RECLAMATION

Managing Water in the West

Red Fleet Reservoir Rotenone Treatment Draft Environmental Assessment

PRO-EA-15-006

Central Utah Project
Uintah County, Utah
Provo Area Office

U.S. Department of the Interior
Bureau of Reclamation
Provo Area Office
Provo, Utah

June 2015

Mission Statements

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Red Fleet Reservoir Rotenone Treatment Environmental Assessment

PRO-EA-15-006

Central Utah Project
Uintah County, Utah
Upper Colorado Region
Provo Area Office

prepared by *Peter L. Crookston*
Bureau of Reclamation
Provo Area Office
302 East 1860 South
Provo, Utah 84606

U.S. Department of the Interior
Bureau of Reclamation
Provo Area Office
Provo, Utah

June 2015

Contents

Page

Chapter 1 Need for Proposed Action and Background 1
1.1 Introduction 1
1.1.1 Overview 1
1.2 Background 1
1.3 Purpose, Need, and Scope of Analysis 3
1.4 Summary of Scoping Issues 4
1.5 Permits, Licenses, and Authorizations 4
1.6 Document Organization 5
Chapter 2 Proposed Action and No Action Alternative 6
2.1 Introduction 6
2.2 No Action Alternative 6
2.3 Proposed Action 6
2.3.1 Methodology 7
2.3.1.1 Pre-treatment 7
2.3.1.2 Treatment 7
2.3.1.3 Post-treatment 8
Chapter 3 Affected Environment and Environmental Consequences 9
3.1 Introduction 9
3.2 Affected Environment 9
3.2.1 Recreation 9
3.2.2 Water Resources 9
3.2.3 Water Quality 10
3.2.3.2 Limnological Assessment 12
3.2.3.3 Pollution Assessment 13
3.2.3.4 Beneficial Use Classifications for Red Fleet Reservoir 13
3.2.3.5 Beneficial Use Impairments for Red Fleet Reservoir 14
3.2.4 System Operations 14
3.2.5 Public Safety, Access, and Transportation 16
3.2.6 Visual Resources 17
3.2.7 Socioeconomics 17
3.2.8 Wetlands and Vegetation 17
3.2.9 Fish and Wildlife Resources 18
3.2.9.1 Fish 18
3.2.9.2 Birds 19
3.2.9.3 Wildlife 20
3.2.10 Threatened, Endangered, and Sensitive Species 21
3.2.10.1 Plants 21

3.2.10.2 Fish and Wildlife 22
3.3 Environmental Effects of Alternatives 23
3.3.1 Recreation 23
3.3.1.1 No Action Alternative 23
3.3.1.2 Proposed Action 23
3.3.2 Water Resources 24
3.3.2.1 No Action Alternative 24
3.3.2.2 Proposed Action 24
3.3.3 Water Quality 24
3.3.3.1 No Action Alternative 24
3.3.3.2 Proposed Action – Direct and Indirect Effects 24
3.3.4 System Operations 27
3.3.4.1 No Action Alternative 27
3.3.4.2 Proposed Action 27
3.3.5 Public Safety, Access, and Transportation 27
3.3.5.1 No Action Alternative 27
3.3.5.2 Proposed Action 27
3.3.5.2.1 Site Security 27
3.3.5.2.2 Fish Disposal After Treatment 28
3.3.5.2.3 Spill Contingency 28
3.3.6 Visual Resources 28
3.3.6.1 No Action Alternative 28
3.3.6.2 Proposed Action 28
3.3.7 Socioeconomics 28
3.3.7.1 No Action Alternative 28
3.3.7.2 Proposed Action 29
3.3.8 Wetlands and Vegetation 29
3.3.8.1 No Action Alternative 29
3.3.8.2 Proposed Action 29
3.3.9 Fish and Wildlife Resources 30
3.3.9.1 No Action Alternative 30
3.3.9.2 Proposed Action 30
3.3.9.2.1 Fish 30
3.3.9.2.2 Birds 30
3.3.9.2.3 Wildlife 31
3.3.10 Threatened, Endangered, Candidate, Proposed, and Sensitive Species 31
3.3.10.1 No Action Alternative 31
3.3.10.2 Proposed Action 31
3.3.10.2.1 Plants 31
3.3.10.2.2 Fish and Wildlife 31
3.4 Summary of Environmental Effects 32
3.5 Indian Trust Assets 32
3.6 Environmental Justice 33
3.7 Cumulative Effects 33
Chapter 4 Environmental Commitments 34

Chapter 5 Consultation and Coordination 36
5.1 Introduction 36
5.2 Public Involvement 36
Chapter 6 Preparers 38
Chapter 7 References 39

Appendix A Angler Survey Responses
Appendix B Scoping Responses
Appendix C Comment Letter

Chapter 1 Need for Proposed Action and Background

1.1 Introduction

The Bureau of Reclamation, Provo Area Office has prepared an Environmental Assessment (EA) under the National Environmental Policy Act of 1969 (NEPA), Public Law 91-90, as amended, the Council on Environmental Quality, and Department of the Interior regulations implementing NEPA. This EA analyzes the potential effects of the Proposed Action, which would treat Red Fleet Reservoir with rotenone to remove unwanted fish in order to protect endangered fish species of the Green River. In comparison, under the No Action Alternative, the fishery would remain unchanged and would not be treated.

1.1.1 Overview

The Utah Department of Natural Resources, Division of Wildlife Resources (UDWR) is proposing to treat Red Fleet Reservoir with rotenone to eradicate illegally introduced fish species, specifically Walleye and Smallmouth Bass. The treatment would be reservoir wide and would include a drip station immediately above the inflow on Big Brush Creek, and a detoxification (detox) station immediately below the outlet of the dam and also on Big Brush Creek. There would be no change in reservoir operations and no ground disturbance associated with the Proposed Action.

This EA analyzes the potential impacts of treating the reservoir. If potentially significant impacts to the human environment are identified, a Notice of Intent to prepare an Environmental Impact Statement (EIS) would be published in the Federal Register and an EIS would be prepared. If no significant impacts are identified, Reclamation would issue a Finding of No Significant Impact (FONSI).

1.2 Background

Red Fleet Reservoir is an impoundment of Big Brush Creek, located 10 miles north of Vernal, Utah, in Uintah County (Figure 1). Red Fleet is an irrigation storage reservoir that sits at an elevation of 5,608 feet at full pool. The reservoir is 521 surface acres and holds 26,015 acre-feet (AF) of water when full. Red Fleet began to store water in 1980 and reached full capacity in 1983.

Red Fleet Reservoir management is focused on family-oriented recreation and the fishery is managed to produce and grow fish to an acceptable size (10 inches and larger).

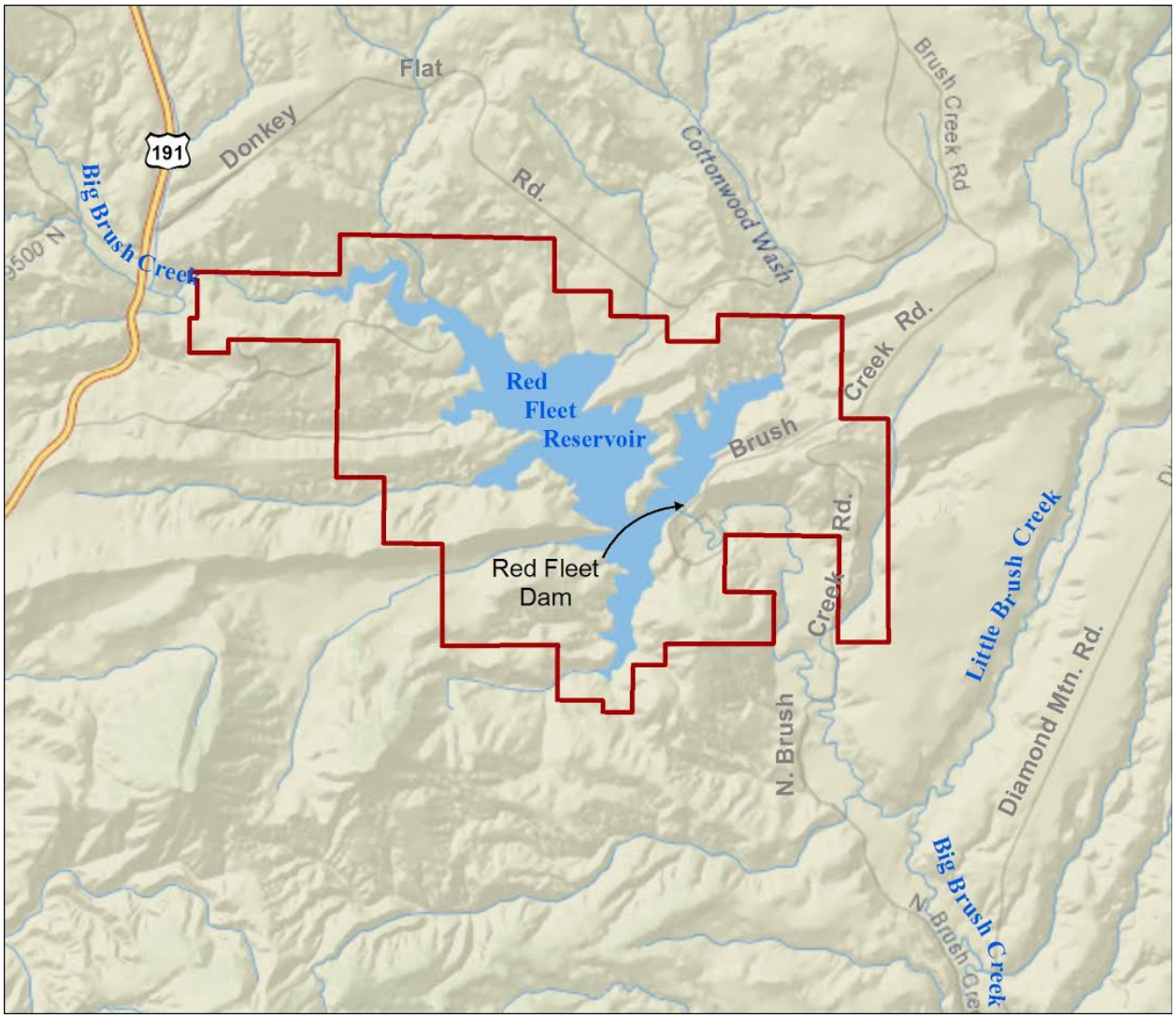

Figure 1. Red Fleet Reservoir and State Park

Historically, Red Fleet was stocked predominantly with fingerling Rainbow Trout (*Oncorhynchus mykiss*); however, the size was increased to 5 inches long in 1987, due to predation from Largemouth Bass (*Micropterus salmoides*) that were illegally introduced sometime during the 1980's (Ottenbacher 1986). Stocking rates have varied from 78 to 185 Rainbow Trout per acre per year, but are generally fewer in number as stocking size increases. Red Fleet has been open to year-round fishing since January 1985.

This Red Fleet fishery also contains other species of fish such as native Flannelmouth Sucker (*Catostomus latipinnis),* Mountain Sucker (*Catostomus platyrhinchus),* and non-native Brown Trout (*Salmo trutta*), that occur naturally in Brush Creek and Bluegill (*Lepomis macrochirus)* which were also illegally introduced. In 2002, Walleye (*Sander vitreus*) were first detected in the annual gillnetting conducted by the UDWR and have subsequently become established, with detection in greater numbers and multiple size classes since the 2006

gillnetting. In addition to Walleye increasing in numbers, Smallmouth Bass, which have been present in the reservoir in low numbers resulting from an illegal introduction in the 1980's, have slowly but steadily been increasing in numbers as well.

The UDWR is proposing a rotenone treatment for Red Fleet Reservoir October 2015. Proposed treatment of the reservoir would be accomplished under current safety standards without affecting dam operations and the purposes of the Central Utah Project, which are: to provide water for Municipal and Industrial (M&I) and agricultural water use, fish and wildlife habitat, and flood control.

1.3 Purpose, Need, and Scope of Analysis

Illegal introductions are a problem for fisheries managers across the United States. Bucket Bait transfers and movement of sportfish captured by anglers between waters can move diseases, unwanted invertebrates, and unwanted plants, and have disastrous impacts to native biota and ecosystems (Elton [1958], Laycock [1966], Minckley and Deacon [1968], Moyle [1976], Taylor et al. [1984], Courtenay and Robins [1989], Minckley [1991], Courtenay [1993], and Canonico et al. [2005]). Illegal transfers of fish can have detrimental impacts to the sport fishery, as additional species can increase competition and predation. They can also negatively affect native fisheries upstream or downstream upon escapement from the reservoir.

Walleye were originally stocked into Starvation Reservoir by the UDWR to help control the Utah chub (Gila atraria) population. Walleye grow quickly and can become piscivorous (fish eating fish) at six to eight inches long (Smith and Pycha 1960; Mathias and Li 1982; Knight et al. 1983; Kolar et al. 2003). Because of their voracious appetites, they can cause year-class failure of prey species (Knight et al. 1983; Lyons and Magnuson 1987) and potentially affect other predatory species via competition for prey species, if their population is able to proliferate (Fayrum et al. 2005).

Walleye were first detected in Red Fleet Reservoir in 2002. Since then, Walleye have impacted the UDWR's Rainbow Trout stocking program requiring managers to stock larger trout, meaning a 75 percent reduction in the quota from 2002 to keep costs the same. Other species in the reservoir include Bluegill, Largemouth Bass, Smallmouth Bass, and Brown Trout. Walleye have been observed preying upon all species in the Red Fleet, but predominantly young-of-year Largemouth Bass (Boren 2012) indicating that an increase in the Walleye population could influence other popular fisheries in the reservoir over time.

The Green River, below Red Fleet Reservoir, is designated as critical habitat for three of the four endangered Colorado River endangered fish, the Colorado Pikeminnow (Ptychocheilus lucius), the Razorback Sucker (Xyrauchen texanus), and the Bonytail (Gila elegans). Red Fleet Reservoir is not the main source of

Walleye in the Green River; however, fish have escaped through the outlet works from Red Fleet Reservoir as young-of-year or age-1. The Upper Colorado River Endangered Fish Recovery Program (Program), of which the Utah Department of Natural Resources (parent agency of the UDWR) is a signatory, has determined that the level of escapement is too great and must be addressed to protect the endangered fish.

Water from Red Fleet Reservoir, flows downstream approximately 14 miles to the confluence with the Green River. Fish from Red Fleet can escape through the outlet works of the reservoir and make it downstream to the Green River where they can interact with the native endangered species. Depending on the species, the interaction can vary from predation to competition, but will generally be a negative interaction due to limited resources in the Green River. It is this potential for negative interactions with the native endangered fish, in addition to Walleye in Red Fleet, which is triggering the need for the Proposed Action.

1.4 Summary of Scoping Issues

Issues raised during the spring 2013 and spring 2015 scoping were similar. Comments included concern for the fishery, mainly either wanting Walleye to remain, or wanting Walleye removed; concern for application of rotenone in a drinking water source; fears of a post-treatment illegal introduction ruining our efforts; and not wanting a return of a Rainbow Trout only fishery post-treatment. Additional comments were generally a lack of support for spending money on a rotenone treatment at Red Fleet Reservoir, and a lack of confidence in the UDWR to provide a good fishery post-treatment.

In 2014, a UDWR sponsored angler survey was completed by over 300 individuals. The survey results showed that a rotenone treatment in Red Fleet Reservoir would be an unpopular action (refer to Appendix A for all angler survey responses). An outreach effort has begun to help the public understand this action and the proposed treatment.

1.5 Permits, Licenses, and Authorizations

Implementation of the Proposed Action may or may not require a number of permits or authorizations from state and Federal agencies. They are summarized below.

- Utah Pollution Discharge Elimination System (UPDES) Pesticide General Permit. This permit authorizes the point source discharge of pesticides into waters of the state of Utah. This permit would be obtained by the UDWR from the Utah Department of Environmental Quality (UDEQ), and complies with Section 402 of the Clean Water Act (CWA) for actions involving the discharge of pollutants into waters of the state of Utah.

- Section 7 Consultation - Consultation pursuant to Section 7 of the Endangered Species Act (ESA) with the United States Fish and Wildlife Service (USFWS).

1.6 Document Organization

This EA consists of the following chapters:

1. Need for Proposed Action and Background
2. Proposed Action and No Action Alternative
3. Affected Environment and Environmental Consequences
4. Environmental Commitments
5. Consultation and Coordination
6. Preparers
7. References

Appendix A Angler Survey Responses
Appendix B Scoping Responses
Appendix C Comment Letter

Chapter 2 Proposed Action and No Action Alternative

2.1 Introduction

The purpose of the Proposed Action is to eliminate Walleye and other unwanted sport fish from Red Fleet Reservoir. A rotenone treatment and reset of the fishery, coupled with the eventual construction of a fish barrier (not part of this Proposed Action) will eliminate the possibility that these unwanted fish would prey on or compete with the endangered fish species in the Green River, thereby assisting in the recovery effort. This EA analyzes the potential effects to the human environment from the Proposed Action and will serve, along with other pertinent information, to guide Reclamation's decision regarding implementation of the Proposed Action.

The Proposed Action Alternative is analyzed in this EA, along with a No Action Alternative, to facilitate comparison of potential effects between the two.

2.2 No Action Alternative

The No Action Alternative would not change the fishery. Current conditions and threats would continue.

2.3 Proposed Action

The Proposed Action, which is the preferred alternative, is to treat Red Fleet Reservoir with powdered rotenone at 1ppm to eradicate illegally introduced fish species, specifically Walleye and Smallmouth Bass. The treatment would be reservoir wide and would include a drip station immediately above the inflow on Big Brush Creek and a detoxification (detox) station using potassium permanganate ($KMnO_4$) immediately below the outlet of the dam, also on Big Brush Creek. The detox station will be run until sentinel fish immediately above the detox station remain alive for 4 hours as recommended in the AFS SOPs (Finlayson et al. 2010). There will be no ground disturbance and change in dam operations associated with the Proposed Action.

2.3.1 Methodology

2.3.1.1 Pre-treatment

UDWR managers and biologists worked with a group of 12 anglers to finalize the Management Plan for the reservoir. The group's desired fish include sterile Walleye, Wipers, Tiger Trout, Colorado River Cutthroat Trout, Yellow Perch, Black Crappie, and Mountain Whitefish. The UDWR currently has adequate numbers of sterile Walleye and Rainbow Trout for stocking post-treatment in November 2015, and is working on plans to allow transfer of Yellow Perch from Fish Lake to Red Fleet overwinter. If these plans fall through, UDWR may not be able to proceed with the effort this year; however, given the ability to get all the desired fish by the desired times, the treatment will occur in October 2015.

Preparation for the treatment has begun, although nothing can be finalized until UDWR knows inflow rates, outflow rates, and the volume of water in the reservoir at the time of the treatment. Boats and personnel required range from eight boats, each with two operators, for 17,000 AF volume, to two boats, also with two operators, for as little as 4000 AF volume. In addition, one person would operate the drip station on Big Brush Creek, another individual on the detoxification station, a law enforcement officer to help keep the public away from the project area, one individual as the main point of contact for all personnel, and potentially one or two people for transferring native species immediately upstream or downstream of the treatment area. Most probable native species include Flannelmouth Sucker and Mountain Sucker.

Rotenone will be delivered directly to Red Fleet State Park and kept in a locked storage facility until the treatment date. Two weeks before the treatment, bioassays will be completed on each batch of rotenone. One week before treatment, inflows on Big Brush Creek will be measured and the volume of Red Fleet will be obtained from the Uintah Water Conservancy District. In addition, outflows will be verified and the necessary quantity of $KMnO_4$ will be calculated. One day before the treatment, these numbers will be verified to ensure that rotenone and $KMnO_4$ amounts are still appropriate.

2.3.1.2 Treatment

Application of rotenone will occur in one day. The project is currently scheduled for October 6, 2015. The manufacturer will deliver rotenone directly to Red Fleet State Park and UDWR personnel will deliver all equipment and $KMnO_4$ to the state park on October 1 and 5. Treatment will begin at 9 o'clock and will continue until all powdered rotenone (7,351 pounds up to 31,243 pounds) is applied, which is expected to be completed in 9 hours.

Work boats, including jon boats, v-hull boats, and modified v-hull boats (all equipped with outboards) will be used. Tyvek suits and breathe-easy respirators will be worn by all boat operators and powder applicators. All rotenone applicators would have to possess a valid State of Utah Pesticide Applicators Permit (general and aquatics).

Dispersal of powdered rotenone would start at the same time as the drip station on Big Brush Creek. Also, the detoxification station would be set up on October 5 and would start upon initiation of rotenone dispersal. The detox station is anticipated to be located on the bridge below the outlet releases and would be within a locked gate. The detox station would continue to operate until hatchery sentinel fish (sterile rainbow trout) placed immediately above the detoxification station survive for 4 hours.

2.3.1.3 Post-treatment

After the completion of the treatment and detoxification, Red Fleet Reservoir will be immediately restocked with at least two of the desired fish species. Catchable Rainbow Trout are available, and sterile Walleye are also available for stocking and should be six to eight inches by the stock date in late October. The remaining desired species will be stocked starting in 2016, and the longevity of the stocking program is dependent on whether they are a predator or prey species. For the predator species, Fingerling Wiper, sterile Walleye and Tiger Trout will be part of the reservoir's regular quota and will be stocked in summer each year. For prey items, Yellow Perch will be transferred overwinter 2015-2016 from Fish Lake and likely every year for three years to get them established. Mountain Whitefish and Fathead Minnow will be transferred during the summer of 2016, and the next two summers, also to get them established. Black Crappie will be purchased from out of state and stocked during the summer of 2016, 2017, and 2018, also in an attempt to get them established in the reservoir. Annual monitoring for zooplankton and fish species would occur each year for three years to document re-establishment, reproduction, and persistence of desired species. The stocking request will be reviewed after three years to determine whether any species have been unsuccessful and should no longer be stocked into the reservoir. Sampling after that will likely continue to be done annually, just not as intensively once UDWR have information on the success of the species stocked.

Chapter 3 Affected Environment and Environmental Consequences

3.1 Introduction

This chapter describes the resources of the human environment that could be affected by the Proposed Action or No Action Alternatives and the predicted impacts of the actions. These impacts are discussed under the following resource issues: recreation; water resources; water quality; system operations; public safety, access, and transportation; visual resources; socioeconomics; wetlands and vegetation; fish and wildlife resources; and threatened, endangered, and sensitive species. A no effect determination was made for both cultural and paleontological resources because no surface disturbing activities would occur. The present condition or characteristics of each resource is discussed first, followed by a discussion of the predicted impacts under the No Action and Proposed Action Alternatives. The environmental effects are summarized in Table 2.

3.2 Affected Environment

3.2.1 Recreation

Red Fleet State Park was opened to the public in 1988 and is managed through a Memorandum of Agreement between Reclamation and State Parks and subsequent agreements. The agreements obligate State Parks to administer recreation and to operate, maintain, and replace recreational facilities. Water-based activities, such as swimming, waterskiing, pleasure boating, and fishing are the prominent attractions at Red Fleet Reservoir. Other activities include sunbathing, picnicking, camping, sightseeing, hiking, and biking. The park has averaged 32,546 visitors annually between the years 2003 to 2014 and has an average of 924 visitors during the month of October.

3.2.2 Water Resources

The Jensen Unit of the Central Utah Project, located in Uintah County in northeastern Utah, serves Ashley Valley and the area extending east of the valley to the Green River. Red Fleet Dam and Reservoir, located on Big Brush Creek, is the primary feature of the Project and stores early spring runoff and surplus flows for irrigation, M&I water, fish and wildlife, recreation, and flood control. This multipurpose project develops about 22,600 AF of water annually: 18,000 AF for M&I uses and 4,600 AF for irrigation. Some 440 irrigable acres receive a full service water supply and 3,640 AF receive a supplemental water supply.

Demand for irrigation water is met by making releases from the dam to Big Brush Creek. Tyzack Pumping Plant, located near the downstream toe of the dam, meets the demands for M&I water when the supply from Ashley Springs is not potable, by pumping water from Red Fleet Reservoir through Tyzack Aqueduct Reach 1 to the Ashley Valley Water Treatment Plant. As demands for M&I water increase, the reservoir water is made available to meet the demand. The average annual amount of water pumped is 18,000 AF. Tyzack Aqueduct Reach 2 and Reach 3 distribute water treated at the Ashley Valley Water Treatment Plant to Vernal City, Jensen, Maeser, and the Ashley Valley Water and Sewer Improvement District.

3.2.3 Water Quality

The large, natural watershed originates above Oaks Park Reservoir in the Uinta Mountains. This is an area of heavily forested mountains, with the Precambrian rocks underlying the soil. As Big Brush Creek flows down from Oaks Park, it reaches younger softer sedimentary rocks, into which it has eroded a deep gorge. The creek disappears into the bedrock at one point, reappearing as numerous springs lower in the watershed. Little Brush Creek also flows into Big Brush Gorge by the same means. The deepest portion of the gorge is the near vertical walled section in Weber Sandstone. The gorge ends near the entrance to the Simplot phosphate mine at the US-191 crossing of Big Brush Creek, then slices through the strike valleys where Red Fleet Reservoir impounds the stream. The drainage also includes segments of the strike valleys east and west of the reservoir.

The watershed high point, Trout Peak, two miles east of Trout Creek Peak, is 3,240 m (10,629 feet) above sea level, thereby developing a complex slope of 4.8 percent to the reservoir. The average stream gradient in the Big Brush Creek is 3.8 percent (201 feet per mile). The outflow is Big Brush Creek, but a pumping station immediately below the dam transfers water into a pipeline to Ashley Creek, providing irrigation and culinary water to Ashley Valley. The watershed is made up of high mountains, foothills, plateaus, badlands and valleys. The soil associations that compose the watershed have not been determined by the Utah Division of Water Quality (UDWQ). The vegetation communities consist of pine, spruce fir, oak-maple, pinyon-juniper, saltbrush, shadscale, greasewood and sagebrush-grass. The watershed receives 25 to 64 cm (10 to 25 inches) of precipitation annually. The frost-free season around the reservoir is 120 to 140 days per year. Land use is private grazing land at lower elevations, multiple use on U.S. Forest Service and Bureau of Land Management land, and intensive recreation in the area immediately around the reservoir and at Oaks Park Reservoir. The Simplot phosphate mine occupies several square miles immediately above the reservoir.

The reservoir lies within the Uinta Basin Watershed Assessment Unit (UT-L-14060002-006). The reservoir is within the Ashley-Brush Watershed identified with 4th order (8-digit) Hydrologic Unit Code (HUC) – 14060002. Within the Ashley-Brush Watershed, Red Fleet Reservoir is situated in the Big Brush Creek

and Cottonwood Wash sub-watersheds. The surrounding 5th and 6th order HUCs and the main tributary to the reservoir, Big Brush Creek, are shown on Figure 2.

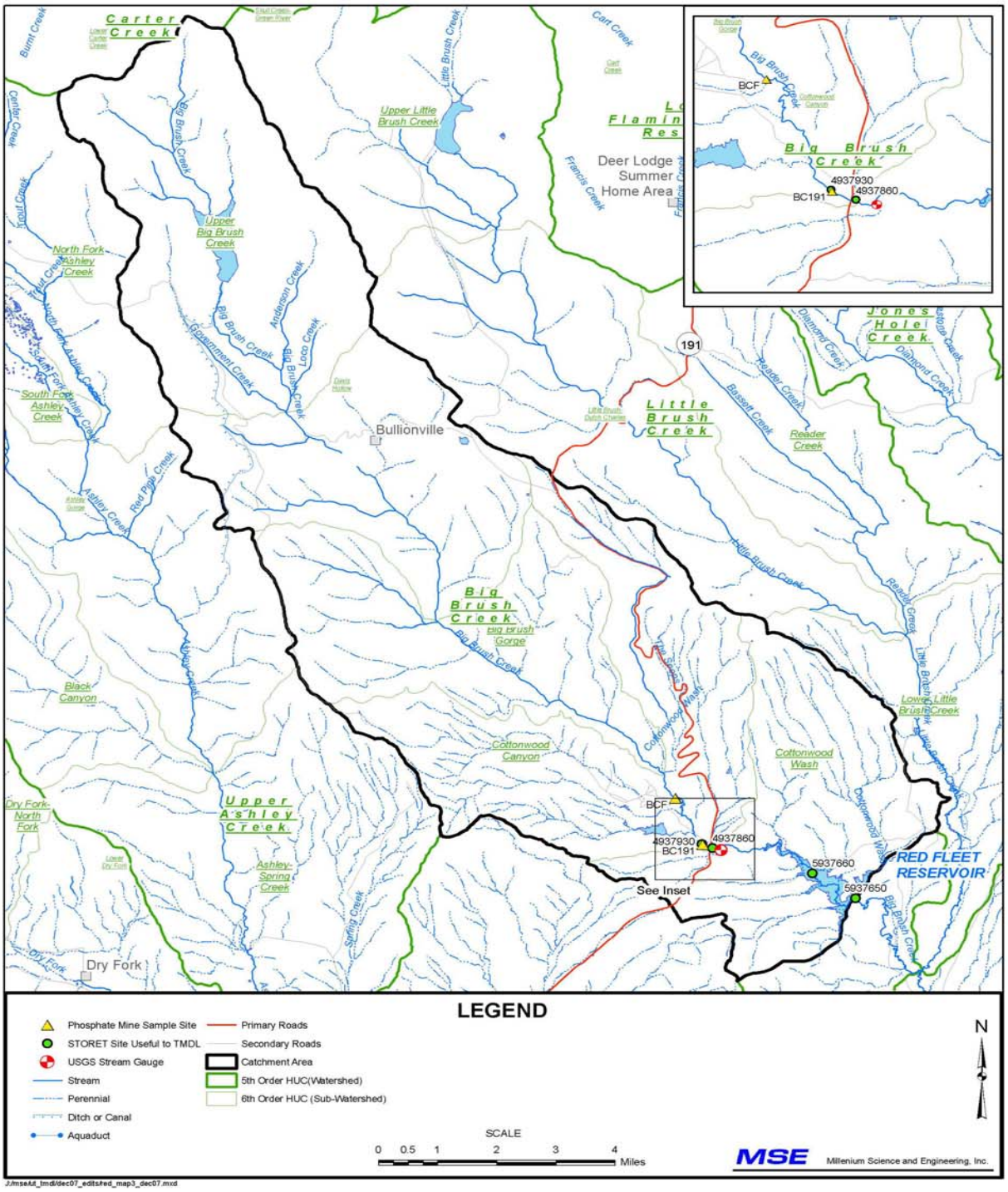

Figure 2. Watersheds

3.2.3.1 Water Quality Monitoring Data

UDWQ collects data from four STORET Stations for screening the water quality of Red Fleet Reservoir. These stations and the year that data was first collected for that location are listed below. Water Quality data collection is ongoing for all of these sites.

STORET	Type	Description	Year First Sampled
4937860	River/Stream	Big Brush Creek at U44 Crossing	1996
4937930	River/Stream	Big Brush Creek above Phosphate Plant	2003
5937650	Lake	Red Fleet Reservoir Above Dam 01	1997
5937660	Lake	Red Fleet Reservoir Midlake 002	1997

For reservoir sampling, UDWQ collects depth profile data using a data sonde that records temperature, pH, specific conductivity, and dissolved oxygen at approximately 1-meter intervals through the water column. Combined with depth profile sampling, are grab samples collected at the surface, 1 meter above the thermocline, 1 meter below the thermocline, and 1 meter from the bottom of the reservoir. Secchi disk depth data are also collected. Water quality samples collected include total nutrients (total and dissolved phosphorus, nitrogen as nitrate + nitrite, nitrogen as ammonia), basic chemistry, turbidity, and chlorophyll. In evaluating the water quality of Red Fleet Reservoir, phosphorus is a parameter of primary interest, as it may be related to low dissolved oxygen, which is a recognized impairment to the designated beneficial use (cold water fishery) of the reservoir (see Section 3.2.4.5).

3.2.3.2 Limnological Assessment

The water quality of Red Fleet Reservoir is very good. It is considered to be moderately hard with a hardness concentration value of approximately 128 mg/L calcium carbonate ($CaCO_3$). Although there are no overall water column concentrations that exceed State water quality standards, there are reported violations of parameters near the bottom of the lake. These parameters include phosphorus, dissolved oxygen and temperature. Although the average water column concentration of total phosphorus has never exceeded the State pollution indicator criteria of 25 ug/L, on occasion values have been reported in excess at various depths in the water column. There are no indications that nutrient concentrations are a problem in the reservoir. Dissolved oxygen deficiencies occur later in the year after the reservoir has stratified. It is not uncommon to have an oxygen limited condition in the bottom 7 meters of the water column. On occasion dissolved oxygen depletions have been more extensive but not as a regular occurrence. Late in the summer it is common for the temperature in the epilimnion to exceed the criteria for a cold-water fishery. The increase in water temperatures near the surface and the decrease in dissolved oxygen in the lower

depths of the reservoir can lead to a situation where coldwater fish are squeezed into a region in the middle of the reservoir. This area may become reduced enough to impact the current fishery present in the reservoir. Current data suggest that the reservoir is currently a nitrogen limited system. Trophic State Index (TSI) values indicate the reservoir is borderline oligotrophic-mesotrophic in a state of low productivity. The reservoir does stratify, and as the season progresses the stratification becomes stronger and more pronounced. The phytoplankton community is dominated by the presence of desmids and flagellates and some blue-green algae that are capable of fixing nitrogen in a nutrient limited system.

3.2.3.3 Pollution Assessment

There are no point sources of pollution in the watershed. Nonpoint pollution sources include grazing, logging, recreation, and mining. Grazing takes place throughout the watershed, but not in the vicinity of the reservoir. Substantial logging has taken place in this watershed, with large timber sales having occurred in the Oaks Park and East Park areas. Simplot Phosphate is a large phosphate surface mine operating on both sides of Big Brush Creek gorge west of US-191. The mine practices revegetation of disturbed areas and has a large settling pond to remove solids from runoff. The UDWQ regulates Simplot phosphate mine via a groundwater discharge permit (UDWQ Groundwater Discharge Permit No. UGW470001). Sediment from the watershed is another source of nonpoint pollution. Heavy rains can wash substantial amounts of sediment from the watershed into the reservoir.

3.2.3.4 Beneficial Use Classifications for Red Fleet Reservoir

Water quality standards in Utah are established to protect the designated beneficial uses of State waters. Red Fleet Reservoir is classified and protected by the State of Utah for the following beneficial uses (Utah Administrative Code R317-2; Standards of Quality for Waters of the State):

> Class 1C -- Protected for domestic purposes with prior treatment by treatment processes as required by the Utah Division of Drinking Water.
>
> Class 2A -- Protected for frequent primary contact recreation where there is a high likelihood of ingestion of water or a high degree of bodily contact with the water. Examples include, but are not limited to: swimming, rafting, kayaking, diving, and water skiing.
>
> Class 3A -- Protected for cold water species of game fish and other cold water aquatic life, including the necessary aquatic organisms in their food chain.
>
> Class 4 -- Protected for agricultural uses including irrigation of crops and stock watering.

3.2.3.5 Beneficial Use Impairments for Red Fleet Reservoir

Water quality monitoring conducted since year 2000 by UDWQ, shows that Red Fleet Reservoir is not meeting its beneficial use for a coldwater fishery (Class 3A beneficial use), due to exceedances of the cold-water fisheries temperature standard of 20°C and low dissolved oxygen (the reservoir can go anoxic in the hypolimnion over the summer). The cause of low dissolved oxygen was attributed to excess algae growth as a result of phosphorus loading in the 2008 Total Maximum Daily Load (TMDL) Report created for Red Fleet Reservoir. (Utah Division of Water Quality, August 2008).

The Division of Water Quality's current 2012-2014 Draft Integrated Report lists Red Fleet Reservoir as being impaired for water temperature (UDWQ, Utah's 2012-2014 Draft Integrated Report).

Red Fleet Reservoir currently has a fish consumption advisory for mercury (UDWQ, Utah Mercury Fish Advisories). Due to high mercury levels found in Largemouth Bass and Walleye from Red Fleet Reservoir, Utah public health officials recommend that:

- Adults eat no more than six 8-oz servings of these fish per month (nine 8-oz servings per month for small Walleye).
- Pregnant women, nursing mothers, and children younger than 12 should eat no more than one 8-oz serving of Largemouth Bass or Walleye per month.
- Women of child bearing age and children 6-16 years of age should eat no more than two 8-oz servings per month (three 8-oz servings per month for small Walleye).

3.2.4 System Operations

Water for the Jensen Unit is obtained by regulation of flows of Big Brush Creek. The project supply along with direct stream flows presently obtained from Big and Little Brush Creeks is used directly for irrigation and for municipal and industrial use. Project storage is provided in Red Fleet Reservoir on Big Brush Creek northeast of Vernal. The total capacity of Red Fleet Reservoir is 26,000 AF and the active capacity is 22,000 AF.

The natural flows of Big Brush Creek exceed the requirement of the presently irrigated lands during the spring snowmelt, but in most years shortages occur during the last half of the irrigation season. Red Fleet Reservoir stores the winter and spring runoff then releases take place during the summer and early fall. Releases are made under the direction of the State Engineer through the representative River Commissioner. The River Commissioner determines the limitation, amount, and status of all reservoir releases and storage rights.

Flood control regulations for Red Fleet Reservoir have been developed jointly by the US Army Corps of Engineers (CORPS) and Reclamation. In November 1996, the Corps issued the Water Control Manual for Red Fleet Dam and Reservoir. Corps flood control activities at Red Fleet Dam are authorized by Section 7 of the Flood Control Act of 1944. The flood control reservation varies up to a maximum of 18,000 AF, based on the time of year and runoff forecast parameters. When water is stored within the portion of the joint use pool that the Water Control Manual for Red Fleet Dam and Reservoir indicates is required for flood control, releases will be made from the reservoir as rapidly as possible without causing flows in Big Brush Creek below the dam to exceed 200 cfs.
Forecasts of inflow to Red Fleet Reservoir are made by the Colorado Basin River Forecast Center in Salt Lake City. The forecasts are published at the first of each month from January to May, for expected inflow volumes into the reservoir occurring from April through the end of July. The average April through-July inflow volume to Red Fleet Reservoir based on the period 1981-2010 is 21,000 AF. Inflow forecasts are used to determine reservoir operations in accordance with flood control regulations. The optimum operation is to fill the reservoir during the snowmelt runoff season and avoid using the spillway.

Since water year 1983 when Red Fleet Reservoir initially filled, it has filled in 20 different years (63 percent fill rate). However, the reservoir last filled in water year 2011, and since that time has steadily declined due to drought conditions and reached a historical low elevation of 5553.5 feet (24 percent full) on August 22, 2014. As the reservoir is operated to avoid using the spillway, historical spills have been minimal, typically nothing more than lapping over the crest. Historical reservoir elevations are shown in the Figure 3.

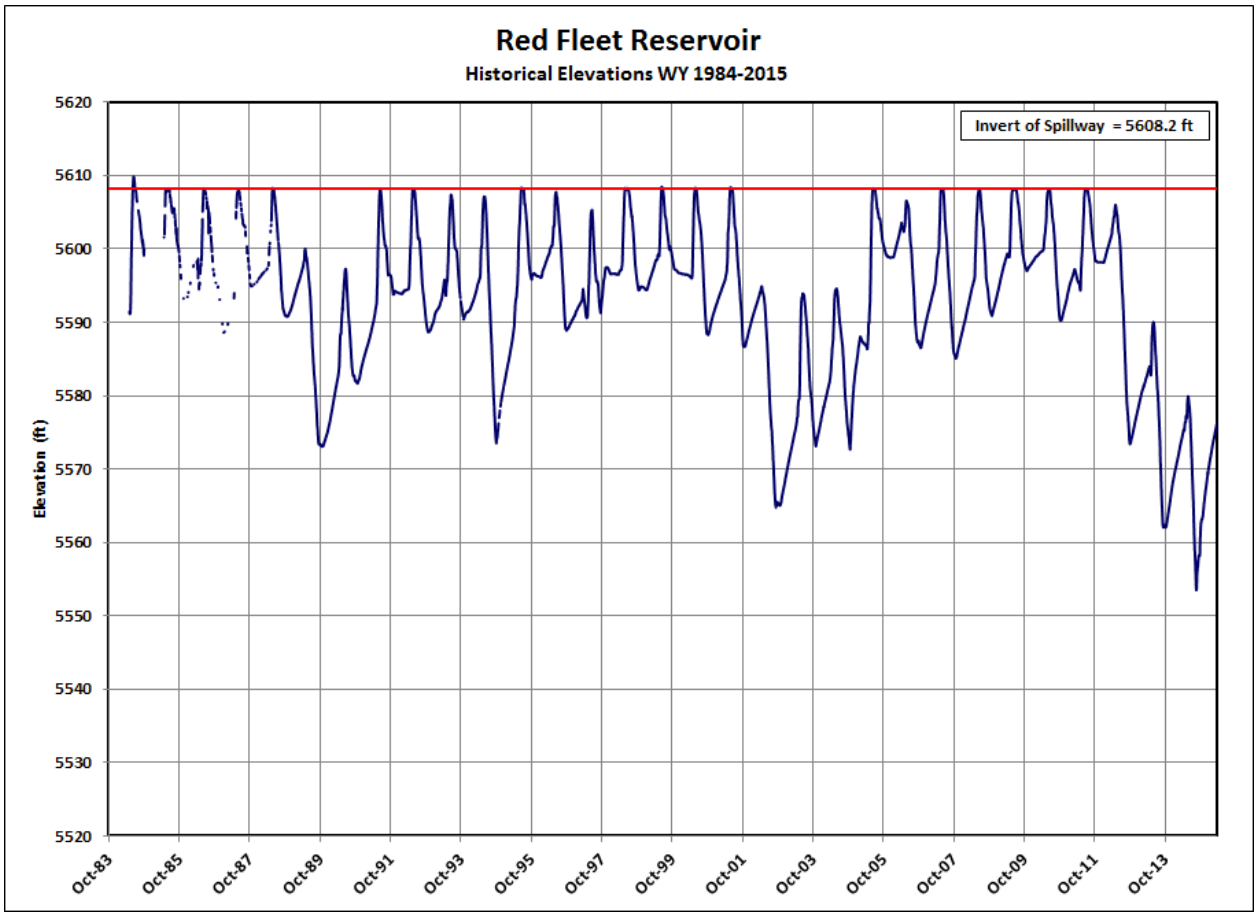

Figure 3. Red Fleet Reservoir Historic Elevations

3.2.5 Public Safety, Access, and Transportation

Red Fleet Dam is constructed on Big Brush Creek about 3.5 miles downstream from its crossing under US-191, and about 10 miles northeast of Vernal, Utah. Red Fleet Reservoir lies within the boundaries of Red Fleet State Park. To the west of the State Park, US-191 is just outside the state park and runs north and south through this area (Figure 1). On the northern side of the state park, County Road 1205, commonly known as Donkey Flat Road, exits US-191 traveling northeast. The road turns easterly and serpentines around the northern boundary of the state park to its eastern border. County Road 1320 turns off Donkey Flat Road and travels southwesterly into the state park, traverses the crest of the dam embankment, and terminates at the toe area of the dam near the dam outlet works and water pumping plant. Other dirt roads, some of which exit US-191, provide access to other public recreational sites located on the southern and northern portion of the reservoir. Recreation facilities at Red Fleet Reservoir are administered by the State Park. Recreation facilities consist of camping, hunting, fishing, boating, and water sports. There were 52,227 recreation use visits spent in the reservoir area during 1996.

3.2.6 Visual Resources

Red Fleet Reservoir is located 10 miles northeast of Vernal, Utah, along US-191. It is approximately 520 surface acres and is located at an elevation on of 5,600 feet. It sits in a rugged red rock setting, with sandstone cliffs and the Uinta Mountains as a backdrop. Red Fleet is known for the petroglyphs that adorn the surrounding area and for dinosaur trackways in the sandstone. The landscape is dominated by juniper, sagebrush, native grasses, and cactus.

3.2.7 Socioeconomics

Visitation days at Red Fleet State Park from 2010 to 2014 have averaged 992.6 for October and 330.2 for November*. As visitation day records do not separate anglers from boaters, campers, wildlife observers, etc. it is not possible from this data to determine exactly how many individuals came to Red Fleet State Park primarily for angling. A recent survey conducted by the Utah Division of Wildlife Resources in February and March 2014 showed that fishing for Walleye in the reservoir was a primary target of at least one-third of the 272 anglers who answered questions regarding which fish species they "target most often when fishing at Red Fleet Reservoir." The UDWR's Red Fleet Reservoir Creel Census conducted between April 2011 and March 2012 estimates that during this time period, approximately 17, 369 fish were caught in Red Fleet. Of all of the fish caught at Red Fleet Reservoir, approximately 62 percent were trout, 7 percent were bass, 4 percent were Bluegill, and less than 1 percent was Walleye. This seems to indicate that even though few Walleye are removed from Red Fleet annually, there are anglers who still make the attempt.
*(http://stateparks.utah.gov/resources/about/park-visitation-data)

3.2.8 Wetlands and Vegetation

Within the proposed treatment area there are established wetland, riparian, and upland communities. Emergent marsh wetlands are found in bays of the reservoir where washes and riparian communities funnel toward the lake. These emergent marsh wetlands occur below the full pool elevation of the reservoir and are therefore periodically inundated. Dominant vegetation within these wetland communities is herbaceous and adapted to frequent or continual inundation. Species commonly found within emergent marsh wetlands include bulrush (*Schoenoplectus* spp.), cattail (*Typha* spp.), rush (*Juncus* spp.), pondweed (*Potamogeton* spp.), smartweed (*Polygonum* spp.), and canary grass (*Phalaris* spp.).

Native and invasive riparian vegetative communities are found along the Brush Creek inflow to the reservoir, Brush Creek outflow below the dam, and natural drainage areas around the reservoir. Wetland vegetation is also found within these areas. Native species commonly found within riparian communities include redosier dogwood (*Cornus sericea*), chokecherry (*Prunus virginiana*), skunkbush sumac (*Rhus trilobata*), willow (*Salix* spp.), silver buffaloberry (*Shepherdia argentea*), snowberry (*Symphoricarpos* spp.), and river hawthorn (*Crataegus rivularis*). Invasive riparian species within the reservoir area include Russian olive (*Elaeagnus angustifolia*) and saltcedar (*Tamarix* spp.).

The reservoir is surrounded by upland vegetation communities. Common species found within these upland communities include pinyon pine (*Pinus edulis*), Utah juniper (*Juniperus osteosperma*), black sagebrush (*Artemisia nova*), Wyoming big sagebrush (*Artemisia tridentata* spp. *wyomingensis*), yellow rabbitbrush (*Chrysothamnus viscidiflorus*), and blackbrush (*Coleogyne ramosissima*).

3.2.9 Fish and Wildlife Resources

3.2.9.1 Fish

Red Fleet Reservoir is considered an oligotrophic-mesotrophic reservoir and has low turbidity (UDWQ 2011a). This means that the reservoir has a low nutrient content for supporting aquatic organisms. The water body also experiences thermal and chemical stratification in the summer months, with the top-most layer becoming too warm to support coldwater fish species. The deepest water layer experiences nutrient loading (sink), but nutrient levels nearer the surface do not appear to exceed state pollution thresholds (UDWQ 2008).

The shoreline habitat of Red Fleet Reservoir has intermixed vegetated and non-vegetated slopes, in addition to a few areas that have been stabilized with riprap (e.g., the dam). The majority of the topography is steep sloping shorelines and cliffs. Much of the habitat in the form of fish cover is represented by boulders or large cobble submerged along the shoreline. Inundated and emergent vegetation is present in the shallow coves and inflow areas. The largest area of submerged vegetation occurs in the northern end of the lake at the Big Brush Creek inflow. Shallow, marsh-like habitat is also present at the mouth of Cottonwood Wash east of the dam.

Red Fleet Reservoir is managed primarily as a put-and-take fishery for Rainbow Trout, although there are Brown Trout present that have entered the reservoir via Big Brush Creek. Due to illegal stockings of black bass (*Micropterus spp.*) and sunfish (*Lepomis spp.*), Red Fleet Reservoir is managed as a two-story fishery, with both coldwater and warmwater fishes (Johnson and Crosby 1992). The illegal stocking of Walleye in 2002 (T. Hedrick 2011, pers. comm.) has become problematic in managing for the Rainbow Trout fishery due to increased predation (Boren 2012).

Fish assemblages for Red Fleet Reservoir have varied historically but currently support eight species of fish. Cold water fish species in the reservoir include Rainbow Trout and Brown Trout. Warm water species include Largemouth Bass, Smallmouth Bass, Green Sunfish, Bluegill, and Walleye have inhabited Red Fleet Reservoir by way of introduction. Red Fleet Reservoir also harbors a population of Flannelmouth Sucker (*Catostomus latipinnis*) that was thought to have been trapped in the reservoir from Big Brush Creek during dam construction.

In Big Brush Creek, approximately 4 to 5 miles below the dam, sampling by the UDWR demonstrated the presence of mottled sculpin (*Cottus bairdii*) and

Mountain Sucker (*Catostomus platyrhynchus*). These fish are likely present in Big Brush Creek up to the dam.

3.2.9.2 Birds

Red Fleet Reservoir receives a substantial amount of bird use during all seasons of the year because of the presence of a complex of open water and upland habitats. This complex provides waterfowl, grebes, and other waterbirds with resources they require, including food items (e.g., fish, macroinvertebrates, and some emergent vegetation) and habitat to loaf and rest. However, protective cover, nest material, and secluded nesting areas are rather limited in the project area. Such resources are directly associated with riparian-wetland vegetation types that are larger than 1 acre in size, and therefore are in short supply in the project area. The quality of the habitat for waterfowl and other waterbirds is influenced by the high degree of disturbance resulting from recreational use and fluctuating water levels.

Water birds potentially found in the project area include common loon (*Gavia immer*), piedbilled grebe (*Podilymbus podiceps*), eared grebe (*Podiceps caspicus*), western grebe (*Aechmophorus occidentalis*), Clark's grebe (*Aechmophorus clarkii*), American white pelican (*Pelecanus erythrorhynchos*), double-crested cormorant (*Phalacrocorax auritus*), great blue heron (*Ardea herodias*), Canada goose (*Branta canadensis*), gadwall (*Anas strepera*), American wigeon (*Anas americana*), mallard (*Anas platyrhynchos*), northern pintail (*Anas acuta*), cinnamon teal (*Anas cyanoptera*), green-winged teal (*Anas carolinensis*), redhead (*Aythya americana*), ring-necked duck (*Aythya collaris*), lesser scaup (*Aythya affinis*), northern shoveler (*Spatula clypeata*), common merganser (*Mergus merganser*), ruddy duck (*Oxyura jamaicensis*), American coot (*Fulica americana*), killdeer (*Charadrius vociferous*), spotted sandpiper (*Actitis macularius*), greater yellowlegs (*Tringa melanoleuca*), willet (*Tringa semipalmata*), Franklin's gull (*Larus pipixcan*), ring-billed gull (*Larus delawarensis*), California gull (*Larus californicus*), and Forster's tern (*Sterna forsteri*). Waterfowl hunting is allowed at Red Fleet according to current UDWR waterfowl hunting guidebook regulations.

Raptors, such as red-tailed hawk (Buteo jamaicensis), osprey (*Pandion haliaetus*), great-horned owls (*Bubo virginianus*), barn owl (*Tyto alba*) and American kestrel (*Falco sparverius*), likely occur throughout the project area, particularly in the cottonwood (*Populus sp.*) around the reservoir edges. Peregrine falcon (*Falco peregrinus*) have nested near the project area (Maxfield 2012). Bald eagle (*Haliaeetus leucocephalus*) commonly winter on the reservoir. Golden eagle (*Aquila chrysaetos*) has been documented nesting along the cliffs on the north end of Red Fleet Reservoir (Maxfield 2012). Both eagle species are given special protection under the Bald and Golden Eagle Protection Act, which prohibits the take of birds, their parts, nests, or eggs without a permit.

Songbirds using habitat in the project area could include yellow-rumped warbler (*Dendroica coronata*), black-capped chickadee (*Poecile atricapillus*), mountain

bluebird (*Sialia currucoides*), white-crowned sparrow (*Zonotrichia leucophrys*), chipping sparrow (*Spizella passerina*), and song sparrow (*Melospiza melodia*).

Other species of birds using the project area include mourning dove (*Zenaida macroura*), northern flicker (*Colaptes auratus*), Steller's jay (*Cyanocitta stelleri*), pinyon jay (*Gymnorhinus cyanocephalus*), western scrub-jay (*Aphelocoma californica*), black-billed magpie (*Pica hudsonia*), common raven (*Corvus corax*), American crow (*Corvus brachyrhynchos*), tree swallow (*Tachycineta bicolor*), violet-green swallow (*Tachycineta thalassina*), northern rough-winged swallow (*Stelgidopteryx serripennis*), cliff swallow (*Hirundo pyrrhonota*), wild turkey (*Meleagris gallopavo*), and common nighthawk (*Chordeiles minor*).

3.2.9.3 Wildlife

The project area provides habitat for a number of mammal species, including big game, small mammals, bats, and others. The pinyon-juniper, sagebrush and grassland habitats around the reservoir serve as both summer and winter habitat for mule deer and winter habitat for elk. Moose (*Alces alces*) may use stream drainages associated with the Red Fleet Reservoir, and predators such as black bear (*Ursus americanus*), mountain lion (*Felis concolor*), and coyote (*Canis latrans*) are also found in the area. They also likely use the reservoir, inlet, and outlets for free water sources. Big game hunting is not allowed within the project area, which may provide important refuge for these species during hunting season.

Other mammals potentially found within the project area include dwarf shrew (*Sorex nanus*), Merriam's shrew (*Sorex merriami*), mountain cottontail (*Sylvilagus nuttalli*), white-tailed jackrabbit (*Lepus townsendii*), beaver (*Castor canadensis*), porcupine (*Erethizon dorsatum*), northern pocket gopher (*Thomomys talpoides*), Ord's kangaroo rat (*Dipodomys ordii*), brush mouse (*Peromyscus boylii*), canyon mouse (*Peromyscus crinitus*), deer mouse (*Peromyscus maniculatus*), pinyon mouse (*Peromyscus truei*), long-tailed vole (*Microtus longicaudus*), muskrat (*Ondatra zibethicus*), cliff chipmunk (*Neotamias dorsalis*), Hopi chipmunk (*Neotamias rufus*), least chipmunk (*Neotamias minimus),* Uinta *chipmunk (Neotamias umbrinus),* yellow-bellied marmot *(Marmota flaviventris*), red fox (*Vulpes vulpes*), ringtail (*Bassariscus astutus*), raccoon (*Procyon lotor*), American mink (*Mustela vison*), badger (*Taxidea taxus*), long-tailed weasel (*Mustela frenata*), and bobcat (*Lynx rufus*). Northern river otter (*Lontra canadensis*) breed at Red Fleet Reservoir and along Big Brush Creek, both above and below the reservoir (Maxfield 2012). A small number of white-tailed prairie dog (*Cynomys leucurus*) can be found in the basin on the southwest side of the reservoir (Maxfield 2012).

The project area also supports a number of bat species, because of the availability of a stable insect prey source associated with the reservoir and the riparian-wetland habitats along Big Brush Creek and the reservoir shoreline. Both spotted bat (*Euderma maculata*) and big free-tailed bat (*Nyctinomops macrotis*) have been detected during acoustic surveys just above the reservoir along Big Brush Creek

(Maxfield 2012). Other potential species include big brown bat (*Eptesicus fuscus*), little brown myotis (*Myotis lucifugus*), and long-eared myotis (*Myotis evotis*).

Suitable habitat for amphibians at Red Fleet is very limited. The relatively degraded riparian wetland habitats are small and disturbed, but it is likely that some species thrive within the project area, particularly those that are tolerant of arid conditions, such as the Great Basin spadefoot (*Spea intermontana*).

3.2.10 Threatened, Endangered, and Sensitive Species

3.2.10.1 Plants

There is a possibility that multiple Threatened (T), Endangered (E), and Sensitive (S) plant species could occur in and around the project area. Potential occurrence of these species is based on the existence of appropriate habitats. Complete surveys of the project and surrounding areas have not been completed, largely due to the fact that the Proposed Action is a rotenone treatment of the water in Red Fleet Reservoir. The following species could potentially be found in Uintah County and the project area. Bedrock Canyon and Tableland vegetation type has the potential to support Graham's columbine (*Aquilegia grahamii* - S), Canyonlands sedge (*Carex curatorum* - S), Flowers' penstemon (*Penstemon flowersii* - S), and alcove death camas (*Zigadenus vaginatus* - S). Pinyon-Juniper Woodland has the potential to support park rockcress (*Arabis vivariensis* - S), Hamilton's milkvetch (*Astragalus hamiltonii* - S*),* Ownbey thistle (*Cirsium ownbeyi* - S), Graham's cryptantha (*Cryptantha grahamii* - S), White River penstemon (*Penstemon scariosus var. albifluvis* - S), Uinta wirelettuce (*Stephanomeria tenuifolia var. uintaensis* - S), and sterile yucca (*Yucca sterilis* - S). Sagebrush shrubland has the potential to support horseshoe milkvetch (*Astragalus equisolensis* - S), Ownbey thistle, Graham's cryptantha, Garrett bladderpod (*Lesquerella garrettii - S*), White River penstemon (*Penstemon scariosus var. albifluvis* - S), and sterile yucca. Mixed Low Sagebrush Shrubland has the potential to support park rockcress, horseshoe milkvetch, Hamilton's milkvetch, Graham's cryptantha, orchard snakeweed (*Gutierrezia pomariensis* - S), Uinta parrya (*Parrya rydbergii* - S), alcove bog-orchid (*Platanthera zothecina* - S), shrubby reed-mustard, Uinta basin hookless cactus, and sterile yucca. Shrub steppe has the potential to support park rockcress, Hamilton's milkvetch, Uinta parrya, Goodrich's penstemon (*Penstemon goodrichii* - S), Graham's penstemon, shrubby reed-mustard, pariette cactus, and Uinta basin hookless cactus. Riparian areas have the potential to support giant helleborine (*Epipactis gigantean* - S), and Ute ladies'-tresses (*Spiranthes diluvialis* - T). Subalpine meadow has the potential to support Garrett bladderpod, and large yellow evening primrose (*Oenothera flava var. acutissima* - S).

Many of the rare plant species have the potential to occur in more than one vegetation community type. The vegetation communities with the highest number of potential rare plant species are Mixed Low Sagebrush Shrubland (10 species), Pinyon-Juniper Woodland (8 species), and Shrub Steppe (8 species).

Conversely, Emergent Marsh, Wash, Invasive Riparian, and the disturbed vegetation communities do not have the potential for rare plant occurrence.

3.2.10.2 Fish and Wildlife

There are a total of seven federally listed fish and wildlife species that could potentially occur in the project area. Three species will not be analyzed because they are not currently found in the area, or the habitat is not present to support the species based on life history requirements: Mexican spotted owl (*Strix occidentalis lucida* – T), yellow-billed cuckoo (*Coccyzus americanus* – T), and Canada lynx (*Lynx canadensis* – T). The remaining four federally listed species and additional sensitive species are delineated in Table 1.

Table 1
Threatened, Endangered, and Sensitive Species Potentially Found in the Project Area

Common name	Scientific Name	Status
	Birds	
American White Pelican	*Pelecanus erythrorhynchos*	Sensitive
Bald Eagle	*Haliaeetus leucocephalus*	Sensitive
Burrowing Owl	*Athene cunicularia*	Sensitive
Ferruginous Hawk	*Buteo regalis*	Sensitive
Greater Sage-Grouse	*Centrocercus urophasianus*	Sensitive
	Mammals	
Big Free-tailed Bat	*Nyctinomops macrotis*	Sensitive
Spotted Bat	*Euderma maculatum*	Sensitive
Townsend's Big-eared Bat	*Corynorhinus townsendii*	Sensitive
White-tailed Prairie Dog	*Cynomys leucurus*	Sensitive
	Fish	
Flannelmouth Sucker	*Catostomus latipinnis*	Sensitive
Bonytail	*Gila elegans*	Endangered - ESA
Colorado Pikeminnow	*Ptychocheilus lucius*	Endangered - ESA
Humpback Chub	*Gila cypha*	Endangered - ESA
Razorback Sucker	*Xyrauchen texanus*	Endangered - ESA

The four endangered Colorado River fish species are not found in Red Fleet Reservoir, or in the downstream 14 miles of Big Brush Creek to the confluence with the Green River. These fish are occasionally observed where the Big Brush Creek meets the Green River. In addition, the only sensitive species found in the inlet and in the reservoir is the Flannelmouth Sucker. It is likely that these

suckers were impounded in the reservoir, but due to the fact that there are multiple age classes and a few fish that have been aged were less than the age of the dam, spawning is occurring in Big Brush Creek. Preliminary information from the UDWR suggests that spawning habitat occurs near the inlet of the reservoir with Big Brush Creek. The rest of the sensitive species in Table 1 may use the reservoir, inlet, or outlet for a free water source, but they are not found at the reservoir consistently throughout the day or the calendar year.

3.3 Environmental Effects of Alternatives

3.3.1 Recreation

3.3.1.1 No Action Alternative

There would be no changes to recreation at Red Fleet Reservoir and results in no impacts on visual resources within the Study Area.

3.3.1.2 Proposed Action

Under the Proposed Action Alternative, there would be some impacts to recreation. The impacts to recreation would be mostly to those who come to the reservoir for fishing post treatment. While the fishing is expected to recover in less than two years back to a similar state, the fishing will be slower during that time period due to stocking of smaller prey fish, though prey fish will be stocked at the maximum possible numbers. Since fish will be restocked immediately following the treatment, fishermen will have the opportunity to catch fish, but at a slower rate. The slower rate should be limited to approximately one or two years, depending on species success.

Another impact to the park will be the potential of having to close the park for safety purposes. To avoid the potential of the public getting into the reservoir while the treatment is taking place, the park may have to be closed during the treatment and detoxification period. This timeframe is potentially up to three weeks. This will have a minor impact to the park visitation. Visitation numbers to the park during the month of October is approximately 924 visitors with an average annual visitation number of 32,546.

Another possible impact to the park will be the dead fish that will be visible to the park visitors. When the treatment is done approximately one third of the population of deceased fish are anticipated to float to the surface while the remaining two thirds will either sink to the bottom or remain suspended in the water column for a short time. The fish that rise to the surface could provide a negative visitor experience because of the decaying fish smell and the sight of dead fish. To help reduce the impact to the visitor's, large groups of fish that are found floating should be sunk to the bottom, or removed from the water body.

3.3.2 Water Resources

3.3.2.1 No Action Alternative

The No Action Alternative would have no effect on water resources.

3.3.2.2 Proposed Action

The Proposed Action would have no effect on water resources. Current management and dam operations would continue, and water resources would not change.

3.3.3 Water Quality

3.3.3.1 No Action Alternative

The No Action Alternative would not change the water quality of the reservoir. Current management and dam operations would continue, and water quality impacts would not change.

3.3.3.2 Proposed Action – Direct and Indirect Effects

There would be short-term direct effects to water quality as a result of the chemical treatment with rotenone. The primary direct effect is caused by the toxicity of rotenone to aquatic organisms. Rotenone naturally detoxifies in flowing waters relatively rapidly (often within 24 hours) due to dilution and increased rates of hydrolysis and photolysis (Finlayson et. al 2000). In standing water, toxic effects may occur for up to 4 to 5 weeks with colder water temperatures (Bradbury 1986).

One of the primary indirect water quality concerns related to rotenone treatments is the impact to benthic macroinvertebrate communities. Rotenone was historically used as an insecticide, therefore it has a dramatic short-term impact on aquatic macroinvertebrates. The primary concern arises from the population and taxonomic diversity level.

Unfortunately, although many rotenone treatments have been monitored, little is known about the true effects of rotenone treatments on macroinvertebrate communities (Vinson et al. 2010). It is believed that rotenone impacts macroinvertebrates similarly to other natural disturbances such as floods, or drought. Although the mechanisms may be different, all of these events cause catastrophic drift and/or very high mortality for a majority of benthic taxa. For example, when a flood occurs, the catastrophic drift appears to be caused by the initiation of the bedload transport (Gibbins et al., 2007). High proportions of drifting 4-2 macroinvertebrates are dead during these events (Dinger and Marks 2007; Gibbins et al. 2007). Numbers of aquatic invertebrates important to the aquatic ecosystem are locally suppressed for variable periods of time after disturbance. Refuge from disturbance, such as areas upstream, offstream habitats (Hynes 1972) and the hyporheic zone (Marmonier et al. 1997) provide a source for recolonization.

UDWR expects a similar benthic macroinvertebrate response with the implementation of a rotenone treatment, with some exceptions. Unlike floods, which directly impact almost all benthic taxa, Mangum and Madrigal (1999) reported rotenone resistance in 9-33 percent of the taxa that occurred in the Strawberry River.

A large body of literature exists regarding the recovery of aquatic macroinvertebrate populations after a rotenone treatment (see Vinson et al. 2010). Most of the studies have been short term and likely have not been intensive enough to adequately answer the long-term questions (Vinson et al. 2010). In general, abundance of macroinvertebrates returns to pretreatment densities within a few months to a year. However, recovery times of taxa richness or diversity appear to be much slower. The longest-term monitoring studies reviewed by Vinson et al. (2010), ranged from 2 to 5 years. Most of the invertebrate species would repopulate the treated area within one or two years (California Department of Fish and Game 1994). In the Strawberry River drainage, where the target concentration of rotenone (3 ppm) was greater than that planned for the project area, and where an attempt was made to treat all water in the drainage, 22 to 53 percent of the taxa recovered after one year, but 7 to 14 percent of the taxa were still missing after 5 years. (Mangum and Madrigal 1999). Whelan (2002) monitored the effects of the 1995 and 1996 rotenone treatments on Manning Creek, Utah. The Manning Creek treatment had lower target concentrations of rotenone and lower application times than the Strawberry treatment studied by Mangum and Madrigal (1999).

Whelan (2002) indicated that leaving fishless stream reaches untreated and using the minimum rotenone concentration and treatment time necessary to achieve the objectives of trout removal, were reasonably effective mitigation measures to speed aquatic macroinvertebrate recovery, when compared to the Strawberry treatment. The majority of taxa recovered and were found in the post-treatment samples. Many taxa were only found posttreatment and a few taxa were missing post-treatment. The Whelan study provides an example of the shortcomings of most macroinvertebrate monitoring studies. Vinson et al. (2010) provide the results of a long-term (10-year) macroinvertebrate dataset collected at monthly intervals in the Logan River. They found that, on average, 27.5 genera were found per sample. However, the genera accumulation curve indicates that over 80 different genera have been found over the study period, and new genera are still being found.

Engstrom-Heg et al. (1978) conducted a laboratory study of the rotenone tolerance of aquatic macroinvertebrates. They felt that a treatment of less than 10 ppm-hours would generally result in only mild and temporary reduction of the aquatic macroinvertebrate community. This is a somewhat lower treatment level than the Manning Creek treatment was, but is within the general application rate and time of rotenone treatments conducted in recent years in southern Utah since the Manning Creek treatment. During collections of aquatic macroinvertebrate samples from Pine Creek in southern Utah, only 5 days following a rotenone

treatment at this lowest application level many live aquatic macroinvertebrates were found.

Recent literature suggests that acute (as opposed to chronic) exposure to rotenone is not harmful to mammals, including humans, at the concentrations used to control fish (see elsewhere in this document for a fuller discussion of rotenone toxicity). It has been estimated that a 132-lb person would have to consume over 60,000 liters of treated water at one sitting to receive a lethal dose (Sousa et al. 1987). Using a safety factor of 1,000X and the most conservative safe intake level, a person could still drink 14 liters of treated water per day. Extensive testing has not shown rotenone to be carcinogenic (Bradbury 1986). Even though rotenone in the concentrations used for fish control has not been linked to acute toxicity to humans, as a matter of policy, the EPA does not set tolerances for pesticides in potable water. The State of California (California Department Of Fish And Game 1994) and the National Academy of Science (1983), have computed "safe" levels of rotenone in drinking water that are roughly equivalent to the detection level of rotenone in water (0.005 ppm pure rotenone).

The mobility of rotenone in soil is low. In fact, the leaching distance of rotenone is only 2 cm in most types of soils. This is because rotenone is strongly bound to organic matter, making it unlikely that it would enter groundwater. At the same time, rotenone breaks down rapidly into temporary residues that would not persist as pollutants of groundwater (Turner et al. 2007)). Ultimately, rotenone breaks down into carbon dioxide and water.

A secondary indirect effect of the treatment would be a temporary increase in the nutrient input to the water as a result of decomposition of fish that are killed. This effect would occur for a period of approximately two weeks while decomposition occurred. However, natural mortality has always occurred and the increase attributable to rotenone treatments would be negligible with respect to the ecosystem. Some of the nutrients would likely be rapidly assimilated by rebounding aquatic macroinvertebrate populations.

The UDWR does not believe that changes in water quality during the project would impair other uses. Rotenone would not affect plants, and treated water would still be of suitable quality for use by deer/elk and livestock, and other mammals and birds (Turner et al. 2007).

Potassium permanganate would degrade to nontoxic, common compounds or elements shortly after application at the concentrations used. The neutralization is not immediate in space, but requires a short mixing zone where the $KMnO_4$ is in contact with and oxidizes the rotenone. Downstream of this mixing zone, both fish and aquatic macroinvertebrates would not be affected.

Drinking water supplies would not be affected by the use of $KMnO_4$ because it rapidly breaks down into potassium, manganese, and water. Because $KMnO_4$ is commonly used to treat drinking water at levels comparable to those used to

neutralize rotenone, there would be no effect to drinking water supplies (Holdaway 2010).

3.3.4 System Operations

3.3.4.1 No Action Alternative

The No Action Alternative would have no effect on system operations.

3.3.4.2 Proposed Action

The Proposed Action would have no effect on system operations.

3.3.5 Public Safety, Access, and Transportation

3.3.5.1 No Action Alternative

The No Action Alternative would have no impact on public safety, access, and transportation.

3.3.5.2 Proposed Action

The Division will serve as or designate a project Safety Office, typically a staff member from the Law Enforcement section, to monitor all actions associated with the project, and take corrective action to remedy unsafe activities. All personnel involved with the project have received, or will have received safety training prior to the treatment day. Training will cover safe application and transportation of rotenone and potassium permanganate, including potential hazards of the project. Personnel applying chemicals will have obtained their pesticide applicator license from the Utah Department of Agriculture. All personnel will have reviewed the safety precautions for each product level before the application and all project participants will be involved in identifying other hazards and actions that may jeopardize safety during the project.

Each applicator will receive two personal eye wash bottles for immediate response to eye contact with a chemical. Water, including additional eye wash stations, showers, and drinking water will be available at the base camp at the main boat ramp. Anyone experiencing chemical exposure will be asked to perform immediate triage on the water, but then return to the boat ramp for further treatment as quickly as possible.

Applicators dispensing powdered rotenone from boats will be given tyvek suits, nitrile gloves, and “Breathe Easy” respirators. Additional batteries will be available for the Breathe Easy respirators due to the anticipated length of the treatment. Liquid applicators, the detox station, and anyone dispensing chemical in preparation for the treatment will be required to wear long sleeves, half-mask respirators with vapor cartridges, eye protection, and nitrile gloves.

3.3.5.2.1 Site Security

According to AFS Standard Operating Procedures (Finlayson et al. 2010), UDWR will place signs around the reservoir denoting that the reservoir is closed due to the use of rotenone. Signs will include closure period dates, formulation used,

and purpose of the treatment. The Safety Officer any State Parks personnel present will be in charge of discussing the treatment with any members of the public arriving onsite during the treatment.

3.3.5.2.2 Fish Disposal After Treatment

Dead fish will be sampled for length and weight post-treatment. Fish sampled will either be sunk in the lake or removed and disposed of properly.

3.3.5.2.3 Spill Contingency

All mixing operations will be conducted within boats at the reservoir or within a cattle trough near the water's edge. If a spill occurs, the first priority will be to contain the spilled material. Shovels will be used for immediate containment or to channelize the spilled material (liquid) into a containment area. The following actions will be taken as necessary to contain a spill on the ground:

1. Stopping the spillage at its source;
2. Diking in pools as appropriate;
3. Using materials such as clay or soil to absorb standing rotenone by pump or sponge and deposition into target area;
4. Neutralizing the spill site with $KMnO_4$ and suitable disposal of neutralized material.

The Safety Officer will be responsible for immediately reporting ground spills of liquid rotenone over 20 gallons and $KMnO_4$ to the following entities:

1. Vernal Office Division Regional Supervisor
2. Uintah County Sheriff's Office

3.3.6 Visual Resources

3.3.6.1 No Action Alternative

There would be no changes in visual resources at Red Fleet Reservoir and State Park, therefore a no effect determination was made.

3.3.6.2 Proposed Action

There would be no changes in visual resources at Red Fleet Reservoir and State Park, therefore a no effect determination was made.

3.3.7 Socioeconomics

3.3.7.1 No Action Alternative

Under a No Action Alternative, there would be no changes to irrigation or municipal and industrial water deliveries, and anglers would continue to visit Red Fleet Reservoir in the same manner as they have for many years. There would be no change in the socioeconomic status in the area.

3.3.7.2 Proposed Action

The Proposed Action will not affect irrigation deliveries, or the delivery of water for M&I purposes in the Uintah Water Conservancy District's service area. However, impacts to local recreation related to fishing have the potential to be significant. Visitation days at Red Fleet State Park from 2010 to 2014 have averaged 992.6 for October and 330.2 for November. As visitation day records do not separate anglers from boaters, campers, wildlife observers, etc. it is not possible from this data to determine exactly how many individuals came to Red Fleet State Park primarily for angling. A recent survey conducted by the Utah Division of Wildlife Resources in February and March 2014 showed that fishing for Walleye in the reservoir was a primary target of at least one-third of the 272 anglers who answered questions regarding which fish species they "target most often when fishing at Red Fleet Reservoir." The UDWR's Red Fleet Reservoir Creel Census conducted between April 2011 and March 2012 estimates that during this time period, approximately 17, 369 fish were caught in Red Fleet. Of all of the fish caught at Red Fleet Reservoir, approximately 62 percent were trout, 7 percent were bass, 4 percent were Bluegill, and less than 1 percent were Walleye. This seems to indicate that even though few Walleye are removed from Red Fleet annually, there are anglers who still make the attempt.

With sufficient notice being given of the Proposed Action, many anglers have the option to bump up their recreating dates and fish Red Fleet in September and the first part of October, or visit neighboring Steinaker Reservoir (9 miles) which also holds trout, Bluegill and Largemouth Bass or Flaming Gorge Reservoir (30 miles) which is a very popular fishery for both trout and Smallmouth Bass. No jobs would be created or eliminated due to this action.

3.3.8 Wetlands and Vegetation

3.3.8.1 No Action Alternative

The No Action Alternative would have no effect on wetlands and vegetative communities within the proposed treatment area.

3.3.8.2 Proposed Action

The Proposed Action Alternative would have no effect on wetlands and vegetative communities within the proposed treatment area. Rotenone is a naturally occurring chemical obtained from the roots of several tropical and subtropical plant species. Rotenone is a selective, non-specific, organic insecticide that is used in home gardens to control chewing insects, on pets and livestock for external parasite control, and for fish eradications as part of fisheries management. Rotenone works by inhibiting the transfer of oxygen from the gills to the rest of the body. This makes rotenone extremely effective on organisms that breathe through gills. Rotenone is not readily absorbed by mammals or vegetation (American Fisheries Society).

3.3.9 Fish and Wildlife Resources

3.3.9.1 No Action Alternative

Under the No Action Alternative, the rotenone treatment would not be completed and the current conditions would remain the same. More specifically the fishery, comprised mainly of illegal introductions, would remain unchanged. In addition, the threat of non-native Walleye, entering Big Brush Creek and eventually the Green River, due to a spill event would continue. As for birds and other wildlife, under the No Action Alternative, conditions would also remain the same.

3.3.9.2 Proposed Action

3.3.9.2.1 Fish

As a result of implementation of the Proposed Action, the fish in Red Fleet would die, meeting the intent of the treatment. Some would float to the top (approx. 30 percent) but the majority would sink to the bottom. As the treatment is non-discriminatory, all fish, warm or cold water species, native or non-native, including some aquatic invertebrates, would likely be killed. This would remove the threat of Walleye and any other non-native predatory fish species (of sensitive or threatened and endangered fish species) from escaping the reservoir due to a spill event or through the outlet works. There would not be any long-term effects of the treatment on future fish planted in the reservoir. After a few days the rotenone loses its effectiveness and new fish species can be safely reintroduced. After the completion of the treatment, the detoxification of releases, and the documentation of a fall zooplankton bloom, Red Fleet Reservoir will be immediately restocked with 520 6 to 8 inch long sterile Walleye and 10,000 ten inch long Rainbow Trout. UDWR will also pursue transferring a number of forage species including Black Crappie, Yellow Perch, and Mountain Whitefish. These fish will be transferred to Red Fleet from other waters around the state pending Aquatic Invasive Species (AIS) and disease certification results of the transferring water. Transfers may occur as early as winter 2015-2016, or as late as summer 2016. Restocking of additional predator species including Wipers and Tiger Trout will occur in limited numbers beginning summer 2016.

Annual monitoring for zooplankton and fish species will occur for three years to document re-establishment, reproduction and persistence of desired species. The stocking request will be reviewed after three years to determine whether any species have been unsuccessful and should no longer be stocked into the reservoir. Sampling after that will likely continue to be done annually, just not as intensively once UDWR have information on the success of the species stocked.

3.3.9.2.2 Birds

Negative effects to birds during the treatment would be minimal. There would likely be direct effects of temporary displacement of birds from the area due to the number of boats and personnel out on the water. Due to the proposed timing of the treatment in the fall, most migratory birds would have already left the area. There may be a greater probability of displacing ducks and water-dependent bird

species, than upland and passerine species. Regardless, displacing birds makes them more susceptible to predation and could cause them to select less suitable or marginal habitat. In addition, some raptor or scavenging bird species could consume dead or dying fish, amphibians, or aquatic insects. The probability or threat of these indirect effects are minimal and would be short in duration. As evidenced by other rotenone treatments, recovery of the system is relatively quick and effects to bird species would likely be negligible.

3.3.9.2.3 Wildlife

3.3.10 Threatened, Endangered, Candidate, Proposed, and Sensitive Species

3.3.10.1 No Action Alternative

Under the No Action Alternative, the rotenone treatment would not be completed and the current conditions would remain the same. There would be a continued threat of non-native predatory fish escaping Red Fleet reservoir and potentially entering the Green River where the four Colorado River endangered fish reside.

3.3.10.2 Proposed Action

3.3.10.2.1 Plants

Under the Proposed Action, there would be no effect to Ute ladies'-tresses (T), if present near or around the reservoir. Uptake of the chemicals would not kill the plant or render them incapable of reproduction. The treatment is designed to kill gill-breathing animals (mainly fish) in the reservoir and would not affect plant species near or around the reservoir.

3.3.10.2.2 Fish and Wildlife

Under the Proposed Action, a chemical will be used below the dam in Big Brush Creek to neutralize any rotenone leaving the reservoir. This would minimize effects to extant fish, including any sensitive species downstream. It is estimated that the neutralized section, and therefore any minimal adverse effects to fish species, would occur 1 mile downstream of the dam. There would be no effect to any aquatic species beyond that neutralization zone. If any of the four endangered Colorado River fish species were within the first mile of Big Brush Creek near the confluence with the Green River, there would be a 14 mile buffer between them and the treatment. Due to this rationale there would be no effect to the four Colorado River endangered fish species. In addition, as there is no critical habitat in area, there will be no adverse effect to critical habitat.

The only sensitive species found in the inlet and in the reservoir is the Flannelmouth Sucker. It appears that spawning is occurring in habitat near the inlet of the reservoir with Big Brush Creek. Any fish in the reservoir during the treatment time will die as a result of the treatment. However, naturally occurring suckers in Big Brush Creek would likely replace those killed in the treatment over a few years' time. Though this will negatively affect Flannelmouth Suckers in the short term, it will not contribute toward a trend of listing the species. All agencies

involved including the UDWR and USFWS believe the overall positive cumulative effect far outweighs the short term negative effect of losing the sucker in the reservoir for a short period of time.

3.4 Summary of Environmental Effects

Table 2 below describes environmental effects under the No Action Alternative and the Proposed Action Alternative.

Table 2
Summary of "Environmental Effects of the Red Fleet Reservoir Rotenone Treatment Project

Resource Issue	No Action Alternative	Proposed Action
Recreation	No effect	Minimal and temporary effects during treatment
Water Resources	No effect	No effect
Water Quality	No effect	Minimal impacts
System Operations	No effect	No effect
Public Safety, Access, and Transportation	No effect	Minimal short term impacts during treatment
Visual Resources	No effect	No effect
Socioeconomics	No effect	Minimal impacts
Cultural Resources	No effect	No effect
Paleontological Resources	No effect	No effect
Wetlands and Vegetation	No effect	No effect
Wildlife Resources	No effect	Minimal and temporary effects during treatment
Threatened, Endangered, Candidate, and State Sensitive Species	No effect	No effect to Threatened and Endangered Species and minimal impacts to State Sensitive Species during treatment

3.5 Indian Trust Assets

Indian Trust Assets are legal interests in property held in trust by the United States for Federally recognized Indian Tribes or Indian individuals. Assets can be real property, physical assets, or intangible property rights, such as lands, minerals, hunting and fishing rights, and water rights. The United States has an Indian trust responsibility to protect and maintain rights reserved by or granted to such tribes or individuals by treaties, statutes, and executive orders. These rights are sometimes further interpreted through court decisions and regulations. This trust responsibility requires that all Federal agencies take all actions reasonably

necessary to protect trust assets. Reclamation carries out its activities in a manner which protects these assets and avoids adverse impacts when possible. When impacts cannot be avoided, Reclamation would provide appropriate mitigation or compensation. Implementation of the Proposed Action Alternative would have no foreseeable negative impacts on Indian Trust Assets.

3.6 Environmental Justice

Executive Order 12898, established Environmental Justice as a Federal agency priority to ensure that minority and low-income groups are not disproportionately affected by Federal actions. Implementation of the Proposed Action would not disproportionately (unequally) affect any low-income or minority communities within the project area. The reason for this is that the proposed project would not involve major facility construction, population relocation, health hazards, hazardous waste, property takings, or substantial economic impacts. This action would therefore have no adverse human health or environmental effects on minority and low-income populations as defined.

3.7 Cumulative Effects

In addition to project-specific impacts, Reclamation analyzed the potential for significant cumulative impacts to resources affected by the project and by other past, present, and reasonably foreseeable activities within the watershed. According to the Council on Environmental Quality's regulations for implementing NEPA (50 CFR §1508.7), a “cumulative impact” is an impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. It focuses on whether the Proposed Action, considered together with any known or reasonably foreseeable actions by Reclamation, other Federal or state agencies, or some other entity combined to cause an effect. There is no defined area for potential cumulative effects.

Based on Reclamation and UDWR resource specialists’ review of the Proposed Action Alternative, Reclamation has determined that this action would not have a significant adverse cumulative effect on any resources.

Chapter 4 Environmental Commitments

The following environmental commitments would be implemented as an integral part of the Proposed Action.

1. **Standard Reclamation Management Practices** - Standard Reclamation management practices would be applied during construction activities to minimize environmental effects and would be implemented by Reclamation construction forces, or included in construction specifications. Such practices or specifications include sections in the present report on public safety, dust abatement, air pollution, noise abatement, water pollution abatement, waste material disposal, erosion control, archaeological and historical resources, vegetation, and wildlife. All public access roads used during construction would be repaired if needed before construction contractors leave the project area.

2. **Additional Analyses** - If the Proposed Action were to change significantly from that described in the EA, because of additional or new information, or if other construction areas are required outside the areas analyzed in this EA, additional environmental analysis including cultural and paleontological analyses would be undertaken if necessary.

3. **Utah Pollutant Discharge Elimination System Pesticide General Permit -** This permit would be obtained by the UDWR from the UDEQ before any pesticide discharges were made into Red Fleet Reservoir or Brush Creek. This permit complies with Section 402 of the CWA for actions involving the discharge of pollutants into waters of the state of Utah.

4. **Construction Restrictions** - Treatment and staging activities would be confined to previously disturbed areas, to the extent practicable.

5. **Public Access** – Activity areas would be closed to public access during treatment. Reclamation and the UDWR would coordinate with State Parks personnel, as necessary, to ensure public safety.

6. **Invasive Species** - Appropriate steps would be taken to prevent the spread of, and to otherwise control undesirable plants and animals within areas affected by construction activities. Equipment used

for the project would be inspected for reproductive and vegetative parts, foreign soil, mud or other debris that may cause the spread of weeds, invasive species and other pests. Such material would be removed before moving vehicles and equipment onto any Federal land. Upon the completion of work, decontamination would be performed within the work area before the vehicle and/or equipment are removed from Federal project lands.

7. **Vegetation** - Design and treatment activities would ensure that vegetation would be protected with no long term adverse effects. Staging areas would be in previously disturbed areas to the extent possible.

8. **Raptor Guidelines** – UDWR would adhere to the Romin and Muck (2002) Utah, raptor guidelines by placing seasonal and spatial "no construction" buffers, along with daily timing restrictions around all active raptor nests or winter roosting bald eagles. If unknown nests are located during construction, the same guidelines would be implemented.

9. **Water Quality** – The Division of Drinking Water approves the application under the following conditions: DNR's application be in accordance with the manufacturer's recommendation; DNR's application occur after CUWCD ceases use of the Reservoir at the end of the 2015 Summer season; and DNR receive confirmation from CUWCD that they have ceased use of the Red Fleet Reservoir for the 2015 season, prior to the rotenone application.

Chapter 5 Consultation and Coordination

5.1 Introduction

This chapter details the consultation and coordination between Reclamation, UDWR, and other Federal, state, and local Government agencies, Native American Tribes, and the public during the preparation of this EA. Compliance with NEPA is a Federal responsibility that involves the participation of all of these entities in the planning process. NEPA requires full disclosure about major actions taken by Federal agencies and accompanying alternatives, impacts, and potential mitigation of impacts.

5.2 Public Involvement

UDWR has coordinated with all cooperators on this Proposed Action including: Utah State Parks, Reclamation, the Central Utah Water Conservancy District, the Uintah Water Conservancy District, the U.S. Fish and Wildlife Service, the Upper Colorado Endangered Fish Recovery Program, the U.S. Bureau of Land Management, Vernal City, and Uintah County.

Scoping began with a public meeting on January 15, 2013. Over 40 people attended this meeting and provided comments. Over the course of the next few months, UDWR collected additional comments from individuals submitting through the Division front desk. Appendix B is a compilation of all comments received during this initial scoping period. The EA team, comprised of representatives from all pertinent agencies, met on January 8, 2015, reviewed the comments received, reviewed the proposal, and analyzed resources that would be impacted by the project.

UDWR solicited comments via newspaper article on February 19, 2015, a "Utah Reservoir Fisheries" blogpost on January 31, 2015, and multiple public meetings including a presentation to Vernal City on April 1, 2015, and Uintah County on April 7, 2015 on the scope of the Proposed Action. Three comments were received. Comments were considered and pertinent comments were incorporated into this Draft EA.

A public scoping meeting was held on April 8, 2015 at the UDWR office in Vernal, Utah. Sixteen members of the public attended and questions regarding the project were answered and instructions on how to provide comments as detailed in the scoping letter were reviewed. No new comments were received during this meeting.

Reclamation invites interested parties to comment on this Draft EA. This notice is being sent to municipalities, organizations, agencies, and the public with interest in the project for a 30-day comment period. Comments are due by July 22, 2015. All comments will be considered and when appropriate addressed in finalizing the EA.

Interested parties may view a copy of the Draft EA on the internet at www.usbr.gov/uc/envdocs/index.html. They may also obtain a CD or hard copy by calling or submitting a written request to Ms. Trina Hedrick, Utah Division of Wildlife Resources, Vernal Field Office. The address is 318 North, Vernal Ave., Vernal, Utah 84078, phone number 435-781-9453 or e-mail: fishnero@utah.gov. Summary of scoping issues are in Section 1.4.

Chapter 6 Preparers

The following are contributors to the Draft EA

Name	Agency	Position Title	Contribution
Mr. Carl Adams	UDEQ	Watershed Protection Section Manager	Water Quality
Ms. Linda Andra	Reclamation	Secretary	Visual Identity, Editing
Mr. Rick Baxter	Reclamation	Fish and Wildlife Biologist	ESA Compliance. Wildlife Resources
Mr. Garn Birchell	UDWR	Fisheries Biologist	Wildlife Resources
Mr. Scott Blake	Reclamation	Recreation Specialist	Recreation, Visual Resources
Ms. Natalie Boren	UDWR	Fisheries Biologist	Wildlife Resources
Mr. Gary Carlson	Reclamation	Mechanical Engineer	Public Safety, Access, and Transportation; System Operations
Mr. Peter Crookston	Reclamation	Environmental Protection Specialist	Environmental Assessment Coordinator, NEPA Oversight
Mr. Bryan Engelbert	UDWR	Fisheries Biologist	Wildlife Resources
Mr. Scott Hacking	UDEQ	Engineer	Water Quality
Mr. Jeff Hearty	Reclamation	Economist	Economics
Ms. Trina Hedrick	UDWR	Northeastern Regional Aquatics Manager	Project Manager, Project Oversight
Mr. Calvin Jennings	Reclamation	Archaeologist	Cultural Resource, Paleontological Resource, Indian Trust Assets
Mr. Ryan Luke	Reclamation	Chief, Operations, Emergency Management Group	Water Resources, System Operations
Mr. Robert Radtke	Reclamation	Water Quality Specialist	Water Quality
Ms. Beth Reinhart	Reclamation	Chief, Environmental Group	Project Oversight
Mr. Kerry Schwartz	Reclamation	Manager, Water and Environmental	Project Oversight
Mr. David Snyder	Reclamation	Fish and Wildlife Biologist	CWA Compliance, Wetlands

Chapter 7 References

American Fisheries Society, Fish Management Chemicals, Subcommittee Task Force on Fishery Chemicals. *Better Fishing Through Management: How Rotenone Is Used to Help Manage Our Fishery Resources More Effectively.* www.fws.gov/mountain-prairie/federalassistance/native_trout/rotenonebro.pdf

Boren, N. 2012. Illegal Fish Introductions: Comprehensive Analysis of the Effects of Walleye at Red Fleet Reservoir, Utah. Capstone project, part II, Utah State University.

Bradbury, A. 1986. Rotenone and trout stocking. A literature review with special reference to Washington Department of Game's Lake Rehabilitation Program. Fisheries Management Report 86-2. 181 pp.

California Department of Fish and Game. 1994. Rotenone use for fisheries management. Final programmatic environmental impact report (subsequent). Sacramento, CA. 334 pp.

Canonico, G.C., Arthington, A., McCrary, J.K. and M.L. Thieme. 2005. The effects of introduced tilapias on native biodiversity. Aquatic Conservation: Marine and Freshwater Ecosystems 15: 463–483.

Carlson, R. E. (1977, March). A Trophic State Index for Lakes. *Limnology and Oceanography , 22* (2), pp. 361-369.

Central Utah Water Conservancy District (CUWCD), (July 2009). Drinking Water Source Protection Plan, CUWCD Ashley Valley Water Treatment Plant, Red Fleet Reservoir Watershed.

Courtenay, W.R. Jr. 1993. Biological pollution through fish introductions In Biological pollution: the control and impact of invasive exotic species, Edited by: McKnight, B.N. 35–61. Indianapolis: Indiana Academy of Science.

Courtenay, W.R. Jr. and Robins, C.R. 1989. Fish introductions: good management, mismanagement, or no management. Reviews in Aquatic Sciences 1: 159–172.

Crosby, C.W. and F. Bartlett. 1998. Aquatic Management Plan Ashley Creek Drainage (Utah) Hydrologic Unit Code 14060002. Salt Lake City, UT. 34pp.

Dinger, E.C. and J.C. Marks. 2007. Effects of high levels of Antimycin A on aquatic invertebrates in a warmwater Arizona stream. North American Journal of Fisheries Management 27: 1243-1256.

Elton, C.S. 1958. The ecology of invasions by animals and plants, London: Chapman and Hall.

Engstrom-Heg, R., R. T. Colesante, and E. Silco. 1978. Rotenone Tolerances of Stream-bottom Insects. New Your Fish and Game Journal 25(1):31-41.

Fayrum, A.H., M.J. Hansen, and T.J. Ehlinger. 2005. Interactions between walleyes and four fish species with implications for walleye stocking. North American Journal of Fisheries Management 25: 1321-1330.

Finlayson, B. J., R. A. Schnick, R. L. Cailteaux, L. DeMong, W. D. Horton, W. McClay, C. W. Thompson, and G. J. Tichacek. 2000. Rotenone use in fisheries management; administrative and technical guidelines manual.

Gibbins, C., D. Vericat and R.J. Batalla. 2007. When is stream invertebrate drift catastrophic? The role of hydraulics and sediment transport in initiating drift during flood events. Freshwater Biology 52:2369-2384.

Holdaway, B., Utah Division of Drinking Water 2010. E-mail communication to M. McKell. May 18, 2010.

Hynes, H. B. N. 1972. The Ecology of Running Waters. University of Toronto Press, Toronto. 555 pp.

Johnson, B.M., B. Wolff, and P.J. Martinez. 2014. Chemically fingerprinting nonnative fish in reservoirs. Upper Colorado River Endangered Fish Recovery Program report for project number C-18/19.

Knight, R.L., F.J. Margraf, and R.F. Carline. 1984. Piscivory in walleye and yellow perch in western Lake Erie. Transactions of the American Fisheries Society 113(6): 677-693.

Kolar, C.S., D.H. Wahl, and M.L. Hooe. 2003. Piscivory in juvenile walleyes: Relative importance of prey species, timing of spawning of prey fish, and density on growth and survival. Transactions of the American Fisheries Society 132(4): 679-690.

Laycock, G. 1966. The alien animals, Garden City, New York.: Natural History Press.

Lyons, J. and J.J. Magnuson. 1987. Effects of walleye predation on the population dynamics of small littoral-zone fishes in a northern Wisconsin lake. Transactions of the American Fisheries Society 116(1): 29-39.

Mangum, F.A. and J.L. Madrigal. 1999. Rotenone effects on aquatic macroinvertebrates of the Strawberry River, Utah: A five-year study. Journal of Freshwater Ecology 14: 125-135.

Marmonier, P., M.J. Dole-Oliver, J.L. Beffy. 1997. Response of invertebrates to lotic disturbance: Is the hyporheic zone a patchy refugium? Freshwater Biology 37:257-276. National Academy of Science. 1983. Rotenone. Pages 63-70 in Drinking water and health, Volume 5. Safe Drinking Water Committee, Board on Toxicology and Environmental Health Hazards, Commission on Life Sciences, National Research Council, National Academy Press, Washington, D. C.

Mathias, J.A. and S. Li. 1982. Feeding habits of walleye larvae and juveniles: comparative laboratory and field studies. Transactions of the American Fisheries Society 111:722-735.

Maxfield 2012 -- not sure of this citation, but saw it in the text.

Minckley, W.L. 1991. Native fishes of the Grand Canyon region: An obituary?. Colorado River ecology and dam management: Proceedings of a symposium, May 24–25, 1990, Santa Fe, New Mexico pp.124–177. Washington, D.C.: National Academy Press. Committee to Review the Glen Canyon Environmental Studies, Water Science and Technology Board, National Research Council.

Minckley, W.L. and J.E. Deacon. 1968. Southwestern fishes and the enigma of "endangered species." Science 159: 1424–1432.

Moyle, P.B. 1976. Fish introductions in California: history and impact on native fishes. Biological Conservation 9: 101–118.

Smith, L.L.,Jr.and R.L. Pycha. 1960. First year growth of walleye and associated factors in the Red Lakes, Minnesota. Limnology and Oceanography 5:281-290.

Sousa, Robert J., Fred P. Meyer and Rosalie A. Schnick. 1987. Better fishing through management. U.S. Fish and Wildlife Service, Washington, D. C.

Taylor, J.N., Courtenay, W.R. Jr. and J.A. McCann. 1984. Known impacts of exotic fishes in the continental United States. In Distribution, biology, and management of exotic fishes, Edited by: Courtenay, W. R. and J.R. Stauffer. 322–373. Baltimore, Maryland: Johns Hopkins University Press.

Turner, L., S. Jacobson, and L. Shoemaker. 2007. Risk Assessment for Piscicidal Formulations of Rotenone. Compliance Services International report to Washington Department of Fish and Wildlife. Lakewood, WA, 104 pp.

USEPA (United States Environmental Protection Agency). 2007. Reregistration eligibility decision for rotenone. Document EPA 738-R-07-007(M Stormyh 2007). United States Environmental Protection Agency, Washington, D.C.

Utah Division of Water Quality, (August 2008). Total Maximum Daily Load Water Quality Study: Brough, Red Fleet, and Steinaker Reservoirs. Prepared by Millennium Science & Engineering and Limno-Tech, Inc.

Utah Division of Water Quality, Utah's 2012-2014 Draft Integrated Report: Online, http://www.deq.utah.gov/ProgramsServices/programs/water/wqmanagement/assessment/currentIRoct.htm, accessed April 2015.

Utah Division of Water Quality, Watersheds: Lakes and Reservoirs: Online, http://www.deq.utah.gov/ProgramsServices/programs/water/watersheds/watersheds/docs/2006/08Aug/REDFLEET.pdf, accessed April 2015.

Utah Division of Water Quality, Utah Mercury Fish Advisories: Online, http://fishadvisories.utah.gov/, accessed April 2015.

Vinson, M.R., E.C. Dinger and D.K. Vinson. 2010. Piscicides and invertebrates: After 70 years, does anybody really know? Fisheries 35: 61-71.

Whelan, J. E. 2002. Aquatic macroinvertebrate monitoring results of the 1995 and 1996 rotenone treatments of Manning Creek, Utah. Publication Number 02-04. Utah Division of Wildlife Resources, Salt Lake City, UT. 34pp.

Appendix A

Angler Survey Responses

Appendix B

Scoping Responses

Appendix C

Comment Letter