BUREAU OF RECLAMATION

Big Sandy Reservoir Rotenone Treatment, Final Environmental Assessment and Finding of No Significant Impact

Sublette and Sweetwater Counties, Wyoming

PRO-EA-21-002
Interior Region 7 – Upper Colorado Basin
Provo Area Office
Provo, Utah

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U.S. Department of the Interior **March 2021**

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

FINDING OF NO SIGNIFICANT IMPACT

Big Sandy Reservoir Rotenone Treatment
Sublette and Sweetwater Counties, Wyoming

EA-21-002

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I. Introduction

In compliance with the National Environmental Policy Act of 1969, as amended (NEPA), and the Council on Environmental Quality's regulations implementing NEPA at 40 CFR 1500-1508 that went into effect September 14, 2020, the U.S. Bureau of Reclamation (Reclamation), Provo Area Office conducted an Environmental Assessment (EA; attached) to examine the potential environmental impacts of the Big Sandy Rotenone Treatment Project (Project or Proposed Action) in Sweetwater and Sublette counties, Wyoming. The Project is proposed by the Wyoming Game and Fish Department (WGFD). If the Project is approved, Reclamation would authorize WGFD to apply a rotenone treatment in Big Sandy Reservoir. The rotenone treatment is intended to allow WGFD to "reset" the fishery in Big Sandy Reservoir, making it a more desirable angling destination.

II. Proposed Action

The Proposed Action is to treat Big Sandy Reservoir with powdered and emulsified rotenone at a concentration of 2 ppm to eradicate illegally introduced burbot and non-native white sucker. Additional description of the Proposed Action is found in section 2.3 of the final EA.

III. Summary of Effects

As described in the EA, there would be no significant effects on water quality, or any other resources considered in the EA.

IV. Environmental Commitments

Section 4 of the EA contains environmental commitments that are essential to the Proposed Action. WGFD is responsible for incorporating all environmental commitments listed in section 4 as the Project is carried out.

V. Decision

Based on the foregoing information, Reclamation has determined that the Proposed Action will not have a significant effect on the human and natural environment. It is Reclamation's decision, therefore, to issue this FONSI pursuant to NEPA and its implementing regulations at 40 CFR 1500-1508, and authorize the Proposed Action to be implemented.

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1 Introduction

1.1 Background

This Environmental Assessment (EA) was prepared to examine the potential environmental impacts of the Big Sandy Rotenone Treatment Project (Project or Proposed Action) in Sweetwater and Sublette counties, Wyoming. The Project is proposed by the Wyoming Game and Fish Department (WGFD). If the Project is approved, the Bureau of Reclamation (Reclamation) would authorize WGFD to apply a rotenone treatment in Big Sandy Reservoir. The rotenone treatment is intended to allow WGFD to "reset" the fishery in Big Sandy Reservoir, making it a more desirable angling destination.

Big Sandy Reservoir is impounded by Big Sandy Dam on the Big Sandy River that travels through southwest Wyoming. Big Sandy Reservoir is a major storage facility of the Eden Project (Figure 1-1) which was authorized by the Colorado River Storage Project Act of April 11, 1956 (70 Stat. 105), as amended. Big Sandy Reservoir is located on Big Sandy Creek approximately 45 miles northwest of Rock Springs and approximately 10 miles north of Farson, Wyoming. Big Sandy Reservoir has a total storage capacity of 38,600 acre-feet (based on a 2010 bathymetric survey and 2015 LiDAR survey data) and a surface area of approximately 2,510 acres at water surface elevation 6,757.5 feet (Figure 1-1).

Reclamation has prepared this EA to comply with procedural requirements of the National Environmental Policy Act of 1969 (NEPA) and regulations outlined by the Council on Environmental Quality (implemented September 14, 2020) and Department of the Interior. This EA analyzes the potential impacts of the Proposed Action in comparison with the No Action Alternative. Under the No Action Alternative, WGFD would not apply the rotenone treatment to Big Sandy Reservoir; the fishery would remain unchanged, and the reservoir would continue to be a less desirable destination for angling. As required by the NEPA implementing regulations, if significant impacts to the human environment are identified, an Environmental Impact Statement will be prepared. If no significant impacts are identified, Reclamation will issue a Finding of No Significant Impact (FONSI).

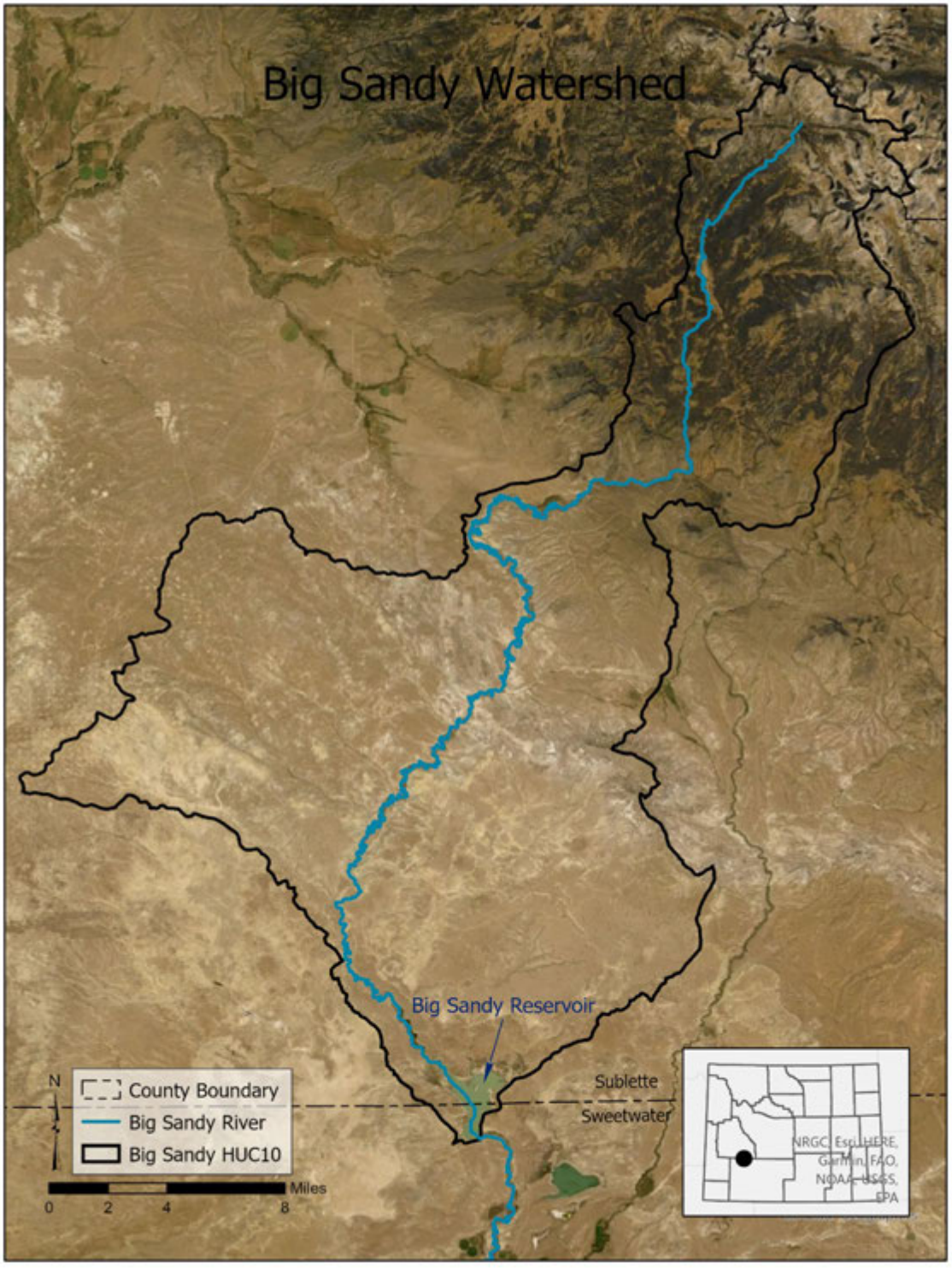

Figure 1-1 Map of Big Sandy Watershed

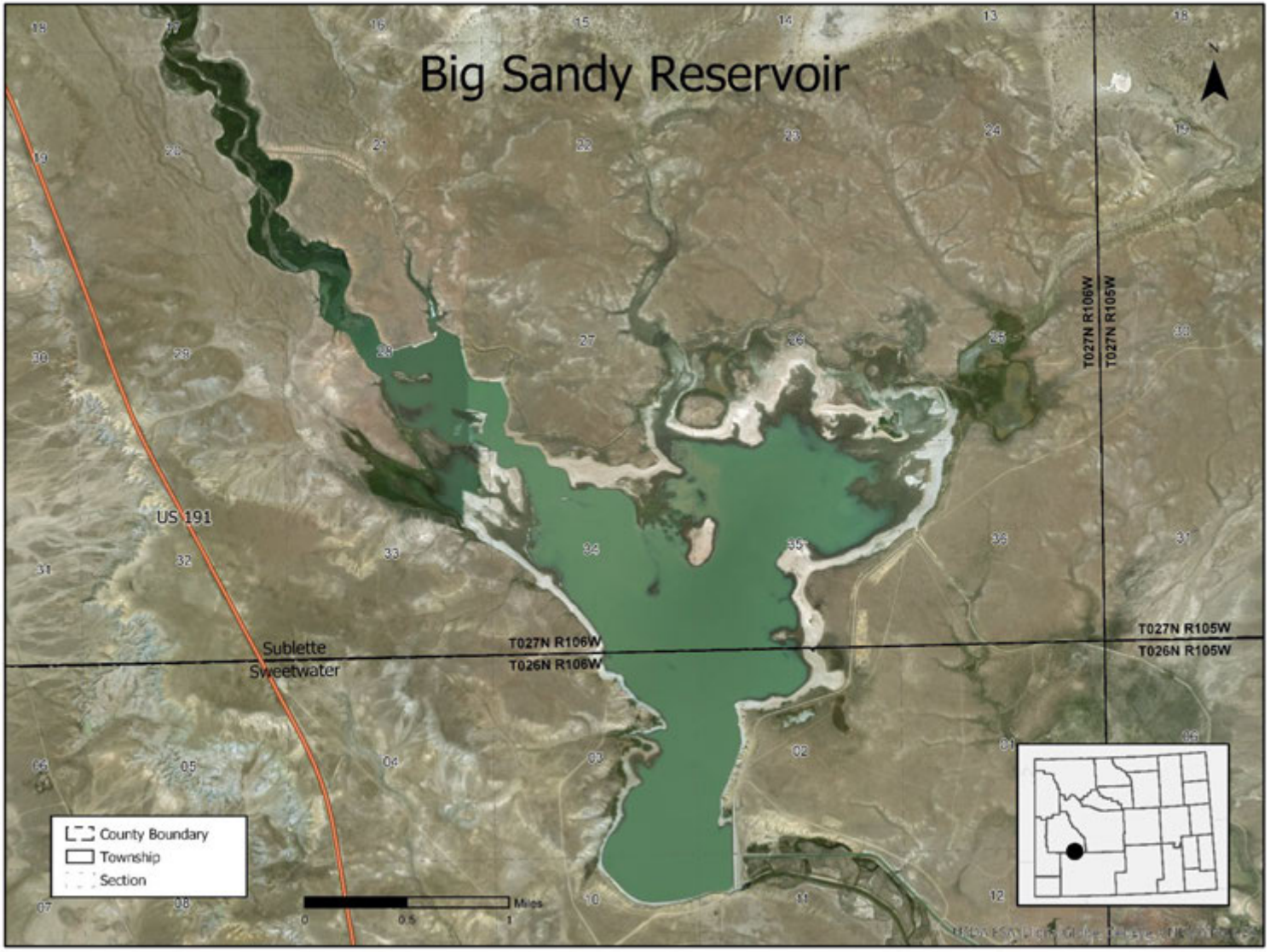

Figure 1-2 Big Sandy Reservoir in Southwest Wyoming

1.2 Statement of Purpose and Need

The purpose of the Proposed Action is to eliminate white sucker (*Catostomus commersoni*) and burbot (*Lota lota*) from Big Sandy Reservoir. A rotenone treatment would eliminate the competition, predation, and potential water quality threats these species pose to sport fish and would allow the WGFD to re-establish a quality fishery. Additionally, elimination of these problematic, non-native species would reduce the threat of them harming flannelmouth sucker (*Catostomus latipinnus*) and bluehead sucker (*Catostomus discobolus*) restoration efforts in the Big Sandy River upstream of the reservoir. Draining of the reservoir to near dead pool to facilitate the Big Sandy Enlargement Project provides a unique opportunity to reset the fishery at a significantly reduced cost.

The need for the Proposed Action arises from the proliferation of non-native white sucker and more recent illegal introduction of non-native burbot in the reservoir, which has made Big Sandy Reservoir a less desirable destination for angling.

1.3 Federal Decision

The federal decision to be made is whether Reclamation should authorize WGFD to implement the Proposed Action.

1.4 Permits 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.

1. Wyoming Pollution Discharge Elimination System (WYPDES) Pesticide General Permit (Authorization WYG480036). This permit authorizes the point source discharge of piscicides to approved waters by certified applicators of the Wyoming Game and Fish Department. This permit from the Wyoming Department of Environmental Quality will include a notice of intent for discharge to Big Sandy reservoir in 2021 and complies with Section 402 of the Clean Water Act for actions involving the discharge of pollutants into waters of the state of Wyoming.

1.5 Other Projects near the Project Area

The proposed treatment of Big Sandy Reservoir would immediately follow the treatment of approximately 60 miles of the Big Sandy River upstream of the reservoir, which will eliminate non-native fish species from the system in order to restore native bluehead sucker and flannelmouth sucker populations. It is important to note that the rotenone treatment upstream of Big Sandy Reservoir is not subject to Federal approval (i.e., it can and would be implemented independent of the Proposed Action) and, therefore, is not part of the Proposed Action in this EA.

2 Alternatives

2.1 Introduction

This chapter describes the features of the No Action and Proposed Action Alternatives and includes a description of each alternative considered. It presents the alternatives in comparative form, defining the differences between each alternative.

2.2 No Action

Under the No Action Alternative, the Proposed Action would not be implemented. Big Sandy Reservoir would not be treated with powdered and emulsified rotenone at a concentration of 2 parts per million (ppm) to eradicate illegally introduced burbot and non-native white sucker.

2.3 Proposed Action (Preferred Alternative)

The Proposed Action is to treat Big Sandy Reservoir with powdered and emulsified rotenone at a concentration of 2 ppm to eradicate illegally introduced burbot and non-native white sucker. The treatment would be reservoir-wide and would include the application of rotenone in a grid pattern, by boat, throughout the reservoir. Three drip stations will also be positioned on the Big Sandy River between the permanent fish migration barrier on the Big Sandy River (approximately seven stream miles upstream of Big Sandy Reservoir; 42° 19' 46" N; 109° 30' 42" W) and Big Sandy Reservoir. This will ensure no fish from the reservoir survive by entering this section of the river. Due to the Big Sandy Enlargement Project, no water will be released from the dam from mid-September (once the target water elevation is achieved) until spring. Therefore, there is no plan to detoxify the reservoir with potassium permanganate. Instead of using this compound to expedite detoxification, the rotenone in the reservoir will be allowed to break down naturally and dilute as the reservoir fills with fresh water from Big Sandy River. All aspects of the treatment will be consistent with Standard Operating Procedures (SOP) outlined by the American Fisheries Society (Finlayson et al. 2018). There will be no ground disturbance and no change in dam operations associated with the Proposed Action.

2.3.1 Pre-treatment

Big Sandy Reservoir is managed as a basic yield brown trout (*Salmo trutta*) fishery (WGFD 2017a). Both brown trout and rainbow trout (*Oncorhynchus mykiss*) are annually stocked in the reservoir. Channel catfish (*Ictalurus punctatus*) also flourished in the reservoir at one time, but they have not been stocked since the illegal introduction of burbot in the late 1980s. Historically, the reservoir was a popular destination for local anglers to target quality brown trout. More recently, anglers often complain about low brown trout and high white sucker catch rates. The most recent fish survey was conducted in June 2019. The dominant fish species in this survey was white sucker (80% of combined floating and sinking gillnet catch). Rainbow trout comprised 15% and brown trout comprised 3% of the catch. Burbot comprised <1% of the catch but are not as susceptible to

gillnets and are considered abundant in the system. Channel catfish are also present in the reservoir despite not being represented in the catch. Fish species anticipated to be killed in the treatment (from highest to lowest abundance) include white sucker, burbot, rainbow trout, brown trout, flannelmouth x white sucker hybrids, channel catfish and flannelmouth sucker. Based on drainage-wide surveys conducted from 2002-2006 (Gelwicks et al. 2009), additional fish species that may be present in the reservoir include native bluehead sucker, mottled sculpin (*Cottus bairdi*), mountain sucker (*Catostomus platyrhynchus*), mountain whitefish (*Prosopium williamsoni*), and speckled dace (*Rhinichthys osculus*), as well as non-native brook trout (*Salvelinus fontinalis*), common carp (*Cyprinus carpio*), fathead minnow (*Pimephales promelas*), lake chub (*Couesius plumbeus*), longnose dace (*Rhynichthys cataractae*), longnose sucker (*Catostomus catostomus*), redside shiner (*Richardsonius balteatus*), and Utah chub (*Gila atraria*).

Initial planning for the treatment is underway, although finalized chemical needs remain as estimates until WGFD knows inflow rate and the volume of water in the reservoir at the exact time of the treatment. Anticipated amounts of rotenone to be used are based on a reservoir capacity of 4,000 acre-feet and inflow from the Big Sandy River of 24 cubic feet per second (cfs). A treatment of this volume of water will require two boats, each with three operators. In addition, three people will operate drip stations on the Big Sandy River between the fish migration barrier and Big Sandy Reservoir, one person will be on hand to help keep the public out of the project area, one individual will act as the main point of contact for all personnel, and six additional personnel will remain on shore at the access site to distribute rotenone to application teams on the water. Ensuring treatment containment is of the upmost importance. Should any treated water need to be released from the dam, a reserve supply of potassium permanganate will be onsite to ensure any treated water that is released is detoxified immediately below the dam.

Rotenone and potassium permanganate will be stored at the WGFD Green River Regional Office 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 the Big Sandy River will be measured and the volume of Big Sandy Reservoir will be obtained from the Bureau of Reclamation. In addition, closure of the outflow will be verified with the Bureau of Reclamation. One day before the treatment, inflow and reservoir volume will be verified to ensure that planned rotenone amounts for distribution are still appropriate.

2.3.2 Treatment

Application of rotenone would occur in one day. The target date for treatment of Big Sandy Reservoir is the last week of September 2021. This would follow the treatment of Big Sandy River (upstream of the reservoir) and the closure of reservoir outlet works (both scheduled for mid-September). At that time, it is anticipated that the reservoir elevation will be 6,730 feet to allow for dam construction activities. This will result in an expected reservoir capacity of 4,100 acre-feet. The day prior to treatment, WGFD personnel will deliver all rotenone and equipment to the west side of Big Sandy Reservoir. Treatment will begin at 8:00am on the day of treatment and will continue until all powdered rotenone is applied, which is expected to be 6 hours.

The reservoir will be accessed on the west shoreline to avoid interfering with dam construction activities. Two boats will be launched on the west side of the reservoir with each boat driving a pre-determined grid pattern to distribute powdered rotenone. Concurrent with boat activities, three drip stations will be operated between the fish migration barrier (located upstream of the reservoir) and

the reservoir. These drip stations will dispense emulsified rotenone into the river, alleviating the ability of fish to seek refuge upstream of the reservoir during treatment. It is estimated that 21,700 pounds of powdered rotenone and 15 gallons of 5.17 emulsified rotenone (Prenfish) will be applied.

Jon boats equipped with outboard motors will be used to apply rotenone to the reservoir. All applicators will wear appropriate personal protective equipment (gloves, Tyvek suits, and eye protection for all applicators; respirators for all boat operators and powdered rotenone applicators). Application of rotenone will be supervised by applicators possessing a valid State of Wyoming Pesticide Applicator Permit. Additionally, the Project Supervisor will have participated in all planning and field aspects of a minimum of two previous rotenone projects and will have supervised a minimum of one aspect of a previous application (Finlayson et al., 2018).

Dispersal of powdered rotenone would start at the same time as the drip station on the Big Sandy River. Although dependent on temperature and inflow from the Big Sandy River, it is expected that rotenone will persist in the reservoir for at least one month. Since the outlet works will be closed, no chemical detoxification will be necessary as the rotenone will be allowed to break down naturally and dilute as the reservoir fills. An emergency reserve of potassium permanganate will be on site should the need to release water occurs before the chemical breaks down naturally. The detoxification site would be located immediately below the reservoir.

In the event of an accidental spill of rotenone or $KMnO_4$, the Project Supervisor will be responsible for reporting it. Wyoming Water Quality Rules and Regulations, Chapter 4, requires that the WQD be notified of any oil or hazardous substances which have been released and which enter, or threaten to enter, waters of the state. Spills can be reported to WDEQ by calling 307-777-7501 or through the following website: http://wyospills.org/.

2.3.3 Post-treatment

Immediately following treatment, walking and boat surveys will be conducted to ascertain the effectiveness of the treatment and visually estimate relative abundance of species killed. Fish carcasses will be allowed to sink in the reservoir and decompose naturally. If dead fish are found washed up on banks, attempts to collect them will be made so they can be eviscerated and moved to deeper water where they can decompose.

In the spring or summer of 2022, trout will be re-stocked in the reservoir. Rainbow trout and brown trout will be the primary species stocked, but other trout species and channel catfish may be considered as well. Gillnetting surveys will be conducted in summer of 2022 and periodic monitoring of the fishery will resume thereafter to measure effectiveness of the treatment as well as performance of stocked fish.

2.4 Alternatives Considered and Eliminated from Further Study

The following alternatives were evaluated but eliminated because they would not successfully meet the need for the project or tend to be ineffective or less effective methods of accomplishing the purpose of the Proposed Action.

2.4.1 Mechanically Remove Non-native Fish Species from Reservoir

Mechanical removal of non-native white sucker and burbot would not be feasible as it would require tremendous effort to impact the population in any way and would further require annual efforts into perpetuity to keep populations in check. These efforts would far exceed the capacity of the WGFD to conduct and would likely be ineffective.

2.4.2 Introduce Predators to Control Non-native Fish Species

Attempts have been made in other Wyoming waters and elsewhere to control unwanted species such as white sucker with an introduction of a predator species. In Wyoming, stocking of predatory fish such as tiger musky (*Esox masquinongy x Esox lucius*), splake (*Salvelinus fontinalis x Salvelinus namaycush*), and tiger trout (*Salmo trutta x Salvelinus fontinalis*) has been attempted as a tool to control white sucker. While these efforts may have shown limited success in a small number of cases, it is not considered a feasible method to control white sucker and burbot in a reservoir the size of Big Sandy Reservoir.

3 Affected Environment and Environmental Consequences

This chapter describes the environment that could be affected by the Proposed Action, including those that were considered but eliminated from detailed study. For those resources that were analyzed in detail, the present condition or characteristics of each resource are discussed first, followed by a discussion of the predicted impacts caused by the No Action and the Proposed Action.

3.1 Resources Considered but Eliminated from Detailed Analysis

The following resources were considered but eliminated from further analysis because they did not occur in the Project area or because their effect is so minor (negligible) that it was discounted (Table 3-1).

Table 3-1 Resources Considered but Eliminated from Detailed Analysis

Resource	Rationale for Considering but Eliminating from Detailed Analysis
Geology and Soils	There are no important geological features in the Project area and soils would be managed following the environmental commitments in chapter 5. Therefore, there would be no significant impact to geology and soil resources.
Hydrology	The Proposed Action is intentionally being implemented when flows will already be regulated for the Big Sandy Reservoir Enlargement Project. Therefore, this Proposed Action would be no additional effect to hydrology.
Water Rights	No changes to water rights are being proposed under the Project. Therefore, there would be no effects to water rights.
Wetlands and	Vegetation is not affected by rotenone and no dewatering is planned as part of

Riparian	the Project beyond that already planned for the Big Sandy Reservoir Enlargement Project. Therefore, there would be no effect to wetlands and riparian resources.
Paleontological	There are no ground disturbing components to the Proposed Action that would disturb paleontology resources. Therefore, there would be no effect to paleontological resources.
Socioeconomics	WGFD is responsible for all costs associated with the Project. Therefore, there would be no effect to the socioeconomics of the area.
Threatened and Endangered Species	No threatened or endangered species occur in the Project area, nor would there be any indirect effects to such species. Therefore, Reclamation made a "no effect" determination under the Endangered Species Act.
Wilderness, and Wild and Scenic Rivers	There are no designated wilderness areas or wild and scenic rivers within the Project area; therefore, there would be no impact to these resources from the Proposed Action.
Prime and Unique Farmlands	There is no Prime and Unique Farmland within the Project area. Therefore, there would be no impacts to this resource from the Proposed Action.
Recreation	The Project would have a beneficial effect on recreation, particularly angling at Big Sandy Reservoir. This may slightly increase visitation rates and improve visitor experience to the area. This effect is not expected to be significant in the context of NEPA because it is not expected that visitation rates would dramatically increase at Big Sandy Reservoir.
Visual	The Project would have no impacts to visual aesthetics because the Project would not be visible to the public.
Health, Safety, Air Quality, Noise	Effects to these resources would be negligible due to the nature of rotenone and the proposed application rates.

3.2 Water Quality

Presently the water quality of the Big Sandy River below Big Sandy Reservoir meets the State of Wyoming's surface water quality standard criteria and is listed as a 2AB water (Wyoming Department of Environmental Quality Water Quality Rules and Regulations, Chapter 1, Wyoming Surface Water Quality Standards, 2018). Class 2AB waters are those known to support game fish populations or spawning and nursery areas at least seasonally and all their perennial tributaries and adjacent wetlands and where a game fishery and drinking water use is otherwise attainable. Class 2AB waters include all permanent and seasonal game fisheries and can be either "cold water" or "warm water" depending upon the predominance of cold water or warm water species present. All Class 2AB waters are designated as cold water game fisheries unless identified as a warm water game fishery by a "ww" notation in the *Wyoming Surface Water Classification List*. Unless it is shown otherwise, these waters are presumed to have sufficient water quality and quantity to support drinking water supplies and are protected for that use. Class 2AB waters are also protected for nongame fisheries, fish consumption, aquatic life other than fish, recreation, wildlife, industry, agriculture, and scenic value uses.

Big Sandy Reservoir currently has a capacity of 39,700 acre-feet with a maximum depth of 65 feet and mean depth of approximately 19 feet. Substrate is predominantly sand and silt with some rip-rap

rock on the dam face. Maximum summer water temperatures are normally around 70F and no thermal stratification occurs. Water levels fluctuate a lot as the reservoir is usually drawn down by fall and remains low during winter months until spring runoff. Little rooted aquatic vegetation develops because of the extreme water level fluctuations.

Current information on Big Sandy Reservoir water quality is limited. Although the reservoir had relatively clear water initially, turbidity showed a marked increase in the late 1960s and has remained turbid since. Prior to 1969, secchi depths ranged from 2-8 ft, but decreased to 16 in by 1972 (Miller 1978). The high turbidity is due to erosive soils in the drainage contributing extremely fine silt to the reservoir and is considered a factor in historic brown trout population declines (Miller 1973). Total dissolved solids range from 77 to 156 ppm and pH is between 7.4 and 8.0 (Miller 1978). The Wyoming Department of Environmental Quality has monitored water quality at two sites on Big Sandy Reservoir in 2014. They also collected water quality data in 2018 and 2020 that indicated the presence of harmful cyanobacterial blooms in the reservoir. These data were used by the Wyoming Department of Health to issue recreational use advisories for Big Sandy Reservoir in 2018 and 2020.

3.2.1 Impacts on Water Quality

3.2.1.1 No Action

Under the No Action Alternative, the Project would not be implemented, and therefore would have no effect on water quality.

3.2.1.2 Proposed Action

The most immediate but short-term effect of the rotenone treatment to water quality will be the toxicity of the rotenone itself. Rotenone quickly degrades in the environment and water treated with rotenone will detoxify through natural dissipation processes (abiotic and biological). Persistence of rotenone is inversely related to water temperature, with residues persisting from one day to several weeks in most temperate environments (Finlayson et al. 2018). Given that the treatment is scheduled for late September when water temperatures are cooling, we expect the rotenone to be fully dissipated in 1-2 months.

Finlayson et al. (2001) summarized rotenone persistence in nine California lakes and streams. Their results indicated that the half-life of rotenone was inversely related to temperature and ranged from 0.6-7.7 days. The longest persistence (and coldest water temperatures) were found in Lake Davis, a reservoir at 5,886 ft elevation and a total volume of 84,371 acre-feet. The treatment was conducted in fall of 1997 at a capacity of 48,000 acre-feet and rotenone was allowed to naturally degrade in the lake. Monitoring was conducted across a temperature range of 33.8–53.6°F, pH of 7.5–9.2 and alkalinity of 31–42 mg/L $CaCO_3$. and results showed a half-life of rotenone in water of 7.7 days and dissipation to undetectable levels in 6 weeks (Finlayson et al. 2001). Lake Davis was treated with rotenone again in September 2007 when the reservoir was at a volume of 41,800 acre-feet (Vasquez 2012). Monitoring showed a half-life of rotenone in the water of 5.6 days and was undetectable in water by 35 days. Another study in Oregon measured the persistence of rotenone in Diamond Lake, a reservoir at 5,184 ft elevation and a total volume of 68,100 acre-feet (Finlayson et al. 2014). The treatment was conducted at a reservoir volume of 42,903 acre-feet in September 2006 during a phytoplankton (including cyanobacteria *Anabaena* sp.) bloom which resulted in an elevated pH of 9.7. Results showed that 75% of the rotenone was gone from the water within 2 days, the average half-life of rotenone in water was 4.5 days and it was undetectable in water at 39 days. The authors

credited the rapid decomposition of rotenone in this study to relatively high water temperatures (62–64°F) and the elevated pH.

Post-treatment water quality was not documented in any of these studies and virtually no published studies have directly measured the impacts of rotenone treatments and subsequent decomposition of fish on water quality. Decomposition of dead fish could increase nutrient inputs in the reservoir, but these impacts will be temporary. It is expected that fish will decompose within a period of weeks and these nutrients should help fuel phytoplankton, zooplankton, and benthic macro-invertebrate production (Finlayson et al. 2018). One study of a rotenone treatment in a 19 acre "barrow pit" documented a 57% decrease in dissolved oxygen immediately after treatment, followed by a 298% increase by the end of the first week (Peterson et al. 2011). However, the authors did not speculate about whether these changes could be attributed to decomposing fish. Anecdotally, biologists in Utah noted that fish were left to decompose after chemical treatments of Pelican Lake, and Red Fleet, Cottonwood, and Bullock Draw reservoirs with no observed nutrient loading or algal blooms (personal communication, Trina Hedrick, Utah Division of Wildlife Resources, Vernal, UT). Given the widespread use of rotenone in reservoirs throughout the United States, the common practice of leaving fish in water bodies to decompose and the lack of information on water quality issues induced by rotenone-killed fish decomposition, there is no evidence that leaving fish to decompose in Big Sandy Reservoir will have significant impacts on water quality. In addition, since the reservoir will be treated with rotenone at one tenth of its maximum volume and will begin refilling immediately after treatment, any impacts to water quality will be significantly diluted by inflow from the Big Sandy River by spring of 2022.

Various studies have documented improvements in water quality after rotenone treatment. A common result in many of these studies is an increase in water clarity and decrease in chlorophyll-a concentrations (Dawson et al. 1991, Prejs et al. 1997, Peterson et al. 2011). The increase in water clarity has often been attributed to elimination of benthic fishes that stir sediments into the water column. However, Dawson et al. (1991) observed a similar increase in water clarity following rotenone treatment of fishless ponds. Decreases in chlorophyll-a concentrations may be, in part, due to elimination or suppression of planktivorous fish that led to increased grazing by zooplankton on algae and phytoplankton (Prejs et al. 1997). Based on monthly water quality measurements taken for over one year post-treatment, Peterson et al. (2011) initially saw a decrease in water clarity and a corresponding 859% increase in chlorophyll-a in the days immediately following treatment. However, three weeks later, both had returned to pretreatment levels and one year later, water clarity increased by 332% and chlorophyll-a was only 16% of pre-treatment measurements. Regardless of the mechanisms, one expectation of a rotenone treatment of Big Sandy Reservoir could be an increase in water clarity in this historically turbid reservoir.

At the concentrations used to control fish, rotenone is not considered harmful to mammals and birds, whether through drinking treated water or through ingestion of dead fish. Concentrations of rotenone found to be toxic to terrestrial organisms are measured in the ppm range, whereas concentrations toxic to aquatic organisms are measured in the ppb range (Finlayson et al. 2018).

The effects to water quality during the project would not 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.

The impact of decomposing fish on aesthetics and recreators will be minimal. The treatment will take place during dam construction and the public will not be allowed access to the dam or boat ramps. At that time, the reservoir surface area will be reduced to approximately 403 acres (compared to 2,510 acres at full pool). The only public access allowed will be on the western shore and will involve walking a considerable distance to the water's edge. Fish carcasses on shorelines will be minimal (see Section 3.2.2) and will be inundated as the reservoir fills after treatment.

3.3 Fish and Wildlife Resources

Wildlife resources within the general area of the Project include mammals, birds, reptiles, amphibians, fish, and aquatic/semi-aquatic invertebrates. However, because rotenone only affects those species that pass oxygen across their gills, only gilled amphibians, fish, and aquatic invertebrates were considered in this section.

3.3.1 Environmental Baseline/Existing Conditions

3.3.1.1 *Amphibians*

Amphibian species known to occur in the general area include western tiger salamander (*Ambystoma mavortium*), Great Basin spadefoot (*Spea intermontana*), northern leopard frog (*Lithobates pipiens*) and boreal chorus frog (*Pseudacris maculate*) (Wendy Estes-Zumpf, WGFD Herpetologist, personal communication). Western tiger salamander, Great Basin spadefoot and northern leopard frog are all classified as Species of Greatest Conservation Need (SGCN) by the Wyoming Game and Fish Department. All are ranked as NSS4, indicating a population status of vulnerable with moderate limiting factors (WGFD 2017b). Boreal chorus frog are not classified as SGCN, and are ranked as NSS5, indicating a population status of stable with moderate limiting factors.

While their distribution and status in Big Sandy Reservoir is unknown, it is unlikely that they are present in the reservoir in significant numbers due to the lack of riparian vegetation and steep bank slopes, particularly when the reservoir is drawn down.

3.3.1.2 *Fish*

Big Sandy Reservoir

At least 11 fish species are known to occur in Big Sandy Reservoir, most of which are not native to the river basin (Table 3-2). The reservoir is primarily managed as a stocked brown trout and rainbow trout fishery (WGFD 2017a). Other sport fish in the reservoir include native mountain whitefish and non-native brook trout, cutthroat trout, and channel catfish, all of which are considered rare. Most anglers visit the Reservoir to catch brown trout and rainbow trout, both of which have been stocked in recent years by Wyoming Game and Fish Department (WGFD). In 2020, the WGFD stocked 7,000 brown trout and 22,000 rainbow trout (Table 3-3). Cutthroat trout were last stocked in 2004.

Table 3-2 Fish Species Occurrence in Big Sandy Reservoir

Species	Native	Abundance
Burbot	N	3 - Abundant

Species	Native	Abundance
Brook Trout	N	1 – Rare
Brown Trout	N	2 - Common
Channel Catfish	N	1 – Rare
Cutthroat Trout	N	1 – Rare
Flannelmouth Sucker	Y	1 – Rare
Mountain Sucker	Y	0 - Unknown
Mountain Whitefish	Y	1 – Rare
Rainbow Trout	N	2 - Common
Redside Shiner	N	3 - Abundant
White Sucker	N	3 - Abundant

Flannelmouth sucker, mountain sucker, and mountain whitefish are the only native fish in the reservoir, and all are considered rare. Native bluehead sucker occur in the river upstream of Big Sandy Reservoir, but have not been encountered in the reservoir for many years. Two particularly invasive species present in the reservoir include burbot and white sucker. Burbot were illegally introduced to the reservoir prior to 2001. They were also illegally introduced into Fontenelle Reservoir and became established in Flaming Gorge Reservoir, either as a result of drift from the two upstream reservoirs or via a third illegal introduction. Both burbot and white sucker have reduced the quality of the fishery at Big Sandy Reservoir, making it a less desirable fishing destination (WGFD 2017a).

Table 3-3 Fish Stocking in Big Sandy Reservoir 2013-2020

Year	Species	Number Stocked
2013	Brown Trout	45K
2014	Brown Trout	24K
2015	Brown Trout	20K
2015	Rainbow Trout	25K
2016	Brown Trout	11K
2016	Rainbow Trout	21K
2017	Brown Trout	25K
2017	Rainbow Trout	10K
2018	Brown Trout	7K
2018	Rainbow Trout	8K
2019	Brown Trout	20K
2019	Rainbow Trout	20K
2020	Brown Trout	7K
2020	Rainbow Trout	22K

Non-native white sucker have been a problem in this reservoir since their introduction sometime after 1957 but before 1968 (Miller 1978). By 1970, their numbers had increased to a level that warranted chemical treatment. Several attempts were made to control the population during the

1970s and early 1980s by applying rotenone in the river upstream of the reservoir to target spawning white sucker as they ascended the river. All attempts showed limited success, but the population always rebounded. Although there were plans to chemically treat the reservoir during the mid to late 1980s and early 1990s, a treatment never occurred. Presently white sucker are the most abundant fish species in Big Sandy Reservoir.

Burbot were illegally introduced in the late 1980s or early 1990s and have become problematic as well. The exact year they were introduced is unknown, but burbot established a reproducing population in the reservoir following their introduction. Once in the system, burbot spread both upstream and downstream, establishing populations in the river and ultimately invading the entire lower Green River drainage. In 2001 they were discovered in the rock sill area of the lower Big Sandy River and by 2005 they established a population in the river upstream of the reservoir (WGFD 2017a).

Big Sandy River upstream of the Reservoir
Based on drainage-wide surveys conducted from 2002-2006 (Gelwicks et al. 2009), fish species that occur in the Big Sandy River upstream of Big Sandy Reservoir include native bluehead sucker, flannelmouth sucker, mottled sculpin, mountain sucker, mountain whitefish, and speckled dace, as well as non-native brook trout, brown trout, common carp, fathead minnow, lake chub, longnose dace, longnose sucker, rainbow trout, redside shiner, Utah chub, and white sucker. Since those surveys, illegally introduced burbot have also taken up residence in the river (first detected in 2005).

The Big Sandy River upstream of Big Sandy Reservoir is considered a priority area for flannelmouth and bluehead sucker conservation in Wyoming (Senecal 2010). Both species are categorized by the WGFD as Species of Greatest Conservation Need, with rankings of NSS1, indicating a population status of imperiled and with extreme limiting factors (WGFD 2017b). A major threat to these species is hybridization with non-native white sucker and longnose sucker. In addition, these species face the increased predation pressure from illegally introduced burbot. In order to conserve native suckers in the Big Sandy River upstream of the reservoir, a rotenone treatment is planned in 2021 to eliminate these non-native fish from approximately 60 miles of river. Native suckers will be salvaged prior to the chemical treatment and will be re-stocked once the removal of non-native species is complete. A fish migration barrier located approximately seven miles upstream of Big Sandy Reservoir will allow separation between the reservoir and river fish assemblages.

3.3.1.3 *Aquatic Invertebrates*
Benthic organisms found in the reservoir consist primarily of Diptera larvae and zooplankton consisting mostly of Copepods, Cladocerans, and Rotifers. Sampling conducted in 1972 found that copepods were the most abundant zooplankton present, but *Daphnia spp.* (Cladocerans) made up the greatest volume (Miller 1973). Crayfish also became established in Big Sandy Reservoir by 1978 (Miller 1978) and currently two introduced species are known to occur there (*Orconectes immunis* and *O. virilis*; Hubert 2010). No sensitive, threatened, or endangered aquatic invertebrates are known to occur in Big Sandy Reservoir or in its vicinity.

3.3.2 Impacts to Fish and Wildlife

3.3.2.1 No Action
Under the No Action Alternative, the Project would not be implemented, and therefore there would be no negative effects on amphibians, fish, or aquatic invertebrates.

3.3.2.2 Proposed Action

Amphibians

Impacts of rotenone on amphibians has been studied both in the laboratory and in wild populations. In general, these studies show that rotenone concentrations commonly used to control fish can negatively affect tadpoles, but have no effect on metamorphs, juveniles and adults that lack gills (Grisak et al. 2007, Billman et al. 2011, Billman et al. 2012). In Montana, a landscape-scale piscicide treatment allowed researchers to measure the impacts of rotenone treatments in 10 alpine lakes on Columbia spotted frog (*Rana luteiventris*), western toad (*Anaxyrus (Bufo) boreas*), long-toed salamander (*Ambystoma macrodactylum*), and Rocky Mountain tailed frog (*Ascaphus montanus*) populations over multiple years (Fried et al., 2018). They observed no decrease in detection frequency of any of these species following one-time rotenone treatments and suggested fish biologists could mitigate the negative effects of rotenone treatments on amphibians by timing treatments to avoid gill-breathing life stages, using rotenone concentrations that were lethal to trout but sublethal to certain amphibian life stages, and/or ensuring that nearby populations exist in untreated areas that can recolonize treated areas.

Western tiger salamander, Great Basin spadefoot, northern leopard frog and boreal chorus frog in Wyoming all metamorphose from their larval, gilled forms in September at the latest (Baxter and Stone 1985). Given that the treatment of Big Sandy Reservoir will occur in late September, most tadpoles and larval salamanders will not be susceptible to the toxic effects of the rotenone (Baxter and Stone 1985). If some mortality does occur, sufficient populations of adults should be able to readily repopulate the area the following spring and summer.

Fish

As intended, treatment of Big Sandy Reservoir with rotenone will likely kill all fish present, regardless of species. While some dead fish may float to the surface, most will sink to the bottom of the reservoir where they will naturally decompose. Following a successful treatment, the threat of non-native White Sucker and Burbot to the fishery will be eliminated. In addition, their removal from the reservoir will substantially reduce the threat of illicit or accidental reintroduction of these species to the native fish restoration area upstream of the reservoir.

In the spring of 2022, surveys will be initiated to determine the effectiveness of the treatment (i.e., determine if any fish remain) and to document the recovery of the zooplankton and benthic macroinvertebrate communities. Once it is determined that all fish have been removed and food resources have recovered, stocking of brown and rainbow trout will commence. Preliminary plans are to stock 22,500 3-inch brown trout and 22,500 5-inch rainbow trout in 2022. These fish will recruit to catchable size by 2023. Consideration may also be given to planting larger trout in 2022 to provide catchable sized fish earlier, and other species, such as channel catfish, may be considered for stocking in the future. Monitoring will be conducted over several years to ascertain recovery of the sport fishery and any resurgence of non-native species. Based on monitoring results, stocking practices may be adjusted to meet the goal of maintaining a quality fishery. Therefore, the fishery would initially be negatively impacted in order to improve it thereafter. The negative impacts would not be significant.

Aquatic Invertebrates

The impacts of rotenone on aquatic invertebrates in lentic habitats has been studied since the 1940s, but results have been highly variable, mainly due to varying concentrations of rotenone and varying

intensity of pre- and post-treatment sampling (see review by Vinson et al. 2010). In general, phytoplankton tend to show greater negative impacts from rotenone treatments than benthic organisms. Zooplankton showed declines primarily in abundance, but also in diversity post-treatment. Recovery of zooplankton to pre-treatment abundances took from 1 month to 3 years and Rotifera and Copepoda assemblages returned to pre-treatment abundances more quickly than Cladocera assemblages. Small differences were reported in pre- and post-treatment total benthic macroinvertebrate abundance and biomass, with the greatest impact to Chironomidae, the most abundant taxa. Recovery of benthic macroinvertebrates generally occurred in six months to one year.

Kiser et al. (1963) found that after a rotenone treatment of Fern Lake, WA, all 42 cladoceran and copepod species returned. They attribute the recovery to the fact that cladoceran eggs are unaffected by rotenone, some zooplankton likely survive in areas less accessible to rotenone (i.e., weedy areas), and some species enter the lake from outside. In addition, the authors found that spring and early summer application of rotenone had more severe and lingering effects on zooplankton than fall application. In a study of the impacts of rotenone application to "barrow pits" in Nebraska, (Peterson et al., 2011) also concluded that late summer application of rotenone had a limited impact on zooplankton communities. Given these results, the planned late-September treatment of Big Sandy Reservoir should help to mitigate some of the impacts to the zooplankton community in the reservoir.

Based on the foregoing information, the proposed treatment would not cause significant, long-term, adverse impacts on the aquatic invertebrate community in Big Sandy Reservoir. Rather, the expected benefits of eliminating problematic fish species outweigh the minimal long-term risks to aquatic invertebrates.

3.4 Cultural Resources

Under 36 CFR Part 800 cultural resources are defined as physical or other expressions of human activity or occupation that are over 50 years in age. Such resources include culturally significant landscapes, prehistoric and historic archaeological sites as well as isolated artifacts or features, traditional cultural properties, Native American and other sacred places, and artifacts and documents of cultural and historic significance.

Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), mandates that Reclamation take into account the potential effects of a proposed Federal undertaking on historic properties. Section 106 defines historic properties as any prehistoric or historic district, site, building, structure, or object included in, or eligible for, inclusion in the National Register of Historic Places (NRHP). Potential effects of the described alternatives on historic properties are the primary focus of this analysis.

In compliance with the regulations specified in Section 106 of the NHPA (36 CFR 800.16), the affected environment for cultural resources is identified as the APE. The APE is defined as the geographic area within which federal actions may directly or indirectly cause alterations in the character or use of historic properties. The APE for the Proposed Action includes the area that could be physically affected by any of the proposed alternatives (the maximum limit of disturbance). The indirect APE includes areas where changes in the visual setting of historic properties could be

caused by the Project. This is often assessed through a view shed analysis. A view shed analysis examines whether the project makes a significant change to a historic property's setting due to changes in the surrounding visible from the historic property.

In general, cultural resources around the Big Sandy Reservoir consist of prehistoric and historic sites situated along the Big Sandy River. Some previously identified prehistoric sites were located immediately adjacent to the river and were flooded when the reservoir was initially filled. Other prehistoric sites were located on the upper terraces of the river basin and have been marginally impacted by the reservoir, primarily because of erosion related to wave action as the sandy soil erodes into the reservoir bringing the archaeological site with it. Prehistoric peoples were attracted to the basin because of the presence of water, fish, and game; but also because of natural outcrops of cobbles exposed along the southern side of the extent reservoir. These river-worn cobbles consist of medium to high-grade tool material that was used for making arrowheads, scrapers, and other tools.

Historic use of the area includes emigrants moving through the area, sheep and cattle grazing, and farming. Emigrants moving through Wyoming to Oregon (or other locales) could cross the Big Sandy River four miles south of the reservoir via the Oregon-California-Mormon Pioneer-Pony Express trails or they could take the Sublette Cutoff immediately south of the reservoir. Settlers of Eden and Farson, Wyoming, grazed herds and/or farmed the sagebrush steppe and acquired goods via wagon roads, such as the New Fork Wagon Road, that connected the small communities. Because of the lack of rainfall in the area, large irrigation networks were created to move water to farms. The Eden Canal diverts off the Big Sandy River north of the APE and brings water to the Eden-Farson irrigation network, but it does not have water reserves for drought years.

Consequently, Reclamation was authorized by Congress to "reclaim" the land for agricultural purposes under the Colorado River Storage Project Act of April 11, 1956 (70 Stat. 105), as amended. Accordingly, the Eden Project (servicing the towns of Eden and Farson, Wyoming) was built by Reclamation which includes the Big Sandy Dam and Dike, the Eden Reservoir, a network of canals, drains, and other facilities. Work began on the project in 1941 with labor from the Civilian Conservation Corps (CCC) but was halted during World War II. After the war, the project was completed, and the responsibility to operate and maintain the project was transferred to the Eden Valley Irrigation and Drainage District.

3.4.1 Impacts on Cultural Resources

3.4.1.1 No Action

Under the No Action Alternative, the rotenone treatment would not occur, and therefore there would be no effects to cultural resources due to this action. Existing conditions would continue.

3.4.1.2 Proposed Action

The proposed action would have no effect on cultural resources. The rotenone treatment would not harm or affect historic properties. In addition, there are no ground disturbing activities associated with this action. However, the rotenone treatment of the reservoir would occur in conjunction with a different project – that of augmenting the reservoir through modification of the dam. This other project would adversely affect historic properties. Reclamation and the Wyoming State Historic Preservation Officer have entered into a memorandum of agreement about the effects and resolution of effects to historic properties due to the reservoir's proposed increase in size.

3.5 Indian Trust Assets

Indian Trust Assets (ITAs) are legal interests in property held in trust by the United States for Indian tribes or individuals. The Department of the Interior's policy is to recognize and fulfill its legal obligations to identify, protect, and conserve the trust resources of federally recognized Indian tribes and tribal members, and to consult with tribes on a government-to-government basis whenever plans or actions affect tribal trust resources, trust assets, or tribal safety (see Departmental manual, 512 DM 2). Under this policy, as well as Reclamation's ITA policy, Reclamation is committed to carrying out its activities in a manner which avoids adverse impacts to ITAs when possible, and to mitigate or compensate for such impacts when it cannot. All impacts to ITAs, even those considered to not be significant, must be discussed in the trust analyses in NEPA compliance documents and appropriate compensation or mitigation must be implemented.

Trust assets may include lands, minerals, hunting and fishing rights, traditional gathering grounds, and water rights. Impacts to ITAs are evaluated by assessing how the action affects the use and quality of ITAs. Any action that adversely affects the use, value, quality or enjoyment of an ITA is considered to have an adverse impact to the resources.

Dr. Zachary Nelson conducted a review of the Current American Indian/Alaska Native/Native Hawaiian Areas (AIANNH) National Shapefile which indicated that no Indian Trust Assets (ITAs) were located near the Project area. This review occurred on March 5, 2021.

There are no known ITAs in the Project area vicinity and the tribes that were consulted did not indicate the presence of any ITAs. Therefore, there could not be any effect on ITAs from the No Action or Proposed Action alternatives.

3.6 Environmental Justice

Executive Order 12898 established Environmental Justice as a Federal agency priority to ensure that minority and low-income groups or Indian tribes are not disproportionately affected by Federal actions. Executive Order 14008 reemphasized the Federal government's commitment to environmental justice. The Environmental Protection Agency (EPA) generally suggests that a minority, low-income, or American Indian group (collectively, "EJ populations") is present in the Project area if one or more of the groups represents at least 50 percent of the larger population or if the group is more than 10 percentage points higher than the reference population.

Big Sandy Reservoir is located in Sweetwater and Sublette Counties. The estimated population in both counties together totaled 54,889 in 2015 (U.S. Department of Commerce 2016). Those identifying as white accounted for 92.8 percent of the populations. Those who identified as two or more races accounted for the next highest percentage (3.4 percent), followed by those identifying as some other race not listed Table 3-5.

Table 3-4 Population by Race in Sublette and Sweetwater Counties, Wyoming

Population by Race, 2015*

	Sweetwater County, WY	Sublette County, WY	County Region	U.S.
Total Population	44,772	10,117	54,889	316,515,021
White alone	41,250	9,681	50,931	232,943,055
Black or African American alone	¨388	¨0	¨388	39,908,095
American Indian alone	¨269	¨3	¨272	2,569,170
Asian alone	¨384	¨53	¨437	16,235,305
Native Hawaiian & Other Pacific Is. alone	¨229	¨2	¨231	546,255
Some other race alone	¨754	¨12	¨766	14,865,258
Two or more races	1,498	¨366	1,864	9,447,883
Percent of Total				
White alone	92.1%	95.7%	92.8%	73.6%
Black or African American alone	¨0.9%	¨0.0%	¨0.7%	12.6%
American Indian alone	¨0.6%	¨0.0%	¨0.5%	0.8%
Asian alone	¨0.9%	¨0.5%	¨0.8%	5.1%
Native Hawaiian & Other Pacific Is. alone	¨0.5%	0.0%	¨0.4%	0.2%
Some other race alone	¨1.7%	¨0.1%	¨1.4%	4.7%
Two or more races	3.3%	¨3.6%	3.4%	3.0%

* The data in this table are calculated by ACS using annual surveys conducted during 2011-2015 and are representative of average characteristics during this period.

In 2015, approximately 11.5 percent of individuals and 8.6 percent of families were living below the Federal poverty level, both of which were lower than the U.S. averages of 15.5 percent (individuals) and 11.3 percent (families). Of those individuals below the poverty level in Sweetwater County, 12.1 percent self-identified as a minority race compared to 39.4 percent for the U.S. (U.S. Department of Commerce 2016) (Table 3-6).

Table 3-5 Poverty by Race and Ethnicity in Sublette and Sweetwater Counties, Wyoming

Poverty by Race and Ethnicity^, 2015*

	Sweetwater County, WY	Sublette County, WY	County Region	U.S.
Total Population (all races) in Poverty	5,058	¨812	5,870	47,749,043
White alone	4,445	¨812	5,257	28,923,918
Black or African American alone	¨108	¨0	¨108	10,321,254
American Indian alone	¨185	¨0	¨185	702,127
Asian alone	¨33	¨0	¨33	2,000,884
Native Hawaiian & Oth.Pacific Is. alone	¨0	¨0	¨0	111,137
Some other race	¨64	¨0	¨64	3,865,363
Two or more races	¨223	¨0	¨223	1,824,360
All Ethnicities in Poverty				
Hispanic or Latino (of any race)	¨1,678	¨33	¨1,711	12,915,617
Not Hispanic or Latino (of any race)	3,107	¨779	3,886	20,750,471
Percent of Total**				
White alone	87.9%	¨100.0%	89.6%	60.6%
Black or African American alone	¨2.1%	¨0.0%	¨1.8%	21.6%
American Indian alone	¨3.7%	¨0.0%	¨3.2%	1.5%
Asian alone	¨0.7%	¨0.0%	¨0.6%	4.2%
Native Hawaiian & Oth.Pacific Is. alone	¨0.0%	¨0.0%	¨0.0%	0.2%
Some other race	¨1.3%	¨0.0%	¨1.1%	8.1%
Two or more races	¨4.4%	¨0.0%	¨3.8%	3.8%
Hispanic or Latino (of any race)	¨33.2%	¨4.1%	¨29.1%	27.0%
Not Hispanic or Latino (of any race)	61.4%	¨95.9%	66.2%	43.5%

^ Percent of total population in poverty by race and ethnicity is calculated by dividing the number of people in poverty in each racial or ethnic category by the total population.
* The data in this table are calculated by ACS using annual surveys conducted during 2011-2015 and are representative of average characteristics during this period.
** Total equals all individuals in poverty.

As described in section 3.5, there are no ITAs in the Project vicinity nor Indian reservations. Based on Table 3-6, approximately 0.5 percent of the county region was comprised of individuals

identifying as American Indian alone. Based on the foregoing information, there are no EJ populations present and therefore, the Project would not have an adverse effect on EJ populations.

4 Environmental Commitments

Environmental Commitments have been developed to further lessen the potentially minimal effects of the Proposed Action. The following environmental commitments will be implemented as an integral part of the Proposed Action.

1. **Additional Analyses** - If the Proposed Action were to change significantly from that described in this EA because of additional or new information, or if other spoil, or work areas beyond those outlined in this analysis are required outside the defined Project area, additional environmental analyses will be completed as may be necessary.

2. **WYPDES Permit** – A Wyoming Pollution Discharge Elimination System (WYPDES) Pesticide General Permit (Authorization WYG480036) is required. This permit authorizes the point source discharge of piscicides to approved waters by certified applicators of the Wyoming Game and Fish Department. This permit from the Wyoming Department of Environmental Quality will include a notice of intent for discharge to Big Sandy Reservoir in 2021 and complies with Section 402 of the Clean Water Act for actions involving the discharge of pollutants into waters of the state of Wyoming.

3. **Cultural Resources** - If any cultural resources, either on the surface or subsurface, are discovered during Project activities, Reclamation's Provo Area Office archaeologist shall be notified and all activity in the area of the inadvertent discovery will cease until an assessment of the resource and recommendations for further work can be made by a professional archaeologist.
    a. If any person who knows or has reason to know that he/she has inadvertently discovered possible human remains on Federal land, he/she must provide immediate telephone notification of the discovery to the police and Reclamation's Provo Area Office archaeologist. Work will stop until the proper authorities are able to assess the situation onsite. This action will promptly be followed by written confirmation to the responsible Federal agency official. The Wyoming SHPO and interested Native American Tribal representatives will also be promptly notified. Consultation with SHPO and Native American Tribal representatives will begin immediately. This requirement is prescribed under the Native American Graves Protection and Repatriation Act (43 CFR Part 10); and the Archaeological Resources Protection Act of 1979 (16 U.S.C. § 470).

4. **Paleontological Resources** - Should vertebrate fossils be encountered during ground disturbing actions, Project activity must be suspended until a qualified paleontologist can be contacted to assess the find.

5 Scoping, Coordination, and Public Involvement

Scoping is an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action. Scoping includes all types of information-gathering activities and can occur throughout the NEPA process. The Proposed Action was presented to the public and agencies as outlined below.

5.1 Comment Period

A 30-day comment period, which ends on April 30, 2021, is being conducted on this Draft EA. Comments must be submitted via hard copy, either email or standard mail, to Reclamation at one of the addresses below.

Email (preferred): jbaxter@usbr.gov
Standard mail: U.S. Bureau of Reclamation
Re: Big Sandy Rotenone Draft EA
302 East Lakeview Parkway
Provo, Utah 84606

Questions or requests for hard copies of this Draft EA can be directed to Mr. Jared Baxter at jbaxter@usbr.gov or (801) 379-1081.

5.2 Wyoming State Historic Preservation Office

The proposed action falls under the exemptions of the Statewide Programmatic Agreement regarding the Management of Irrigation Facilities in the State of Wyoming of 2021, Appendix A, Section C.11. "Rotenone treatment of reservoir or river segment". As an exemption under this agreement, Reclamation will include the proposed action in an annual report to Wyoming SHPO. No further consultation is needed.

5.3 Native American Consultation

Reclamation conducted Native American consultation throughout the public involvement process. A letter detailing the project was sent to Tribes with known interests in the Project vicinity on March 31, 2021. This included the Apache Tribe of Oklahoma; Arapaho Tribe of the Wind River Reservation, Wyoming; Cheyenne and Arapaho Tribes, Oklahoma; Comanche Nation, Oklahoma; Crow Tribe of Montana; Fort Belknap Indian Community of the Fort Belknap Reservation of Montana; Shoshone Tribe of the Wind River Reservation; and the Shoshone-Bannock Tribes of the Fort Hall Reservation of Idaho. Consultation complied with 36 CFR 800.2(c)(2) on a government-to-government basis. Through this effort each tribe is given a reasonable opportunity to identify any concerns about historic properties; to advise on the identification and evaluation of historic

properties, including those of traditional religious and cultural importance; to express their views on the effects of the Proposed Action on such properties; and to participate in the resolution of adverse effects.

6 Preparers

The following is a list of preparers who participated in the development of the EA. They include environmental summary preparers, Reclamation team members, and Federal, State and District members.

Wyoming Game and Fish Department Preparers

Name	Title	Contribution
Kevin Gelwicks	Assistant Fisheries Management Coordinator	Introduction, Alternatives, Affected Environments and Environmental Consequences to include: Water Quality, Fish and Wildlife Resources.
John Walwrath	Fisheries Biologist	Affected Environments and Environmental Consequences to include: Water Quality, Fish and Wildlife Resources.
Robert Keith	Fisheries Supervisor	Document Review

Reclamation Team, Environmental Preparers

Name	Title	Contribution
Jared Baxter	NEPA Specialist	Document Preparation and Oversight
Zachary Nelson	Archaeologist	Cultural, Indian Trust Assets

7 Acronyms and Abbreviations

Acronyms	Meaning/Description
APE	Area of Potential Effect

AIANNH	American Indian/Alaska Native/Native Hawaiian
BMP	Best Management Practice
CFR	Code of Federal Regulations
cfs	Cubic Feet Per Second
EA	Environmental Assessment
EO	Executive Order
FONSI	Finding of No Significant Impact
ITA	Indian Trust Asset
LIDAR	Light Detection and Ranging
MSL	Mean Sea Level
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
NSS4	Vulnerable with moderate limiting factors
NSS5	Stable with moderate limiting factors
PA	Programmatic Agreement
ppm	Parts per million
Reclamation	U.S. Bureau of Reclamation
SHPO	State Historic Preservation Office
SOP	Standard Operating Procedure
WGFD	Wyoming Game and Fish Department
WPDES	Wyoming Pollution Discharge Elimination System Permit

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