeper water (Meehan and Bjorn 1991). Successful reproduction of brook trout can often lead to overcrowding, and consequently, a large number of stunted (small) individuals. The overcrowding problem can be exacerbated by low fishing pressure in the brook trout's high-elevation habitat (Sigler and Sigler 1996).

Fisheries records for the Willow Creek drainage are limited. In 2004, the UDWR conducted stream and fisheries surveys on the mainstem of Willow Creek, West Willow Creek, and Steer Gulch. No fish were observed on the mainstem section of Willow Creek from the Uintah-Grand county line to the confluence of the East and West Willow forks. Presumably, speckled dace and mountain sucker could occur in this area but none have been observed during surveys conducted during 2001 and 2004 (UDWR, unpublished data).

Speckled dace and hybridized cutthroat trout were captured on West Willow Creek, just upstream from the East-West Willow creeks confluence. These species and one mountain sucker were captured on this stream near the Clear Creek confluence. No fish were captured on the East Willow Creek upstream of its confluence with West Willow Creek. Brook trout and hybridized cutthroat trout were captured on Steer Gulch (UDWR, unpublished data). Speckled dace and mountain sucker are the only native fish species occurring in the drainage. A summary of fisheries surveys conducted on the Willow Creek drainage is shown in Table 8.

3.1.4 WILDLIFE

The Willow Creek drainage provides habitat to a number of aquatic and terrestrial species. A summary of the species that have been documented in the drainage or have suitable habitat in this area is shown in Table 9. In addition to fish, other aquatic species such as invertebrates and amphibians are susceptible to rotenone and could be directly affected by the Proposed Action. Fish, amphibians, and reptile species included in Table 9 have been found in the Willow Creek drainage (Crosby and Bartlett 2000). It should be noted that only a few surveys for amphibians and reptiles have been conducted in the project area and documented records for species in these groups are limited.

Table 8. Summary of fish surveys conducted on the Willow Creek drainage, Grand and Uintah Counties, Utah.

Stream	Survey site	Year	Station length (m)	Species [1]	Population estimate (fish/mile)
Willow Creek	Mainstem from Hill Creek confluence to Grand-Uintah county line	2001	161	None captured	-
	Mainstem from Grand-Uintah county line to East-West Willow Creek confluence	2004	185	None captured	-
West Willow Creek	Just upstream from the East-West Willow Creek confluence	1992	159	CT	69
				SD	NA
				MS	NA
	Near Clear Creek confluence	2004	185	CT	565
				SD	NA
				MS	NA
Steer Gulch	Upstream from its confluence with West Willow Creek	2004	185	CT	35
				BT	191

[1] CT: Cutthroat trout hybridized with rainbow trout; SD: Speckled dace; MS: Mountain sucker; BT: Brook trout.

According to the UDWR species database, the Willow Creek drainage provides summer critical habitat for mule deer (*Odocoileus hemionus)* and elk (*Cervus Canadensis)*. This drainage is also categorized year long high, substantial, and critical habitat for black bear (*Ursus americanus*), blue grouse (*Dendragapus obscurus*), and turkey (*Maleagris gallopavo*), respectively. It also provides brooding habitat for sage grouse. The nearest sage grouse *(Centrocercus urophasianus)* lek, however, is located over 15,000 meters from the treatment area. Ferruginous hawk (*Buteo regalis*) has been observed in the vicinity of the project area (Sullivan 2006, personal communication). No raptor nests occur near the treatment area (Wood 2006, Personal communication).

3.1.5 THREATENED, ENDANGERED, AND PROPOSED SPECIES

Threatened, endangered, and proposed species listed by the U.S Fish and Wildlife Service (USFWS) include 12 and 16 species in Grand and Uintah counties, respectively (Table 10). None of these species or their critical habitat occur in the Willow Creek drainage. However, Willow Creek is a tributary of the Green River which has been designated critical habitat for endangered razorback sucker (*Xyrauchen texanus*), Colorado pikeminnow (*Ptychocheilus lucius*), humpback chub (*Gila cypha*), and bonytail (*Gila elegans*) (USFWS 1994). The confluence of Willow Creek with the Green River is located approximately 42 miles downstream from the rotenone detoxification station.

Table 9. Wildlife species in the Willow Creek drainage, Grand and Uintah counties, Utah.

Species	Native/Non-Native	Special status
Invertebrates		
Eureka mountain snail (*Oreohelix eurekensis*) [1, 4]	Native	State Sensitive
Amphibians		
Northern leopard frog (*Rana pipiens*)[2]	Native	None
Woodhouse's toad (*Bufo woodhousii*) [2]	Native	None
Tiger salamander (*Ambystoma tigrinum*) [2]	Native	None
Reptiles		
Desert horned lizard (*Phrynosoma platyrhinos*) [2]	Native	None
Great Basin gopher snake (*Pituophis catenifer deserticola*) [2]	Native	None
Midget faded rattlesnake (*Crotalus viridis concolor*) [2]	Native	None
Northern side-blotched lizard (*Uta stansburiana uniformis*) [2]	Native	None
Northern tree lizard (*Urosaurus ornatus wrighti*) [2]	Native	None
Short-horned lizard (*Phrynosoma douglassii*) [2]	Native	None
Striped whipsnake (*Masticophis tacniatus*) [2]	Native	None
Wandering gopher snake (*Thamnophis elegans vargrans*) [2]	Native	None
Birds		
Sage Grouse (*Centrocercus urophasianus*)[3]	Native	State Sensitive
Blue Grouse (*Dendragapus obscurus*) [3]	Native	None
Turkeys [3] *(Maleagris gallopavo)*	Native	None
Ferruginous hawk (*Buteo regalis*) [1]	Native	State Sensitive
Mammals		
American beaver (*Castor Canadensis*)	Native	None
Mule deer (*Odocoileus hemionus*) [3]	Native	None
Elk (*Cervus Canadensis*) [3]	Native	None
Black bear (*Ursus americanus*) [3]	Native	None
Big free-tailed bat (*Nyctinomops macrotis*)[1, 4]	Native	State Sensitive
Townsend's big-eared bat (*Corynorhinus townsendii*) [1, 4]	Native	State Sensitive

[1] Source: Sullivan (2006), personal communication.
[2] Source: Crosby and Bartlett (2000).
[3] Source: Wood (2006), personal communication.
[4] Historical records of occurrence.

Table 10. Threatened and endangered species lists for Grand and Uintah Counties, Utah.

Common name	Listing Status[1]	Occurrence Potential
Grand County		
Bald eagle *Haliaeetus leucocephalus*	T	Possible. Only eight nesting pairs known in the state. Nesting does occur in this county. A winter foraging population could potentially occur in the county and roost in large conifers on steep canyon walls. Not observed in roadless areas near the project area.
Black-footed ferret *Mustela nigripes*	E	None. Historic range land for this species is found in the county. The project area does not have any potential habitat or prairie dog colonies. Reintroduction efforts have taken place on the south side of the Book Cliffs in the UDWR Price Region.
Bonytail *Gila elegans*	E	None. Critical habitat within the county is limited to the Green River. The project area does not have any potential habitat. No critical habitat occurs in the Willow Creek drainage.
California condor *Gymnogyps californianus*	E	None. The county represents historic range for the species which currently is classified in the area as an experimental, non-essential population. Reintroduced condors have not migrated into the area.
Colorado pikeminnow *Ptychocheilus lucius*	E	None. Critical habitat within the county is limited to the Green River. The project area does not have any potential habitat. No critical habitat occurs in the Willow Creek drainage.
Gunnison sage-grouse *Centrocercus minimus*	C	None. Primary habitat is sagebrush of which much is found in the area. However, the nearest lek is 15 km from the project area.
Humpback chub *Gila cypha*	E	None. Critical habitat within the county is limited to the Green River. The project area does not have any potential habitat. No critical habitat occurs in the Willow Creek drainage.
Jones cycladenia *Cycladenia humilis var. jonesii*	T	None. Habitat restricted to the canyonlands of the Colorado Plateau in Emery, Garfield, Grand, Kane, and Utah counties. Known distribution in Grand county limited to the south east corner of the county.
Mexican spotted owl *Strix occidentalis*	T	Possible. Douglas and true fir forests as well as steep canyons with cliffs and a perennial water source are found in the project area. However, surveys have been done and no Mexican spotted owls have been located in the project or surrounding area. Surveys have been done near the detoxification station with no owls found. The closest records are in Desolation Canyon.
Razorback sucker *Xyrauchen texanus*	E	None. Critical habitat within the county is limited to the Green River. The project area does not have any potential habitat. No critical habitat occurs in the Willow Creek drainage.
Southwestern willow flycatcher *Empidonax traillii extimus*	E	None. Many surveys have been completed, but most reveal the parent species *E. traillii*. A few of the *E.t. extimus* subspecies have possibly been located in the region, but not the project area. One possible pair stayed in area into late season. Surveys focused on Green River corridor Ouray to Green River, Utah. The project area contains potential, limited habitat, but is outside elevation gradient for the southwestern subspecies.

Table 10. (cont'd) Threatened and endangered species lists for Grand and Uintah Counties, Utah.

Common name	Listing Status[1]	Occurrence Potential
Yellow-billed cuckoo *Coccyzus americanus*	C	None. Extensive surveys have been completed for this species in the region. Some individuals have been found in Green River corridor. None have been found in the project area which is lacking in habitat.
Uintah County		
Bald eagle *Haliaeetus leucocephalus*	T	Possible. Only eight nesting pairs known in the state. Nesting does not occur in this county. A wintering foraging population could potentially occur in the county and roost in large conifers on steep canyon walls. Not observed in roadless areas near the project area.
Black-footed ferret *Mustela nigripes*	E	None. Historic range land for this species is found in the county. The project area does not have any potential habitat or prairie dog colonies. Some ferrets are located in Coyote Basin, roughly 50-60 miles SE of Vernal. This is an experimental, non-essential population.
Bonytail *Gila elegans*	E	None. Critical habitat within the county is limited to the Green River. The project area does not have any potential habitat. No critical habitat occurs in the Willow Creek drainage.
Canada lynx *Lynx canadensis*	T	None. The project area is dominated by PJ/mountain mahogany scrubland with some areas of mixed conifer. There is neither habitat nor preferred prey base of snowshoe hares or red squirrels. The only habitat in the county is in the High Uintah mountains, north of Vernal.
Clay reed-mustard *Schoenocrambe argillacea*	T	None. Habitat limited to the Uinta Basin, Uintah County. Occurs in precipitous slopes in mixed desert shrub communities in elevations ranging from 1,439 to 1,765 meters. Known distribution located north west of the project area.
Colorado pikeminnow *Ptychocheilus lucius*	E	None. Critical habitat within the county is limited to the Green River. The project area does not have any potential habitat. No critical habitat occurs in the Willow Creek drainage.
Graham beardtongue *Penstemon grahamii*	P	None. This species is limited to shale outcrops in lower elevations. Endemic to the Green River Formation in the Book Cliffs. There is no habitat in project area.
Horseshoe milk-vetch *Astragalus equisolensis*	E	None. Occurs at a single site in the Uintah County on river terrace sands and gravels overlying the Duchesne River Formation. Known distribution located several hundred miles north of the project area.
Humpback chub *Gila cypha*	E	None. Critical habitat within the county is limited to the Green River. The project area does not have any potential habitat. No critical habitat occurs in the Willow Creek drainage.
Mexican spotted owl *Strix occidentalis*	T	Possible. Douglas and true fir forests as well as steep canyons with cliffs and a perennial water source are found in the project area. However, surveys have been done and no Mexican spotted owls have been located in the project or surrounding area. Surveys have been done near the detoxification station with no owls found. The closest records are in Desolation Canyon.
Razorback sucker *Xyrauchen texanus*	E	None. Critical habitat within the county is limited to the Green River. The project area does not have any potential habitat. No critical habitat occurs in the Willow Creek drainage.

Table 10. (cont'd) Threatened and endangered species lists for Grand and Uintah Counties, Utah.

Common name	Listing Status[1]	Occurrence Potential
Shrubby reed-mustard *Schoenocrambe suffrutescens*	E	None. Occurs in the Uinta Basin in Duchesne and Uintah counties. Grows on semi barren, white-shale layers of the Green river Formation. Found in xeric, shallow, fine textured soils intermixed with shale fragments. Known distribution located near the south west corner of Uinta County, north of the project area.
Uintah Basin hookless cactus *Sclerocactus glaucuc*	T	None. This species is located in lower elevation, salt desert scrub community. No habitat is located in the project area.
Ute ladies'-tresses *Spiranthes diluvialis*	T	None. It is found along streams, bogs, and open seepage areas in cottonwood, tamarisk, willow and pinyon/juniper communities between 4,400 and 6,810 feet in elevation. It is limited to riparian areas at lower elevations in Green and Duchene River basins. Not known in the project area.
White River beardtongue *Penstemon scariosus var. albifluvis*	C	None. This species is limited to shale outcrops in lower elevations and found on semi-barren areas of xeric, shallow, finely textured soils. It is endemic to the Green River Formation in the Book Cliffs. There is no habitat in project area.
Yellow-billed cuckoo *Coccyzus americanus*	C	None. Extensive surveys have been completed for this species in the region. Some individuals have been found in Green River corridor. None have been found in the project area which is lacking in habitat.

Source: USFWS (2006).
[1] Symbols: C = Candidate, E = Endangered, T = Threatened.
Shaded rows indicate species that potentially occur downstream from the treatment area in Willow Creek drainage.

3.1.6 STATE SENSITIVE SPECIES

General life history information is provided only for those species with a potential to occur in the project area or its close vicinity: eureka mountain snail, greater sage-grouse and ferruginous hawk. A general life history description for Colorado River cutthroat trout, which will be re-introduced following the rotenone treatments, is also provided.

3.1.6.1 Eureka Mountainsnail

The Eureka mountainsnail *(Oreohelix eurekensis)* is a rare terrestrial species endemic to Utah and has been reported from a limited number of localities including the northern part of the East Tintic Mountains, on the Juab-Toole county line; on Hominy Creek, on the south slope of the Uinta Mountains near the Duchesne-Uintah county line; on the Deep Creek Mountains, near the Juab-Toole county line; and on the East Tavaputs Plateau in Grand County. The presence of this species in the East Tintic Mountains was based on historic observations of old dead shells and a few live individuals. This species has been found in elevations ranging from 2200 meters to 2438 meters. Habitats utilized by this snail include limestone under pygmy sagebrush, the bases of ledges on north facing slopes, the base and trunk of aspen trees, and dead leaves at the base of aspen (Oliver and Bosworth 1999). Historic reports have documented the occurrence of the Eureka mountainsnail on the Hill Creek Drainage. This drainage is adjacent to Willow Creek. This species had not been observed in the Willow Creek drainage (Sullivan, personal communication).

3.1.6.2 Greater Sage-Grouse

Greater sage-grouse is the only sensitive species that occurs in the Willow Creek drainage. This species is native to Utah and is listed as a sensitive species by the UDWR. Sagebrush and sagebrush habitats are essential for the survival of this species (Parrish et al 2002). Optimum habitat is characterized by a good understory of grasses and forbs, and associated wet meadow areas. The principal winter food item is sagebrush leaves. During summer, the fruiting heads of sagebrush, leaves and flower heads of clovers, dandelions, grasses and other plants are taken. Insects are also taken during the summer. Both population size and distribution of this species have declined due to sagebrush eradication, cropland conversion, and intensive use of lands by domestic livestock (Rawley et al 1996).

The Willow Creek drainage provides brooding habitat for this species. Recent occurrences of sage-grouse have been documented north of the treatment area approximately 10 miles from the East Willow Creek confluence (Sullivan 2006, personal communication). The nearest lek is located over 15,000 meters from the area where rotenone treatment would occur (Wood 2006, personal communication). The lower elevations of the drainage present desert type communities of sagebrush, greasewood, rabbitbrush and shadscale. Riparian vegetation is limited along streams in the drainage. Where present, it is dominated by cottonwood-willow-tamarack overstory with a big sagebrush-rabbitbrush-greasewood and saltgrass-cheatgrass understory (Crosby and Bartlett 2000).

3.1.6.3 Ferruginous Hawk

Ferruginous hawks, also considered a sensitive species in the State of Utah, has been observed in the vicinity of the Willow Creek drainage, approximately 10 miles east of the treatment area (Sullivan 2006, personal communication). This species breeds in western North America from southernmost Canada between the Great Plains and Rocky Mountains south to northern Utah and New Mexico. Central Utah is one of the areas where this species winters. Flat and rolling terrain in grassland or shrub steppe is most used during breeding (Parrish et al. 2002).

The ferruginous hawk is an open-country species that inhabits grasslands, shrubsteppes, and deserts of North America, nesting in 17 states in the United States and 3 provinces in Canada. This hawk avoids montane forests, aspen parkland, and habitats recently altered by agricultural cultivation. Before the elimination of bison in the west, its nests were often partially constructed of bison bones and wool. Today, this hawk uses nesting substrates ranging from cliffs, trees, utility structures, and farm buildings to haystacks and relatively level ground. (Bechard and Schmutz 1995).

3.1.6.4 Colorado River Cutthroat Trout

As stated in Section 2.2.1., CRCT is a sensitive species in the State of Utah. CRCT are the only trout species native to tributaries of the Green River in the Uintah Basin. This species was distributed in all suitable waters of the basin but has declined drastically throughout their historic range due to loss of habitat, interspecific competition with non-native fishes, and loss of genetic purity from hybridization with rainbow and other subspecies of cutthroat trout. This species is currently managed under a Conservation Agreement and Strategy for CRCT in the State of Utah (Lentch and Converse 1997). Willow Creek was identified in this agreement for CRCT management. Recent surveys indicated that some of the tributaries of the Willow Creek would be suitable for CRCT restoration (Crosby and Bartlett 2000; Bingham et al. 2005).

The CRCT is native to the upper Colorado River drainage of Utah, Wyoming, Colorado, Arizona, and New Mexico. Unfortunately, pure CRCT are now very rare throughout their historic range. Habitat loss/alteration, predation by and competition with non-native fishes, and hybridization with non-native trout, such as the rainbow trout, have lead to the decline of this subspecies. Currently, the natural distribution of pure CRCT is limited to isolated high-elevation headwater streams. Hybrid cutthroat trout are more common. This subspecies is designated as a special status species by Colorado, Utah, and Wyoming, and is currently managed under a conservation agreement and strategy designed by these states (CRCT Task Force 2001).

The cool, clear water of high-elevation streams and lakes is the preferred habitat for CRCT (Sigler and Sigler 1996). Throughout their range, cutthroat trout spawn in the spring or early summer. Eggs hatch and young fish emerge from the redds in the summer. They commonly rear for 2 or more years in small streams and then migrate downstream to larger rivers or lakes for a final period of rearing before reaching maturity. Spawning migration for non-anadromous cutthroat occurs in the spring. However, fish in some populations remain in the same area of a stream their entire lives (Meehan and Bjorn 1991).

3.1.7 PUBLIC HEALTH AND SAFETY

As stated above, Willow Creek is largely unpopulated. Several small communities are located north of the Willow Creek drainage boundary. A summary of major population centers and water bodies in the vicinity of the drainage are shown in Table 11.

Table 11. Population centers and major water bodies in the vicinity of Willow Creek drainage, Grand and Uintah Counties, Utah.

Major Population Centers	Distance from Willow Creek drainage (miles)
Vernal	45
Roosevelt	45
Water Bodies	
Pelican Lake	10
Green River	Meets at confluence (42 miles below detoxification station).
Duchesne River	5
Steinmaker Reservoir	50
Flaming Gorge Reservoir	90

Safety issues associated with the Proposed Action include the application of rotenone, the transportation of personnel and gear via helicopter, and the use of dynamite for the removal of beaver dams. As described above, the project manager would serve as project safety officer and all personnel involved would receive pesticide application and helicopter safety training. The removal of beaver dams would be conducted by personnel certified in the use of explosives.

Washing facilities at each rotenone drip station would be supplied with clean water, soap, towels, eye wash bottle and moist towelettes. Personnel handling chemicals would wear protective equipment including coveralls, gloves, respirator, and gloves (Bingham et al. 2005).

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

4.1 FARMLANDS, WETLANDS, AND RIPARIAN VEGETATION

4.1.1 NO ACTION: DIRECT, INDIRECT, AND CUMULATIVE EFFECTS

The No Action Alternative would not lead to any direct, indirect, or cumulative effects to farmlands, wetlands, or riparian vegetation.

4.1.2 PROPOSED ACTION: DIRECT, INDIRECT, AND CUMULATIVE EFFECTS

Negative impacts on farmlands, wetlands, and riparian vegetation are not anticipated from the implementation of the Proposed Action. No changes in the present grazing practices are included under the Proposed Action. As described above, no wetlands have been identified and there is no cultivated farmland within the project area. The nearest farmland is over 7 miles downstream below the Meadow Creek confluence where the detoxification station will be located. Further, riparian vegetation in the Willow Creek drainage is limited. Where it occurs it is dominated by an overstory of cottonwood-willow-tamarisk with an understory of big sage-rabbitbrush-greasewood and saltgrass-cheatgrass. Rotenone does not have an effect on plants at the concentrations used for the removal of fish. Activities associated with the application of rotenone are likely to result in trampling of understory vegetation, but this short-term effect would be considered insignificant.

4.2 WATER QUALITY

4.2.1 NO ACTION: DIRECT, INDIRECT, AND CUMULATIVE EFFECTS

The rotenone treatment would not occur under this alternative. There would be no direct, indirect, or cumulative effects on water quality under the No Action Alternative.

4.2.2 PROPOSED ACTION: DIRECT, INDIRECT, AND CUMULATIVE EFFECTS

No long term impacts on water quality would result from the implementation of the Proposed Action. Rotenone would be flushed from treated channels within a few days of the treatment and would not affect any of the designated beneficial uses of the treated streams.

Liquid emulsifiable rotenone, Noxfish or Prenfish, are EPA-registered chemicals (Registration No. 432-172 and 655-422, respectively) that have been extensively used by fish managers in North America for the management and assessment of fish populations. Adverse long-term impacts to water quality associated with the treatment of streams in the Willow Creek drainage with rotenone would not be anticipated. Short-term direct effects would be associated with the toxicity of rotenone to aquatic organisms including invertebrates and fish.

The implementation of the Proposed Action would lead to temporary reductions of aquatic invertebrate abundance and could affect invertebrate community structure. Reaches upstream of the treatment areas would help the re-colonization process of the treated areas. Sensitivity to rotenone among aquatic invertebrates is highly variable although most species are more resistant than fish. However, rotenone treatments eliminate most invertebrates because field applications typically use concentrations in excess of the lethal dose for fish in order to ensure a complete fish kill. The effects on invertebrates are usually more noticeable close to the application stations. Rotenone not only causes mortality but also increases invertebrate drift downstream (Ling 2003). Mangum and Madrigal (1999) found that some invertebrate species were unaffected by a rotenone treatment, some species recovered after one year, and others were still missing five years after the treatment. Most of the species that failed to recover were mayflies, stoneflies, and caddis flies. Although some of the species that were observed before the treatment did not recover, other new species appeared after the treatment and possibly filled vacated niches. Cook and Moore's (1969) assessment of invertebrate communities before and after a rotenone treatment concluded that little lasting effect was evident for the non-target invertebrate fauna. However, they emphasized that only a portion of a stream was treated which permitted re-population from the untreated stream sections. They also indicated that the rotenone treatment could lead to changes in the invertebrate community structure. Changes in the invertebrate community structure would not be considered a significant impact. Mangum and Madrigal (1999) indicated that species not present before rotenone treatments can appear following the treatment and fill the niches of the species that do not recover.

An indirect effect of the treatment on water quality would be a short-term increase in nutrient input to the water due to the decomposition of the fish that are killed. This effect would occur over a short period of time while decomposition occurs. Natural decomposition will add nutrients that could become available to macrophytes and algae and subsequently to aquatic invertebrates. The potential effects of the Proposed Action on fish species are discussed in Section 4.3.

Long-term effects on water quality are not anticipated due to the limited persistence of rotenone in natural waters. The toxicity of rotenone can be reduced by natural breakdown, dilution by fresh water, and/or oxidation by a chemical agent. Rotenone is generally unstable and degrades rapidly in water. Rotenone is photochemically unstable and will breakdown in the presence of light, heat, and oxygen (Ling 2003). High temperatures accelerate the degradation process. The length of degradation is also influenced by turbidity, depth, presence of organic matter, and the concentration of the dose applied. Bradbury (1986) indicated that rotenone tends to breakdown more readily in shallow waters. Warm surface temperatures and light penetration contribute to the faster breakdown of rotenone in shallow surface waters.

Rotenone persistence in natural waters can vary from a few days to several weeks depending on the temperature. The longest half-life of rotenone occurs in winter, while during summer it can last as little as a few hours (Ling 2003). In general, the half life of rotenone in natural waters above 20 °C is less than one day. Gilderhus et al. (1986) assessed the effect of temperature on rotenone in shallow ponds and found that it degraded ten times faster in water at 23 °C than at 1 °C. Sediments and abundant vegetation can detoxify rotenone by adsorbing much of what is applied (Bettolli and Maceina 1996). Gilderhus (1982) and Dawson et al. (1991) found that the loss of rotenone, in ponds treated with the chemical did not result only from chemical decay. A considerable fraction of the rotenone applied to a water body is lost as it adsorbed to suspended or bottom sediments. Rotenone does not persist in the sediment and due to chemical breakdown its concentration decreases to below detection limits within 3 days at 14-22 °C, and within 14 days at 8 °C. However, Dawson et al. (1991) indicated that rotenone degrades at a slower rate when bonded to sediment or organic particles. Turbidity and organic debris in water will slow down

the decay of rotenone. Further, high turbidity can decrease light penetration into the water and would decrease the degradation rate of rotenone.

Various studies of rotenone effects on water quality have concluded that treated streams had no noticeable water chemistry changes. Of the parameters considered in those studies, only four showed significant changes due to the treatment. A disagreeable change in water taste and odor occurred, turbidity decreased, the levels of algae changed, and non-coliform bacteria increased Bradbury (1986). The kerosene odor reported following the application of rotenone has been attributed to the hydrocarbon solvents in the rotenone formulations. These odors disappeared five days after treatment. A fishy odor due to decaying fish can also occur but it would be expected to disappear within a few days of the treatment. Changes in turbidity and transparency have been associated with the removal of bottom-scavenging fish (e.g., carp). Species that could affect turbidity levels and transparency do not occur in the Willow Creek drainage and these effects are not anticipated.

In addition to the natural breakdown of rotenone in water, this chemical is rapidly detoxified by the addition of a strong oxidizing agent. Potassium permanganate is considered the most effective and practical method of rotenone detoxification (Bradbury 1986). This strong oxidizing agent can be used to reverse the toxic effects in fish or to accelerate the natural breakdown of rotenone in water. It has been used to detoxify water downstream of treated stream reaches and outlet streams flowing from treated lakes. Jackson (1957) as cited in Engstron-Heg (1972) showed that 1 ppm of potassium permanganate will detoxify an approximately equal concentration of 5 percent rotenone formulation within 24 hours. Engstron-Heg (1972) stated that several reports of field observations made during the treatment streams suggested that detoxification occurred almost immediately. Potassium permanganate prevents oxygen depletion. It indirectly causes the soluble oxygen to increase in the water by oxidizing the inorganic and organic materials which generally consume oxygen. Lay (1971) indicated that the use of permanganate apparently had no negative effects on the quality of the water treated.

It is anticipated that rotenone applied in Willow Creek would breakdown and lose its toxic effect within a few days of its application due to higher summer water temperatures, the shallow depth of the streams that would be treated, and the heavy sedimentation that occurs in these streams. The limited riparian vegetation would allow direct exposure of treated water and would increase the rate of rotenone breakdown. Further, the use of potassium permanganate at the detoxification station would prevent impacts to water quality below the treated streams and stream sections.

4.3 FISH

4.3.1 NO ACTION: DIRECT, INDIRECT, AND CUMULATIVE EFFECTS

Under the No Action Alternative, the current fish community composition and abundance would persist. Non-native trout (i.e., brook trout, rainbow trout, and CRCT hybrids) would continue to inhabit streams in the Willow Creek drainage and no progress would be made towards the introduction and long-term persistence of CRCT. No progress would be made towards meeting the goals and objectives of the CRCT Conservation Agreement and Strategy.

4.3.2 PROPOSED ACTION: DIRECT, INDIRECT, AND CUMULATIVE EFFECTS

The implementation of the Proposed Action would have deleterious effects on non-native fish populations that currently occur in the Willow Creek drainage. The rotenone treatment of streams in this drainage would affect fish populations directly by causing mortality. Rotenone is highly toxic to fish. Toxicity tests have indicated that the 24 hour median lethal dose (i.e., dose that caused 50 percent mortality within 24 hours of exposure; LC50-24 hour) for fish ranges from 5 to 100 ug/L of toxicant. Rotenone is a highly specific metabolic poison that affects cellular aerobic respiration (Ling 2003). The poisoning effect of rotenone in fish takes place at the cellular level by blocking the oxidative phosphorylation in the gills (Fukami et al. 1967). The study of Fajt and Grizzle's (1998) on carp indicated that fish death likely result from rotenone inhibiting a mitochondrial enzyme (i.e., mitochondrial NADH-ubiquinone reductase) which makes oxygen unavailable for respiration. Rotenone is rapidly absorbed across the gill epithelium and transported to the tissues in the blood where it blocks oxygen use by the cells. Death results from tissue anoxia, particularly associated with cardiac and neurological failure. Behavioral changes such as reduced opercular movement, erratic swimming, increased ventilation rate with frequent coughing, gulping for air, and loss of equilibrium provide evidence of the effects of rotenone to the respiratory system in fish (Ling 2003).

Temperature and contact time are the main factors influencing rotenone toxicity. The time required to cause mortality decreases with increasing water temperature. Sensitivity to rotenone varies across species with salmonids being the most sensitive while higher tolerance has been observed in goldfish, carp, and catfish. Ling (2003) provided a summary of the toxicity of rotenone to various species. According to this summary, the LC50 24-hour for rainbow trout ranged from 3.4 ug/L at 12 °C to 2.2 ug/L at 17 °C. Reports of LC50-24 hour for common carp (*Cyprinus carpio*) have ranged from 4.2 ug/L at 12 °C to 30 ug/L at 11 °C. Toxicity tests on white suckers (*Catostomus commersoni*) have indicated that LC50-24 hour for this species is approximately 7 ug/L. Finlayson (2000) provided results of rotenone toxicity tests on several fish species conducted by other authors which indicate that the LC50 24-hour for brook trout is 2.35 ug/L. These variations in sensitivity across species may be due to differences in the levels of liver enzymes responsible for the chemical breakdown of rotenone. Another reason why these differences occur may be associated with the physiology of hypoxia-tolerant species (Ling 2003).

The effects of rotenone on fish also vary depending on the dose and life stage at which fish are exposed. Prolonged exposure to rotenone does not result in the accumulation of this substance in the fish body. Fish that do not receive a lethal dose would recover in a short period of time. Exposure of eggs to doses that would be lethal to fish would not cause their mortality. Rotenone does not kill fish eggs until the shell ruptures at hatching (Finlayson 2000). Ling (2003) indicated that eggs of susceptible species are around 100 times less susceptible to the toxic effects of rotenone than juvenile and adult fish. Various authors cited in Bradbury (1986) have reported similar findings; newly fertilized eggs of rainbow trout were reported to be 47 to 106 times more resistant to Noxfish than fingerlings of the same species, salmon eggs were 10 times more resistant to Noxfish than salmon fry, and experiments with rainbow smelt eggs have shown that they are approximately 10 times more resistant to rotenone than the larval form.

As stated above, speckled dace, mountain sucker, rainbow trout, brook trout, and hybridized CRCT occur in the Willow Creek drainage. Existing native fish, speckled dace and mountain suckers, would be salvaged prior to the treatment through electro-fishing and would not be impacted by the treatment with rotenone. It is likely that the salvage of these species and their transplant would lead to some mortality. However, it is unlikely that these operations would result in long-term population effects.

Rainbow trout, brook trout, and hybridized CRCT would be exposed to lethal concentrations of rotenone. These non-native species would be killed. However, it is likely that some fish would survive as a result of individual tolerance or un-even distribution of rotenone along the treated areas. The second, and possibly third, rotenone treatments in subsequent years would likely kill juvenile and adult survivors of the first rotenone treatment and young fish that may hatch following the initial summer treatment. The effectiveness of the rotenone dose on target species would be assessed by the use of sentinel fish below dripping stations.

As stated in the water quality section, it is anticipated that rotenone applied in Willow Creek would breakdown and lose its toxic effect within a few days of its application. The use of potassium permanganate at the detoxification station would prevent impacts to water quality and fish that occur below the treated streams and stream sections. The effectiveness of this chemical for the neutralization of rotenone would be reflected on the survival of sentinel fish positioned below the detoxification station.

The implementation of the Proposed Action would result in the removal of non-native salmonids from the treated streams and would allow the introduction of CRCT. The introduction of CRCT in streams not occupied by non-native salmonids would enhance the likelihood of the establishment of a self sustained population of CRCT in Willow Creek. The absence of brook, rainbow, and hybridized CRCT would reduce the risk of competition and hybridization with CRCT. Increased growth and survival of introduced CRCT are two indirect long-term effects of the rotenone treatment. This is anticipated because predators and/or competitors would be eliminated (Bradbury 1986).

4.4 WILDLIFE

4.4.1 NO ACTION: DIRECT, INDIRECT, AND CUMULATIVE EFFECTS

No direct, indirect, or cumulative effects to wildlife would be anticipated under the No Action Alternative. Wildlife species including aquatic invertebrates, fish, amphibians, reptiles, birds, and mammals that may occur in the Willow Creek drainage would continue to use this habitat as they do currently.

4.4.2 PROPOSED ACTION: DIRECT, INDIRECT, AND CUMULATIVE EFFECTS

Impacts to wildlife associated with the Proposed Action would be primarily limited to some aquatic invertebrates and fish. Potential impacts to these forms of aquatic life are discussed above. Most wildlife species, including birds, mammals, reptiles, adult amphibians, and some invertebrates are not susceptible to rotenone at the concentrations used for the removal of fish. Amphibian adults and reptiles are less sensitive than fish and aquatic invertebrates and should not experience negative effects when rotenone is applied at normal piscidal concentrations. Larval amphibians are susceptible to rotenone and would be killed (Fontenot et al. 1994; Ling 2003; Grisak et al. 2006). Direct, indirect or cumulative effects on terrestrial species are not anticipated.

Larval amphibians such as tadpoles are more susceptible to rotenone than metamorphosed air-breathing adults (Grisak 2003). The response of larval amphibians depends on the stage of metamorphosis. Larvae that depend on gills for respiration are more susceptible than forms that

have completely metamorphosed and lost their gills. Laboratory bioassays summarized in Bradbury (1986) indicated that the LC50 for leopard frogs was 7.3 ppm of Dry-Noxfish whereas tadpoles of the same species experience 100 percent mortality with a concentration of 0.1 ppm of 5 percent rotenone within 24 hours of exposure. Non-lethal toxic effects on tiger salamanders with gills were observed with a concentration of 0.017 ppm of 5 percent rotenone. Metamorphosed individuals of this species experience mortality with a concentration of 0.1 ppm of 5 percent rotenone within 24 hours of exposure. Therefore, larvae and gill-breathing adults (e.g., tiger salamander) of the three species of amphibians that occur in the project area (i.e., northern leopard frog, woodhouse's toad, and tiger salamander) would likely be negatively affected by the rotenone treatments conducted in summer months. Rotenone would have lethal effects on young amphibians that are always in the gilled stage during this time of the year (Bradbury 1986).

Reptiles would not be directly affected by rotenone. Indirect effects on reptiles would be associated with the loss of fish and or aquatic insects that they may include in their diets. These animals could be supported by alternative food sources during the post-rotenone shortage of fish and invertebrates (Bradbury 1986).

Other wildlife could be affected by rotenone in two ways: by ingesting rotenone (by drinking treated water or eating dead fish) and by the reduction of food supply for species that include fish and invertebrates in their diets. These effects would be considered temporary and would not harm birds and mammals. Most mammal species are relatively resistant to rotenone. A summary of lethal rotenone doses for several species provided by Ling (2003) indicated that the doses required to kill a mammal are typically several orders of magnitude higher than lethal doses for fish. For example, the median lethal oral dose (LD50 oral) for a mouse is 350 mg/kg and for a rabbit is approximately 1.5 g/kg. Rotenone is not easily absorbed in birds and mammals and does not accumulate in the body. The absorption of rotenone in the stomach and intestines is relatively slow and incomplete. Fats and oils in the diet can promote its uptake due to solubility effects. Once absorbed, rotenone is broken down by the liver where less toxic excretable metabolites are produced (Lung 2003). Bradbury (1986) stated that to uptake a lethal dose of 12.5 mg of pure rotenone (or 250 mg of the commonly used 5 percent dust), a small mammal weighing approximately half a pound would have to drink 125 liters (33 gallons) of water treated with a 2 parts per million dosage. He also stated that to cause sub-acute effects such as weight loss or liver damage also requires unrealistically high dosages ingested continuously over a period of several months.

As with mammals, birds are extremely unlikely to be directly affected by the toxic effects of rotenone. Laboratory bioassays have shown that LD50s can range from 113 mg/kg to over 1,100 mg/kg of pure rotenone for the eastern chipping sparrow (nestlings) and pheasants (4 week), respectively. Reported LD50 for chickens was over 270 mg/Kg of pure rotenone. Of the birds tested, the chipping sparrow was the most susceptible to rotenone. A six ounce bird of this species would require 19 mg of pure rotenone, or 384 mg of the 5 percent rotenone used to kill fish for a lethal dose. This bird would have to drink 192 liters of water treated with 2 ppm of rotenone to ingest the lethal dose (Bradbury 1986). Further, Ling (2003) indicated that rotenone poisoning as a result of consuming poisoned fish is highly unlikely. Only those birds which include fish or aquatic invertebrates in their diets could be indirectly affected by the rotenone treatments.

No significant effects are anticipated from the removal of beaver dams. Beavers build lodges (dome-shaped structures built of sticks and mud with a large interior chamber above the water line) or sometimes dig burrows into the banks instead of building a lodge. The removal of the

dams would destroy lodges and could lead to the movement of beaver colonies to nearby areas. If burrows are present, beavers are likely to rebuild the dams in the same location.

4.5 THREATENED, ENDANGERED, AND PROPOSED SPECIES

4.5.1 NO ACTION: DIRECT, INDIRECT, AND CUMULATIVE EFFECTS

The bald eagle and Mexican spotted owl may occur in the Willow Creek drainage. Bonytail, humpback chub, razorback sucker, and Colorado pikeminnow occur in the Green River, downstream of Willow Creek. None of these species would be affected under the No Action Alternative.

4.5.2 PROPOSED ACTION: DIRECT, INDIRECT, AND CUMULATIVE EFFECTS

No direct, indirect or cumulative effects on federally listed species would be anticipated with the implementation of the Proposed Action. None of the federally listed plant, fish, and mammal species with distributions in Grand and Uinta counties are known to occur in the project area.

The bald eagle and Mexican spotted owl are federally listed threatened species that may occur in the project area. Salvage operations for native fishes and rotenone treatments associated with the Proposed Action would be completed over a short period of time and would not be likely to disturb eagle or owl roosting sites that could potentially occur in the vicinity of the treatment area. As described above, no direct toxic effects of rotenone would be anticipated on any bird species present in the project area. Bald eagles could be affected indirectly as they may include fish in their diets. However, these effects would be considered negligible and temporary because eagles could feed on fish killed during the treatment and could use alternative food sources following the treatment.

The four federally listed fish species in Grand and Uinta counties occur in the Green River. As described above, Willow Creek is a tributary of the Green River and its confluence is located 42 miles below the Meadow Creek-Willow Creek confluence, where the detoxification station would be located. The natural breakdown of rotenone coupled with the oxidizing effect of the potassium permanganate that would be applied at the detoxification station would prevent any negative effects on fishes present downstream of the treated areas.

4.6 STATE SENSITIVE SPECIES

4.6.1 NO ACTION: DIRECT, INDIRECT, AND CUMULATIVE EFFECTS

None of the state sensitive species that occur in Willow Creek would be affected under the No Action Alternative. A population of CRCT would not be established under this alternative. Unlike the Proposed Action, this alternative would not lead to and increase in the distribution and abundance of CRCT.

4.6.2 PROPOSED ACTION: DIRECT, INDIRECT, AND CUMULATIVE EFFECTS

The implementation of the Proposed Action would not lead to negative effects on state sensitive fish species. The only two state sensitive species that occur in the Willow Creek drainage are the greater sage-grouse and ferruginous hawk. As described above, bird species would not be sensitive to rotenone at the concentrations used for the removal of fishes. Activities associated with the salvage of native fishes and the rotenone treatment would be limited primarily to the stream channels, banks, and riparian areas. These activities would last only a few days and disturbance of any sensitive bird species that may occur in the area would be negligible. Further, the diets of these species do not depend on aquatic invertebrates or fish and indirect affects would not be anticipated.

The Proposed Action would eliminate non-native fish species in the treated areas allowing the establishment of pure strain populations of CRCT. The successful introduction of this species would represent an increase in their abundance and an expansion of their range. This action would contribute to the long-tern conservation of this species and would be in accordance with the goals and objectives of the CRCT conservation agreement.

4.7 PUBLIC HEALTH AND SAFETY

4.7.1 NO ACTION: DIRECT, INDIRECT, AND CUMULATIVE EFFECTS

Rotenone treatments would not be implemented under this alternative and no direct, indirect, or cumulative effects would occur.

4.7.2 PROPOSED ACTION: DIRECT, INDIRECT, AND CUMULATIVE EFFECTS

No direct, indirect or cumulative effects on public health and safety would be anticipated with the implementation of the Proposed Action. Direct contact with rotenone would be a safety issue only faced by the personnel in charge of the application. The only ways the public could be exposed to rotenone would be by eating fish killed during the treatment or by drinking treated water. Consumption of contaminated water would be unlikely due to the remote location where the treatment would occur and because Willow Creek and its tributaries would not be used as a source of public drinking water. It would also be very unlikely that the treatments would contaminate ground water because rotenone would be rapidly adsorbed, degraded, and detoxified by organic matter in soil (Dawson et al. 1991). Further, as with most mammal species, humans are relatively resistant to rotenone. It would be unlikely that eating fish from treated waters would cause harmful effects on humans (Bradbury 1986). Other potential safety concerns associated with the implementation of the Proposed Action would be minimized by the use of proper safety measures during the transport and application of rotenone as described in Chapter 3.

According to the World Health Organization classification for pesticides, rotenone is classified as toxic class II (i.e., moderately hazardous) or III (i.e., slightly hazardous) based on the established oral toxicity values for rats and other mammals. Estimates of lethal oral doses of pure rotenone for humans have ranged from 0.132 g/kg to 0.5 g/kg (Bradbury 1986). Two of the studies cited by Ling (2003) reported that the acute LD50 oral for humans ranged from 300 to 500 mg/kg. Rotenone poisoning is more likely to result from inhalation rather than ingestion, given that intestinal absorption of water insoluble rotenone is relatively inefficient. Certain solvents mixed with rotenone could increase intestinal absorption and greatly enhance its toxicity.

The use of protective gear and liquid emulsifiable rotenone would prevent applicators to experience potential non-lethal symptoms of rotenone. Non-lethal symptoms such as a numb sensation in the mouth and lips, headache, sore throat, runny nose, and other cold-like symptoms have been reported in humans exposed to rotenone dusts after prolonged occupational exposures (Bradbury 1986; Ling 2003). Conclusive evidence of other non-lethal effects of rotenone has not been documented. No evidence of carcinogenic activity has been found in rats. Betarbet et al (2000) reported the development of symptoms similar to those of Parkinson's disease in rats exposed to rotenone but their conclusions have been criticized because of the methodology used. In their study, rats were infused intravenously with rotenone over a period of 7 days to more than 5 weeks. The rotenone solution used was mixed with solvents that enhance tissue penetration of many chemicals. Borzelleca (2001) and AFS (2006) stated that while this is an acceptable research method, it is not relevant to the potential effects of rotenone in humans because rotenone would enter their system via ingestion or respiration and the gastrointestinal tract prevents rotenone to get into the blood stream.

4.8 OTHER ISSUES

This EA addresses those issues raised by the public or involved agencies, and also assesses potential effects on resources considered likely to be affected. No additional resources not specifically listed in this Final EA would be impacted by the Proposed Action including, but not limited to, grazing or recreation.

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CHAPTER 5: COMPLIANCE WITH OTHER LAWS AND EXECUTIVE ORDERS

This environmental assessment complies with state and federal laws including the Clean Water Act and the Endangered Species Act as discussed below.

5.1 CLEAN WATER ACT

Under the Clean Water Act, each state is required to implement its own water quality standards. Maintenance of water quality to protect the designated Beneficial Uses is required by the State of Utah under its antidegradation policy. As discussed in Chapter 4, no long-term negative effects on water quality are anticipated from the implementation of the Proposed Action or the No Action. Short-term effects would be associated with the toxicity of rotenone to aquatic organisms including invertebrates and fish. The designated Beneficial Uses would be maintained following the implementation of the Proposed Action.

5.2 ENDANGERED SPECIES ACT OF 1973, AS AMENDED

According to the list of federally listed species provided by the USFWS and the discussion of potential effects on these species included in Chapter 4, it has been determined that the implementation of the Proposed Action or the No Action would not lead to any adverse effects to populations of threatened, endangered, or candidate species.

5.3 EXECUTIVE ORDER 13186 - RESPONSIBILITIES OF FEDERAL AGENCIES TO PROTECT MIGRATORY BIRDS

This Executive Order requires Federal Agencies to describe the effects of their actions on migratory birds, with an emphasis on species of concern, in the environmental analyses required by NEPA (this document). Proposed, Threatened and Endangered Species and State of Utah Sensitive Species are described in Chapter 4. No impacts are anticipated on migratory birds under the Proposed Action or the No Action alternative.

5.4 EXECUTIVE ORDER 13112 - INVASIVE SPECIES

This executive order requires Federal Agencies to prevent the introduction of invasive species and to provide for restoration of native species and habitat conditions in ecosystems that have been invaded. The Purpose and Need for the project is to restore native CRCT populations in the Willow Creek drainage by eliminating or minimizing threats from non-native salmonids. The Proposed Action would directly address the objectives of this Executive Order.

5.5 EXECUTIVE ORDER 3215 - INDIAN TRUST ASSETS

Indian trust assets are defined as legal interests in property held in trust by the United States for Indian tribes or individuals, or property that the United States is otherwise charged by law to protect. The United States has a trust responsibility to protect and maintain rights reserved by or granted to American Indians or Indian individuals by treaties, statutes and executive orders. This trust responsibility requires that all Federal agencies take all actions reasonably necessary to protect this trust. The UDWR decision will apply to lands administered by the State Institutional Trust land Administration (SITLA), the UDWR and the Ute Indian Tribe. The involvement of Ute Indian Tribe is crucial to success of the treatment and the Ute Tribe will be included in project implementation.

5.6 EXECUTIVE ORDER 13175 AND SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT - CONSULTATION AND COORDINATION WITH INDIAN TRIBAL GOVERNMENTS

These regulations require Federal Agencies to consult with Indian Tribes regarding potential impacts on sites with religious or cultural significance. The URMCC requested concerns on Tribal and all cultural resources to the Ute Indian Tribe on a letter dated January 27, 2006. No response was received.

Section 106 of the National Historic Preservation Act requires all Federal Agencies to identify the impacts their actions would have on cultural and historical resources. Under the Proposed Action and No Action Alternatives, no ground disturbing activities would take place, either directly on indirectly, and there would be no impacts on cultural or historical resources.

5.7 EXECUTIVE ORDER 12898 - ENVIRONMENTAL JUSTICE

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* of February 11, 1994, requires agencies undertaking Federal projects to identify low-income and minority populations, assess whether adverse human health or environmental impacts would result from the Proposed Action and alternatives, and address the project's public outreach program in relation to environmental justice issues. In accordance with this order, the proposed project has been reviewed to determine if it would result in "...disproportionately high and adverse human health and environmental effects on minorities and low-income populations." Due to the nature of the Proposed Action – i.e., rotenone treatment of a stream network in a remote area that would not affect any existing permanent residence – no residents or businesses would be displaced. Since no development is proposed, there would be no future or long-term impacts that would affect the livability of the surrounding areas. Based on consideration of the potential effects, it was determined that consumers, civil rights, minority groups, or women would be neither significantly impacted nor disproportionately impacted by the proposed project.

5.8 EXECUTIVE ORDER 13352 - FACILITATION OF COOPERATIVE CONSERVATION

This Executive Order requires Federal Agencies to provide State and local entities an opportunity to provide meaningful comment and consideration on Federal Actions. In accordance with Executive Order 13352, input is being solicited from State and local entities on the proposed project.

5.9 WILDERNESS ACT OF 1964 AND WILD AND SCENIC RIVERS ACT

The Project Area is not within proposed or designated Wilderness Areas or Wild or Scenic Rivers. Therefore, no impacts would occur to proposed or designated Wilderness Areas or Wild or Scenic Rivers.

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CHAPTER 6: LIST OF PREPARERS

The following individuals assisted in the preparation if this document or provided technical support:

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GIS/Environmental Planner

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Wildlife Biologist

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Admin/Document Production

The following individuals reviewed an earlier draft of this document:

Utah Division of Wildlife Resources

Eric Larson, Aquatic Habitat/CUP Coordinator

Garn Birchell

Utah Reclamation Mitigation and Conservation Commission

Maureen Wilson, Project Coordinator

Richard Mingo

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CHAPTER 7: RESPONSES TO COMMENTS ON THE DRAFT EA

A single comment letter was received from the Uintah County Commission on the Draft EA for the Rotenone treatments in the Willow Creek Drainage, Grand and Uintah Counties, Utah. A copy of this letter is included in this chapter. Comments requiring a specific response are presented here in a comment and response format.

1. Comment: The draft does not indicate any attempt to address the proposal's consistency with local Public Land Policy or Plans. The draft does not indicate any attempt to reconcile the proposal with any existing Public Land Resource Management Plans (BLM).

Uintah County's Public Lands Policy on Page 15 (top), provides that, "in evaluating a proposed introduction of a wildlife species, priority will be given to species that will provide for increased recreational activities". The EA fails to address the impacts of the proposal on recreational opportunities, present and future.

Uintah County's Public Lands Implementation Plan on Page 6, sixth paragraph, last sentence provides, "such proposals must not be approved unless the analysis supported by verifiable scientific data shows that both the quality and quantity of the required habitat exist to ensure success of the proposed action".

Response: The Proposed Action is not inconsistent with the Uintah County Public Lands Policy, Grand County policies or the U.S. Bureau of Land Management (BLM) Resource Management Plan for the affected area. Text in Section 1.3 has been modified to reflect this.

The proposed rotenone treatment and subsequent introduction of Colorado River cutthroat trout (CRCT) is in agreement with the BLM's Vernal Field Office Resource Management Plan (RMP). This RMP provides planning guidance for public land and federal mineral estate managed by the Vernal Field Office in Daggett, Duchesne, Uintah Counties and a small portion of Grand County. CRCT is among the sensitive species for which this management plan includes specific management prescriptions. Prescriptions for CRCT would provide, maintain, and/or enhance habitat for the reintroductions of Colorado River cutthroat trout to several streams. Further, consultation and scoping with the BLM, a signatory to the Cutthroat Trout Conservation Agreement and Strategy, and the State of Utah Resource Development Coordinating Committee did take place. Consultation was also initiated through the scoping process with both Uintah and Grand Counties, in December, 2005. No responses were received during scoping, and no additional issues with policies were identified through these processes.

No significant change in recreational opportunities and use is anticipated from this action. The text in Section 2.2.1, Proposed Action has been modified to reflect this.

Stream habitat and trout populations were assessed in 2004 by the Division as part of the preparation of the rotenone treatment plan for the Willow Creek drainage. These were referenced in the 4th paragraph of Section 2.2.1. Results of these assessments have been added to that section of the text. Trout and adequate habitat were present only in West Willow Creek and Steer Gulch and Pioche Creeks.

It was estimated that only the West Willow Creek drainage provides adequate habitat for CRCT restoration and comprises the project area. Rotenone treatment of West Willow Creek to remove nonnative trout will result in approximately 28 miles of stream habitat for CRCT introduction.

2. Comment: The EA fails to properly address the existence of water quality to support the success of the proposals to reestablish CRCT in the subject drainages. The only attempt to address this issue is on Page 15 @ 3.1.2. Here is an attempt to address historically poor water quality in the subject area with a study that is six years old.

Response: See response above to Comment #1. Stream habitat and trout populations upstream of the Meadow Creek confluence were assessed in 2004 by the Division as part of the preparation of the rotenone treatment plan for the Willow Creek drainage. Where other trout species were found to be supported in these tributaries, CRCT are expected to become established as well, particularly with the habitat and flow improvements seen with the land use changes. Those tributaries with no fish and poor habitat will not be treated or stocked with CRCT under this effort.

3. Comment: Chapter 4 on Page 25 @ 4.1 addressing impacts to farmlands. The EA fails to address impacts on grazing in the area, present and future. As an example, will there be further attempts to produce [*sic*] livestock numbers in the area to meet water quality needs?

Response: As stated above in the response to comment #1, most of the uplands in the project area are managed by the State Institutional Trust Land Administration (SITLA). Remaining lands are managed by the Ute Indian Tribe and the Division. The Division currently leases grazing rights in the project area from SITLA. The Division does not currently exercise those rights nor is livestock grazing allowed on lands held by the Division in fee. No changes in grazing management are planned for those parcels with or without implementation of the proposed project. Section 4.1.2 of the Final EA, has been revised to reflect no impacts to grazing are expected from the Proposed Action.

4. Comment: The title of this EA and the description of the proposed action mask the fact that the proposed action is the reintroduction of CRCT to Willow Creek drainages. The EA addresses the impacts of the use of the Rotenone Treatments, but fails to fully analyze the reintroduction of CRCT. In addition to impacts not addressed listed above, there is no analysis of the implications of changing a fishery from multi species to a single species fishery. Susceptibility to this single species fishery to disease, changes in water temperature and flow should be addressed.

Response: The Proposed Action (see Section 2.2.1, Page 7) does include the stocking of CRCT. It was not the Commission's or the Division's intent to mask the reintroduction of the CRCT as a result of the rotenone treatment. No significant environmental impacts or land use change are expected as a result of the restocking of CRCT in the project area streams. We do not suspect that CRCT are any more susceptible to disease, changes in water temperature or flow than the existing trout species.

Scoping for the project was completed during December 2005. The Proposed Action description in the scoping notice included the stocking of the CRCT in the treated streams.

UINTAH COUNTY

STATE OF UTAH

Our past is the nation's future

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COMMISSIONERS:
David J. Haslem
Jim Abegglen
Michael J. McKee
ASSESSOR - Gayla Casper
ATTORNEY - JoAnn Stringham
CLERK-AUDITOR - Michael W. Wilkins
RECORDER - Randy J. Simmons
TREASURER - Donna Richens
SHERIFF - Rick Hawkins
SURVEYOR - Robert Kay

July 25, 2006

Maureen Wilson
Mitigation Commission
102 West 500 South
Salt Lake City, Utah 84101

RE: Draft EA for the Rotenone Treatments in Willow Creek Drainage, Grand and Uintah Counties

Dear Ms Wilson,

Thank you for the opportunity to comment on the Draft Environmental Assessment for the Rotenone Treatments in Willow Creek Drainage in Uintah County.

The following comments were developed based on the County's review of the draft.

Consistency

The draft does not indicate any attempt to address the proposals consistency with local Public Land Policy or Plans. The draft does not indicate any attempt to reconcile the proposal with any existing Public Land Resource Management Plans (BLM).

Uintah County's Public Lands Policy on Page 15 (top), provides that "in evaluating a proposed introduction of a wildlife species, priority will be given to species that will provide for increased recreational activities". The EA fails to address the impacts of the proposal on recreational opportunities present and future.

Uintah County's Public Lands Implementation Plan on Page 6, sixth paragraph, last sentence provides "such proposals must not be approved unless the analysis supported by verifiable scientific data shows that both the quality and quantity of the required habitat exist to ensure success of the proposed action".

The EA fails to properly address the existence of water quality to support the success of the proposals to reestablish CRCT in the subject drainages. The only attempt to address this issue is on Page 15 @ 3.1.2. Here is an attempt to address historically poor water quality in the subject area with a study that is six years old.

Chapter 4 on Page 25 @ 4.1 addressing impacts to farmlands. The EA fails to address impacts on grazing in the area, present and future. As an example, will there be further attempts to produce livestock numbers in the area to meet water quality needs?

The title of this EA and the description of the proposed action mask the fact that the proposed action is the reintroduction of CRCT to Willow Creek drainages. The EA addresses the impacts of the use of the Rotenone Treatments, but fails to fully analyze the reintroduction of CRCT. In addition to impacts not addressed listed above, there is no analysis of the implications of changing a fishery from multi species to a single species fishery. Susceptibility to this single species fishery to disease, changes in water temperature and flow should be addressed.

If you have any questions please contact Darlene Burns at 435-781-5483.

Sincerely,

UINTAH COUNTY COMMISSION

Michael J. McKee

Michael J. McKee, Chairman

David J. Haslem

Absent

Jim Abegglen

REFERENCES

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APPENDIX: LIST OF AGENCIES AND PERSONS CONSULTED

First Name	Last Name	Organization
Henn	Gruenthal	
Peter	Hovingh	
Marilyn	Dinger	
		Anglers Inn
Don	Wiley	Bonneville Chapter
Dennis	Shiozawa	Brigham Young University
Jason	Swan	Cache Anglers
Kerry	Flood	Castle Country Anglers
Don	Christiansen	Central Utah Water Conservancy District
John	Bissonette	Coop Fish & Wildlife Research Unit
Cary	Peterson	Department of Agriculture and Food
Robert	Morgan	Department of Natural Resources
Ralph	Swanson	Department of the Interior
		Deseret News
Paul	Freisma	Environmental Policy Program IPR
Karen	Mock	Fish & Wildlife Dept
Dick	Buehler	Forestry Fire and State Lands
John	Harja	Governors Office of Planning and Budget
Carolyn	Wright	Governors Office of Planning and Budget
		Grand County Council
Ray	Smith	Great Salt Lake Audubon
Joe	Young	High Country Fly Fishers
John	Schultz	High Country Fly Fishers
Dick	Carter	High Uintas Preservation Council
Brad	Cutler	Rocky Mountain Anglers
		Roosevelt City Corporation
Dan	Potts	Salt Lake Co Fish & Game
		Salt Lake Tribune
Ron	Dean	Senator Orrin Hatch
Brad	Shafer	Senator Robert Bennett
Utah	Chapter	Sierra Club
Steve	Bloch	Southern Utah Wilderness Alliance
		Sportsman's Warehouse
Don	Peay	Sportsmen for Fish Wildlife and Habitat
Rich	Messineo	Stonefly Society Chapter
		The Nature Conservancy
		The Sun Advocate
		The Times Independent
		The Uintah Basin Standard
Paul	Dremann	Trout Unlimited

First Name	Last Name	Organization
Bill	Partner	Trout Unlimited
		Uinta Mountain Club
Curtis	Dastrup	Uintah Basin Association of Governments
		Uintah Basin Standard
		Uintah County Commission
Lynn	Hansen	US Bureau of Indian Affairs
Chester	Mills	US Bureau of Indian Affairs
Gary	Cantley	US Bureau of Indian Affairs
		US Bureau of Land Management
		US Bureau of Land Management
Tom	Chart	US Bureau of Reclamation
Bruce	Barrett	US Bureau of Reclamation
Dave	Ruiter	US EPA -8EPR-EP
Mike	Reed	US EPA -8P-W-P
Maple Annette	Barnard	US EPA Tribal Assistance Program
Cindy	Cody	US EPA-NEPA Unit -EPR-N
Henry	Maddux	US Fish & Wildlife Service
Bob	McCue	US Fish & Wildlife Service
Dave	Irving	US Fish & Wildlife Service
		US Fish & Wildlife Service
Mike	Stempel	US Fish & Wildlife Service
David	Redhorse	US Fish & Wildlife Service
Dan	Duffield	US Forest Service
Barry	Tripp	UT Division of Forestry, Fire and State Lands
Jim	Matheson	Utah 2nd Congressional District
Wesley	Peterson	Utah Association of Conservation Districts
Mark	Martin	Utah Department of Agriculture and Food
		Utah Department of Environmental Quality
Judy	Watanabe	Utah Department of Public Safety
Carlos	Braceros	Utah Department of Transportation
James	Dykmann	Utah Division of State History
Don	Ostler	Utah Division of Water Quality
Mike	Reichert	Utah Division of Water Quality
Larry	Anderson	Utah Division of Water Resources
Jerry	Olds	Utah Division of Water Rights
Robert	Leake	Utah Division of Water Rights
Kevin	Conway	Utah Division of Wildlife Resources
Tom	Pettengill	Utah Division of Wildlife Resources
Randy	Radant	Utah Division of Wildlife Resources
		Utah Division of Wildlife Resources
Rick	Larson	Utah Division of Wildlife Resources
		Utah Farm Bureau Federation
Brad.	King	Utah House of Representatives
John G.	Mathis	Utah House of Representatives
Forrest	Cuch	Utah Office of Indian Affairs
		Utah Rivers Council
Beverly Ann	Evans	Utah Senate

First Name	Last Name	Organization
Mike	Dmitrich	Utah Senate
Joanna	Endter-Wada	Utah State University
Rich	Etchberger	Utah State University
Jerrod	Fillerup	Utah Valley Flyrodders
John	Clements	Utah Valley Flyrodders
Darrell	Mensel	Utah Waters
		Utah Wildlife Federation
Max	Adams	Ute Economic Development
Eddie	Kurip	Ute Tribe Air Quality
Maxine	Natchess	Ute Tribe Business Committee
Betsy	Chapoose	Ute Tribe Cultural Rights and Protection Program
Elaine	Willie	Ute Tribe Environmental Coordinator
Everett	Manning	Ute Tribe Fish & Wildlife Dept
		Ute Tribe Natural Resources
Larry	Cesspooch	Ute Tribe Public Relations
		Vernal Express
Wes	Johnson	Weber Basin Anglers