

**2025 PRE-TREATMENT PLAN FOR UPPER WEST  
BRANCH LECLERC CREEK, PEND OREILLE COUNTY,  
WASHINGTON**

**Bill Baker and Brian Walker**  
Washington Department of Fish and Wildlife  
Fish Management Division  
District 1  
755 S. Main St.  
Colville, WA 99114



## Table of Contents

List of Figures .....	2
List of Tables .....	2
1.0 INTRODUCTION.....	3
2.0 WATER DESCRIPTION.....	7
3.0 TOXICANT(S) AND DEACTIVATION .....	8
4.0 PURPOSE .....	8
5.0 DESCRIPTION OF FISH SPECIES TO BE ERADICATED AND HOW DMP ACTION THRESHOLDS ARE MET.....	9
6.0 INTENDED OUTCOME/MEASURE OF SUCCESS .....	10
7.0 RESOURCE IMPACTS.....	10
8.0 MITIGATING FOR ADVERSE IMPACTS .....	11
9.0 RECREATIONAL IMPACT .....	12
10.0 ECONOMIC IMPACTS .....	12
11.0 RELATED MANAGEMENT ACTION.....	12
12.0 PUBLIC CONTACT .....	12
13.0 PRE-TREATMENT ANALYTICAL METHODS USED FOR MONITORING .....	13
14.0 POST-TREATMENT ANALYTICAL METHODS USED FOR MONITORING .....	13
15.0 REFERENCES:.....	15

## List of Figures

<b>Figure 1.</b> West Branch LeClerc Creek Project Area within the LeClerc Creek Watershed in Washington State (red shading). The yellow star indicates the location of the temporary fish management structure (tFMS). .....	4
<b>Figure 2.</b> West Branch LeClerc Creek temporary fish management structure. ....	5
<b>Figure 3.</b> Upper West Branch LeClerc Creek Project Area. Stream reaches shown in red indicate non-native fish distribution and would be treated with rotenone.....	6
<b>Figure 4.</b> Brown Trout captured via electrofishing in the Project Area during pilot salvage in 2024.....	9

## List of Tables

<b>Table 1.</b> Distance (m) to be treated by stream in the UWBL Project Area.....	6
--	---

## 1.0 INTRODUCTION

Westslope Cutthroat Trout (WCT) *Oncorhynchus clarki lewisi* are native to the Pend Oreille River watershed in Washington, but have declined in abundance and range. The presence of non-native fish species, particularly Brook Trout *Salvelinus fontinalis*, is a serious threat to persistence and/or recovery of native salmonids in the Pend Oreille Basin through interbreeding or competition for habitat and food resources (Andonaegui 2003). On July 11, 2005, the Federal Energy Regulatory Commission (FERC or Commission) issued a new license for operation of Box Canyon Dam (Order; US-FERC 2005), part of the Box Canyon Hydroelectric Project (FERC license no. 2042-013). Box Canyon Dam is located on the Pend Oreille River in Northeast Washington State, approximately 90 miles north of the City of Spokane, and is operated by the Public Utility District No. 1 of Pend Oreille County (PUD). Some of the provisions in the Order were subsequently modified in a Settlement Agreement (SA) and included in an order amending the Project license on February 19, 2010 (130 FERC 61,148; US-FERC 2008). Amongst other amendments was a requirement for the Trout Habitat Restoration Plan (THRP) in the tributaries to Box Canyon Reservoir (Appendix A of the License Amendment Order, Revised 4(e) Condition 6).

Per the THRP, the PUD is required to restore 164 miles of tributary habitat. Conditions for habitat restoration are provided in Section 1.1 as follows:

*The Licensee shall restore 164 miles of tributary habitat pursuant to the terms identified in this section. These restoration efforts shall be completed within 25 years of this agreement and shall be prioritized in the Calispell, Cee Cee Ah, Cedar, LeClerc, Indian, Mill, Ruby, and Tacoma creek watersheds. If 164 miles of appropriate tributary habitat cannot be restored in these watersheds, restoration efforts may occur in other watersheds in the Project area with priority given to suitable streams within Pend Oreille County. The Secretary retains authority to continue requiring additional Restoration Projects by the Licensee, if at the end of the 25-year implementation period 164 miles of restoration has not been achieved, until the Licensee achieves 164 miles of restoration.*

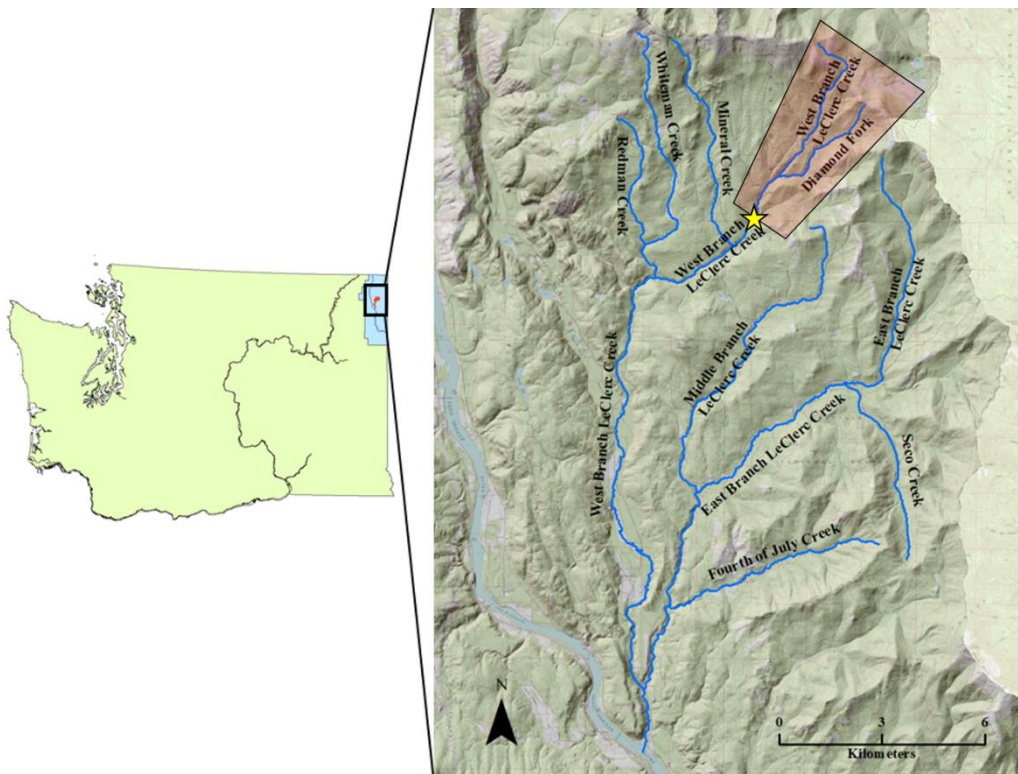
In Section 1.3.1, the THRP goes on to say:

*“Restoration” of each stream segment will include a combination (some or all) of the following measures as determined necessary by the Technical Committee:*

- *Channel improvements (limited to geomorphologic improvements and barrier removal)*
- *Floodplain restoration*
- *Riparian corridor restoration*
- *Fencing*

- *Conservation easements and/or purchases*
- *Non-native fish removal (see section 1.3.2)*
- *Reintroduction of target fish species (see section 1.3.3)*

In meetings of the Box Canyon Technical Committee (TC) and Fish Subcommittee (FSC) during 2019, an agreement was reached that restoration work in the LeClerc Creek Watershed (Figure 1) would be the top near-term priority. The TC and FSC approved Phase 1 of the Upper West Branch LeClerc Creek Native Fish Restoration project in 2020, with field work beginning during summer 2020 and completed by summer 2022 (WDFW & KNRD 2020, Walker et al. 2022).



**Figure 1.** West Branch LeClerc Creek Project Area within the LeClerc Creek Watershed in Washington State (red shading). The yellow star indicates the location of the temporary fish management structure (tFMS).

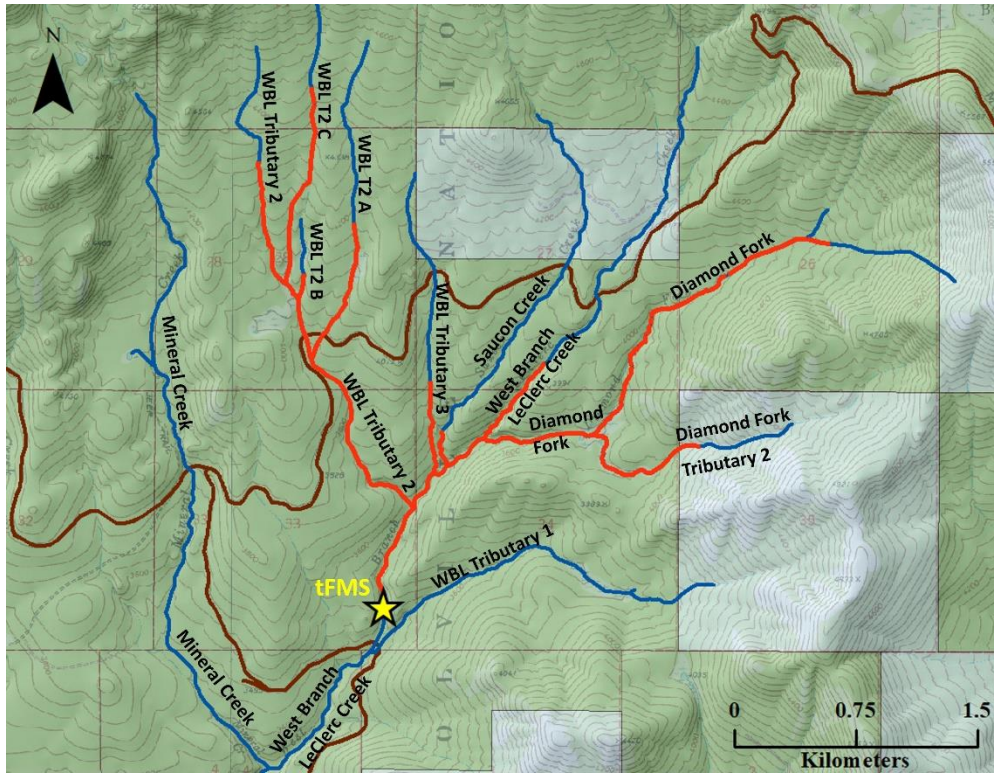
Phase 1 of the Upper West Branch LeClerc Creek Native Fish Restoration project consisted of data collection to inform proposed piscicide (rotenone) treatments (Phase 2) of the Upper West Branch LeClerc Creek (UWBL) Watershed. The treatments would remove non-native fish (e.g., Brook Trout and Brown Trout *Salmo trutta*) in preparation for native fish restoration (e.g., WCT; Phase 3). Data collected in Phase 1 (described in Walker et al. 2022) were incorporated into a piscicide treatment implementation plan (Walker et al. 2024) in support of the non-native fish eradication proposal.

Given the size and complexity of the UWBL Watershed, a single piscicide treatment above the confluence with East Branch LeClerc Creek would not be feasible. Rather, the watershed would be divided via the use of temporary fish management structures (tFMS), allowing non-native fish eradication to proceed in stages (e.g., Flume Creek; Baker and Walker 2019). Phase 1 resulted in the selection of a site immediately upstream of United States Forest Service (USFS) Road #1935, based on a combination of slope, valley confinement, and access (Bruce Heiner, Environmental Engineer, pers. comm; Walker et al. 2022). Additional tFMS site surveys to inform design and construction were conducted in spring/summer 2022 by the PUD, and 100% design was completed in November 2022 (Scott Jungblom, Natural Resource Manager, PUD; email to FSC November 22, 2022). The project went to bid in April 2023 and was completed in September 2023 (Figure 2).



**Figure 2.** West Branch LeClerc Creek temporary fish management structure.

The UWBL Project Area (Figure 3) consists of all non-native fish-bearing reaches above the tFMS and is located within the LeClerc Creek Watershed, in Township 36N, Range 44E, Sections 3 and 4, and Township 37N, Range 44E, Sections 14-17, 20-23, 25-29, and 32-35.



**Figure 3.** Upper West Branch LeClerc Creek Project Area. Stream reaches shown in red indicate non-native fish distribution and would be treated with rotenone.

The area to be treated encompasses approximately 13.4 km (8.32 miles) of UWBL and tributaries (Table 1).

**Table 1.** Distance (m) to be treated by stream in the UWBL Project Area.

<b>Stream</b>	<b>Distance (m)</b>
West Branch LeClerc Creek	2,257
UWBL T2 Mainstem	2,827
UWBL T2 Fork A	943
UWBL T2 Fork B	278
UWBL T2 Fork C	1,027
UWBL T3	870
Saucon Creek	410
Diamond Fork	3,254
DF T2	959
DF T5	165
DF T6	237
DF T6A	35
DF T7	47
DF T8	75
<b>Total Distance (m)</b>	<b>13,384</b>
<b>Miles</b>	<b>8.32</b>

Native WCT co-occur with non-native fish within the Project Area, and would be salvaged prior to piscicide application. A pilot salvage effort was conducted in September 2024 to gain an understanding of the necessary level of effort to accomplish a full-scale salvage effort prior to treatment in 2025. Approximately 300 WCT from mainstem UWBL were captured during the pilot effort and transported to the Seattle City Light (SCL) Native Salmonid Conservation Facility (NSCF), located near Usk, WA. Along with those salvaged in 2025, these fish will be held on site until non-native fish removal in the Project Area has been completed. The full salvage effort will occur within the days or weeks leading up to the proposed treatment in summer 2025. Genetic analysis indicates that WCT from the UWBL mainstem and Tributary 1 exhibit greater genetic diversity, allelic richness, and heterozygosity than those residing within other portions of the Project Area, so salvage from those locations will be prioritized. Salvaged fish from portions of the Project Area with lower genetic diversity will be transported outside the treatment area and released (e.g., upstream of the Project Area). Captive broodstock at the NSCF would be spawned annually to produce multiple year-classes of offspring for reintroduction to the Project Area following non-native fish eradication.

Annual piscicide treatments would proceed above the tFMS until eradication of non-native fish is achieved (3 once-annual treatments are anticipated; additional treatments could be conducted as needed). Following non-native fish extirpation, WCT would be reintroduced to the treated area. Concurrent with upstream WCT reintroduction, construction of a second tFMS and non-native fish eradication would commence below the existing tFMS.

## **2.0 WATER DESCRIPTION**

- 1. WATER:** Upper West Branch LeClerc Creek and tributaries
- 2. COUNTY:** Pend Oreille
- 3. LOCATION:** T36N, R44E, S03 and S04; and T37N, R44E, S14-17, 20-23, 25-29, and 32-35. The terminus (most-downstream point) of the Project Area is located at 48.65212N, -117.24376W.
- 4. STREAM DESCRIPTION:** The Project Area includes the Brook Trout-bearing portions of West Branch LeClerc Creek and its tributaries upstream of the tFMS (48.65777N, -117.23834W). Total stream length to be treated is 8.32 miles. Stream widths vary from 18 inches (tributaries) to 24 feet (West Branch LeClerc Creek). Discharge ranges from 0.1 cfs (tributaries) to 5 cfs (West Branch LeClerc Creek) at base flow.
- 5. WATER WITHDRAWALS:** No known water withdrawals or water rights within the Project Area.
- 6. OUTLET:** Tributary to LeClerc Creek, which flows into Box Canyon Reservoir (Pend Oreille River)
- 7. STREAM:** Yes. This is a tributary stream rehabilitation.

- 8. PUBLIC ACCESS:** Yes
- 9. LAND OWNERSHIP:** Public 98% (USFS), 2% Private (Stimson)
- 10. ESTABLISHED RESORTS:** None
- 11. TARGET SPECIES:** Brook Trout and Brown Trout
- 12. DATE LAST REHABILITATED:** Never
- 13. PROPOSED TREATMENT DATE RANGE:** 08/01/2025 – 09/30/2025
- 14. RESTOCKING DATE:** Summer 2028
- 15. SPECIES:** Westslope Cutthroat Trout
- 16. ADULTS/CATCHABLES/FRY/FINGERLINGS:** N/A

Approximately 3,000-5,000 WCT, produced from WCT salvaged from the UWBL Project Area prior to treatment and held at the SCL NSCF, will be introduced to the Project Area following non-native fish removal.

### **3.0 TOXICANT(S) AND DEACTIVATION**

- 1. TOXICANT(S):** Rotenone Powder Fish Toxicant (powder formulation; EPA Reg. #89459-32), CFT Legumine Fish Toxicant (liquid formulation; EPA Reg. #655-899), and Prenfish Fish Toxicant (liquid formulation; EPA Reg. #89459-85).
- 2. TOXICANT CONCENTRATION (ppm):** up to 4.0
- 3. TOXICANT AMOUNT (gal of liquid and lbs of powder rotenone product @ 5% active ingredient; ai):** up to 15 gal liquid and 15 lbs powder.
- 4. METHOD OF TOXICANT APPLICATION:** Drip can, backpack sprayer, and rotenone/gelatin/sand mixture.
- 5. DEACTIVATION (OXIDIZER):** Potassium permanganate (KMnO<sub>4</sub>; free flowing formulation; EPA Reg. #'s 7722-64-7 and 1344-00-7).
- 6. OXIDIZER CONCENTRATION (ppm):** up to 5.0
- 7. OXIDIZER AMOUNT (lbs of powder):** up to 750 lbs
- 8. METHOD OF OXIDIZER APPLICATION:** Free-flowing powdered potassium permanganate is mixed in 400-gal tanks and applied to the stream as a 1% solution via 0.83 hp chemical-resistant pump (March Pump, Glenview, IL) powered by a Honda EU2000 generator. Flow is calibrated hourly to ensure sufficient potassium permanganate is added to the stream to neutralize rotenone and satisfy biological oxygen demand with a small residual remaining (0.0 – 1.0 ppm).

### **4.0 PURPOSE**

Historically widespread and abundant throughout the Pend Oreille River Basin, WCT have experienced significant constriction of range and abundance within the last 100 years. Removal of non-native Brook Trout and Brown Trout followed by restoration of WCT in UWBL is consistent with the WDFW goal to “conserve and protect native fish and wildlife”. This work would aid in restoring ecosystem function, provide source stocks of genetically pure WCT for



the future, and act as a buffer against future petitioning of WCT under the Endangered Species Act (ESA).

## **5.0 DESCRIPTION OF FISH SPECIES TO BE ERADICATED AND HOW DMP ACTION THRESHOLDS ARE MET**

The fish species targeted for eradication are Brook Trout and Brown Trout. Significant declines in WCT abundance have been documented throughout the western United States over the past 100 years, due in large part to competition with, and displacement by, non-native fish (e.g., Brook Trout; Shepherd et al. 2003). Brook Trout were extensively stocked throughout the LeClerc Creek watershed over the past 100 years (first recorded stocking in 1916; Darwin 1917) and are abundant in the project area (Maroney and Andersen 2000, Walker et al. 2022). Brown Trout were stocked throughout Pend Oreille County beginning in the 1930's, and are regularly observed by fisheries professionals in the lower West Branch LeClerc Creek drainage (Scholz 2014). They were not known in the Project Area prior to the removal of two downstream log-crib dams (completed by the USFS in 2018; Vadala 2023), but several individuals were captured during the pilot WCT salvage in 2024 (Figure 3).



**Figure 4.** Brown Trout captured via electrofishing in the Project Area during pilot salvage in 2024.

The Discharge Management Plan for the State of Washington Department of Ecology (DOE) Aquatic & Invasive Species Control General National Pollutant Discharge Elimination System (NPDES) Permit No. WAG994669 (2023) stipulates (Section B, subsection 2, item b and in Section C, subsection 1, item b) that the presence of non-native fish in a waterbody with suitable habitat for native species is a threshold that justifies rehabilitation (Behen 2023). Per above, both Brook Trout and Brown Trout are present in the Project Area, a priority watershed for

native WCT restoration (Maroney and Andersen 2000, Walker et al. 2022, Walker et al. 2024).

## **6.0 INTENDED OUTCOME/MEASURE OF SUCCESS**

This project has two objectives:

1. Eradicate non-native Brook Trout and Brown Trout from the Project Area.
2. Re-establish WCT throughout the Project Area.

Objective 1 will be achieved when non-native fish are functionally extirpated from the Project Area. Follow-up environmental DNA (eDNA) sampling and electrofishing will be utilized to confirm removal of Brook Trout and Brown Trout. Reproducing populations of WCT, expanding both in population size and spatial distribution, will indicate completion of Objective 2. Achievement of Objective 2 may take multiple years.

## **7.0 RESOURCE IMPACTS**

1. The target species, Brook Trout and Brown Trout, will be eradicated.
2. Regional Lands, Habitat, Wildlife and Non-Game managers have been apprised of the proposed UWBL rehabilitation. No unmitigated concerns have been expressed regarding the potential impacts to non-targeted species.
3. Rotenone is highly toxic to gill-breathing organisms because it is absorbed directly into the bloodstream through the gill epithelium. According to Bradbury (1986), the effects of rotenone on benthos are variable, depending on rotenone concentration and species. Crustaceans are most tolerant while smaller insects are most affected. Immediate reduction of populations averages 25%, and survival doubles when access to bottom sediments exists. Benthic communities generally recover to at least pre-treatment levels within two months. Zooplankton are more severely impacted, and communities generally take twelve to twenty-four months to fully recover (McGann and Strecker 2018). Risk to amphibians is dependent on life stage. Obligate gill-breathing stages (tadpoles) experience mortality rates similar to fish, while lung-breathing adults are not negatively affected. Mortality of transitional stages is directly related to the proportion of oxygen obtained via gills (Grisak et al. 2007, Billman et al. 2012). Amphibians native to Washington metamorphose to adulthood by late summer, so the timing of lake rehabilitations (fall) results in minimal impact to those species. Rotenone concentrations applied in piscicide treatments are essentially non-toxic to lung-breathing organisms (birds, mammals, reptiles, and adult amphibians) because the primary route of exposure is through ingestion, and natural enzymes in the digestive tract are effective at neutralizing rotenone (Ling 2003). In addition, rotenone does not concentrate in fish tissue and is quickly broken down in the environment (Ling 2003).

4. Application of rotenone under this proposal has been determined “not likely” to jeopardize threatened and endangered species or adversely affect their habitat by the United States Fish and Wildlife Service (Behan 2018, Cegelski 2022, USFWS 2023) because:

- Treatment will occur in locations where no aquatic endangered species are likely present (e.g., Bull Trout *Salvelinus confluentus* ).
- Terrestrial species (e.g., Canada Lynx *Lynx canadensis*, Grizzly Bear *Ursus arctos*, Yellow-billed Cuckoo *Coccyzus americanus*, etc.) are unlikely to be present OR will vacate the area to avoid contact with humans or short term, localized human-caused disturbances.
- Although critical habitat is present within the Project Area, application of rotenone will not damage habitat conditions. Rather, removal of non-native competing species will result in habitat improvement, which will benefit any Bull Trout that colonize UWBL in the future.
- Any negative impacts to aquatic habitats are temporary.
- Treatment will not impact terrestrial habitats.
- Disturbance associated with treatment activities is temporary and short in duration.
- Rotenone will be contained within the project area.
- Routes of entry for lung-breathing aquatic or terrestrial organisms are limited; thus, direct mortality from ingesting water or fish containing rotenone is very unlikely.
- Reductions of prey (fish or aquatic invertebrates) due to treatment are temporary.

## 8.0 MITIGATING FOR ADVERSE IMPACTS

1. Drinking water will not be affected by the 2025 UWBL rotenone treatment due to the distance between the terminus of the Project Area and any potable rights (Knudsen 2020). Removal of dead fish from the stream-course is also planned, with fish buried below the duff layer away from wetted areas.

2. Late summer/fall rehabilitation will not interfere with spring nesting of waterfowl or spawning of adult/rearing of juvenile amphibians.

3. Livestock use of the waters to be treated will not be significantly affected. The concentration of rotenone used in the treatment will be far below that considered harmful to mammals or birds, and there are no livestock watering restrictions for the rotenone products proposed for use (Section 3.0 (TOXICANT(S) AND DEACTIVATION)). Landowners and the USFS grazing allotment permittee will also be notified of the

rehabilitation and potential exposure of livestock to rotenone.

4. Appropriate respirators and other personal protective equipment (PPE) will be utilized by staff involved with mixing and applying liquid and powder rotenone per the product label and American Fisheries Society Rotenone Standard Operating Procedure (SOP) manual (Finlayson et al. 2018).

5. The stream will be posted according to NPDES requirements, providing information about rotenone product(s) to be applied, application date(s), and public use and water use restrictions, as well as contact information for WDFW project lead(s) and the DOE NPDES permit manager (DOE 2023).

## **9.0 RECREATIONAL IMPACT**

UWBL is managed under WDFW general fishing rules, including a standard stream fishing season (Saturday before Memorial Day–October 31) and statewide harvest rules for game fish. Statewide rules include no size restrictions or daily limit for Brook Trout. Recreational angling use of the UWBL drainage is limited. Most Brook Trout and Brown Trout in the Project Area are small (4-8 inches), offering little recreational-fishing value. Westslope Cutthroat Trout will provide limited angling opportunity following re-establishment of the population, but fish size will also be small. Hunting, wood gathering, berry picking, and hiking occur in the UWBL Project Area, but should not be adversely affected by the treatment.

## **10.0 ECONOMIC IMPACTS**

Economic impacts to the Project Area will be limited. Angling pressure is light in UWBL and contributes little to the local economy. Cost to conduct pre-treatment data collection and the proposed 2025 treatment should total around \$110,000. The project will be funded primarily by the Pend Oreille PUD #1 (FERC license obligation).

As noted previously, the re-establishment of WCT in UWBL is intended to provide some buffer against the listing of the species under the ESA. An ESA listing of WCT could impact area farming/ranching, logging, and mining operations, which comprise a portion of the Pend Oreille County economy.

## **11.0 RELATED MANAGEMENT ACTION**

See Section 1.0 (INTRODUCTION) for post-treatment fish reintroduction information. Following establishment of WCT, periodic surveys will be conducted to monitor population abundance, spatial distribution, and genetic metrics.

## **12.0 PUBLIC CONTACT**

Public meetings will be held in winter/spring 2025 online and/or in Pend Oreille County and Olympia to explain WDFW 2025 rehabilitation proposals, garner public input, and address

concerns.

### **13.0 PRE-TREATMENT ANALYTICAL METHODS USED FOR MONITORING**

The following pre-treatment monitoring is required by DOE (2023).

#### **13.1 Water Chemistry**

WDFW must collect pre-treatment measurements of water chemistry, including water temperature, dissolved oxygen, and pH, at a representative location in the stream treatment area within 24 hours prior to treatment. Pre-treatment water chemistry data will be collected from UWBL at the tFMS site using a YSI multimeter (Yellow Springs International/Xylem; Yellow Springs, OH).

#### **13.2 Potassium Permanganate Demand (PPD)**

WDFW must collect a pre-treatment measurement of organic demand within 24 hours prior to treatment. Organic demand is measured as potassium permanganate demand (PPD). Two ml of 25 ppm  $\text{KMnO}_4$  stock solution (25 mg  $\text{KMnO}_4$  in 1,000 ml distilled water) is added to 8 ml of stream water in a sample vial and swirled to mix. Using a Hach DR900 colorimeter, an initial measurement of  $\text{KMnO}_4$  concentration is collected immediately after combining stock solution and stream water, and a second measurement is made following 30 minutes of contact time in darkness. The second measurement is subtracted from the first, indicating the amount of  $\text{KMnO}_4$  consumed by stream water organic and/or chemical demand during the 30-minute contact period. Pre-treatment PPD will be measured from UWBL at the tFMS site.

#### **13.3 Volatile Organic Compounds (VOC)**

If potable water rights/withdrawals are present in the Project Area AND liquid rotenone is applied, WDFW must collect a water sample to test for background levels of VOCs. These samples are sent to an accredited environmental laboratory within 48 hours for processing. Sample analysis for VOC's is conducted at the lowest-possible detection levels. There are no potable water rights/withdrawals in the UWBL Project Area, so no VOC samples will be collected.

### **14.0 POST-TREATMENT ANALYTICAL METHODS USED FOR MONITORING**

The following post-treatment monitoring is required by DOE (2023).

#### **14.1 Water Chemistry**

WDFW must collect post-treatment measurements of water chemistry, including water temperature, dissolved oxygen, and pH within 24 hours following treatment. Post-treatment water chemistry data will be collected at the tFMS site using methods described

above (Pre-Treatment) except that PPD is not measured.

#### **14.2 KMnO<sub>4</sub>**

Beginning 60 minutes after initiation of deactivation, in-stream measurements of KMnO<sub>4</sub> concentration must be conducted hourly downstream of the treatment terminus throughout the period of toxicity. Measurements of in-stream concentration of KMnO<sub>4</sub> will be conducted at 30- and 60- minutes stream travel time downstream of the tFMS using a Hach DR 900 colorimeter to allow for adjustment of the application rate of 1% KMnO<sub>4</sub> solution to the stream. An average residual concentration of 0.5–2.0 ppm KMnO<sub>4</sub> will be maintained at 30-minutes travel time downstream, and an average residual concentration of 0.0–1.0 ppm KMnO<sub>4</sub> will be maintained at 60-minutes travel time.

#### **14.3 Trout Toxicity Bioassay**

Beginning immediately prior to rotenone application, caged sentinel fish (triploid Rainbow Trout fingerlings) must be monitored for survival. Sentinel fish will be placed 5 m above the deactivation station at the tFMS, at 30-minutes stream travel time downstream, and at 60-minutes travel time downstream to determine rotenone toxicity immediately above and within the deactivation zone. Deactivation must continue until sentinel fish, placed above the deactivation station, survive for 24 consecutive hours (100% of sentinel fish from a given cage must survive the 24-hr period).

#### **14.4 Water Withdrawals**

##### **1. Potable Water Rights**

Potable water withdrawals from the treated water body must cease prior to treatment and cannot resume until ***BOTH*** following conditions are met:

- **Rotenone concentration**

Potable water withdrawals within the Project Area may resume only after rotenone concentration in the treated waterbody falls below 40 ppb (active ingredient). Rotenone concentrations must be analyzed by methods listed in SOP 16 of the Rotenone SOP manual (Finlayson et al. 2018), which includes bioassay with salmonids. Bioassay must be conducted in locations representative of potable withdrawals within the Project Area, and result in 100% survival of bioassay fish at all locations before potable withdrawals may resume. Bioassay must be conducted at a minimum of three locations, or at the number of locations equal to 20% of the number of potable withdrawals within the Project Area, whichever number of locations is greatest. There are no potable water rights/withdrawals in the UWBL Project Area.

- **Volatile Organic Compounds (VOC)**

Following treatment, WDFW will collect periodic water samples to test levels of VOCs. These samples will be sent to an accredited environmental laboratory within 48 hours for processing. Sample analysis for VOC's is conducted with minimum detection levels at or below 0.5 ppb. Potable water withdrawals may not resume until VOCs return to background (pre-treatment) levels or fall below 0.5 ppb.

2. **Irrigation or Livestock Withdrawals:** WDFW must demonstrate that the treated waterbody meets standards applicable to crop irrigation and livestock watering required by the FIFRA label for the rotenone product used before withdrawals can resume. There are no irrigation or livestock watering water rights within the UWBL Project Area. Currently, there are also no livestock watering restrictions for the rotenone or KMnO4 products proposed for use in this treatment.

## **15.0 REFERENCES:**

- Andonaegui, C. 2003. Bull trout limiting factors: For Water Resource Inventory Area (WRIA) 62 (Pend Oreille County, northeast Washington state). Report to the Washington State Conservation Commission, Olympia, Washington.
- Baker, W. P., and B. M. Walker. 2019. 2019 post treatment and discharge monitoring report for upper Flume Creek, Pend Oreille County, Washington. Washington Department of Fish and Wildlife, Spokane.
- Behan, B. 2018. Intra-service Section 7 Biological Assessment Form. Re: WAF18AF01092, Lake and Stream Rehabilitation (Rotenone Treatments) to Improve Freshwater Sportfishing. United States Fish and Wildlife memo to Washington Department of Fish and Wildlife.
- Behan, K. 2023. Discharge management plan for the Washington Department of Fish and Wildlife Lake and Stream Rehabilitation Program. Washington Department of Fish and Wildlife, Olympia.
- Billman, H.G., C. G. Kruse, S. St. Hilaire, T. M. Koel, J. L. Arnold, and C. R. Peterson. 2012. Effects of rotenone on Columbia Spotted Frogs *Rana luteiventris* during field applications in lentic habitats of southwestern Montana. *North American Journal of Fisheries Management*, 32:781-789.
- Bradbury, A. 1986. Rotenone and trout stocking. Washington Department of Game, Fisheries Management Division. Fisheries Management Report 86-2.
- Cegelski, C. 2022. Intra-service Section 7 Biological Assessment Form. Re: WA F21AF04126, Lake and Stream Rotenone Treatments. United States Fish and Wildlife memo to Washington Department of Fish and Wildlife.

- Darwin, L. H. 1917. Twenty-sixth and twenty-seventh annual reports of the State Fish Commissioner to the Governor of the State of Washington: April 1, 1915 to March 31, 1917. Frank M. Lamborn Public Printer, Olympia, Washington.
- Finlayson, B., D. Skaar, J. Anderson, J. Carter, D. Duffield, M. Flammang, C. Jackson, J. Overlock, J. Steinkjer, and R. Wilson. 2018. Planning and standard operating procedures for the use of rotenone in fish management – rotenone SOP manual, 2<sup>nd</sup> edition. American Fisheries Society, Bethesda, Maryland.
- Grisak, G. G., D. R. Skaar, G. L. Michael, M. E. Schnee, and B. L. Marotz. 2007. Toxicity of Fintrol (antimycin) and Prenfish (rotenone) to three amphibian species. *Intermountain Journal of Sciences*, 13:1-8.
- Knudsen, C. 2020. Memorandum: Water right summary – West Branch LeClerc fish removal. Memorandum from C. Knudsen (WDFW) to B. Walker (WDFW), 9/24/2020. Washington Department of Fish and Wildlife, Wildlife Program Lands Division, Real Estate Services, Olympia.
- Ling, N. 2003. Rotenone – a review of its toxicity and use for fisheries management. *Science for Conservation #211*. New Zealand Department of Conservation, Wellington.
- Maroney, J. R., and T. A. Andersen. 2000. Habitat inventory and salmonid abundance for West Branch LeClerc Creek. Prepared for Pend Oreille County Public Utility District #1. Kalispel Tribe of Indians Natural Resource Department, Usk, Washington.
- McGann, B., and A. Strecker. 2018. Effects of rotenone on zooplankton communities: Summary report. Report to Washington Department of Fish and Wildlife. Portland State University, Portland, Oregon.
- Scholz, A. T., J. Smith, A. Maifeld, J. McMillan, and L. Conboy. 2014. Fishes of eastern Washington: A natural history, Volume 3. Biology Faculty Publications. Paper 14. Eastern Washington University, Cheney. [http://dc.ewu.edu/biol\\_fac/14](http://dc.ewu.edu/biol_fac/14)
- Shepard, B. B., B. E. May, and W. Urie. 2003. Status of westslope cutthroat trout (*Oncorhynchus clarki lewisi*) in the United States: 2002. Westslope Cutthroat Trout Multi-state Assessment. Westslope Cutthroat Interagency Conservation Team, Bozeman, Montana.
- United States Federal Energy Regulatory Commission (US-FERC). 2005. Order issuing new license: Public Utility District No. 1 of Pend Oreille County. Project # 2042-013. United States of America, Washington D. C.
- United States Federal Energy Regulatory Commission (US-FERC). 2008. Settlement agreement for Order issuing new license: Public Utility District No. 1 of Pend Oreille County. Project # 2042-013. United States of America, Washington D. C.



- United States Fish and Wildlife Service (USFWS). 2023. West Branch LeClerc Creek Fish Management Structure Project; Pend Oreille County, Washington. Endangered Species Act – Section 7 Consultation. Biological Opinion. U.S. Fish and Wildlife Service Reference: 2023-0050025. U.S. Fish and Wildlife Service, Spokane, Washington.
- Vadala, C. 2023. Upper West Branch LeClerc Creek fish management structure, fish salvage, and piscicide treatments. Decision memo. United States Forest Service, Colville National Forest, Newport-Sullivan Ranger District. Newport, Washington.
- Walker, B. M., N. J. Bean, S. Harvey, W. P. Baker, and J. A. Olson. 2022. Upper West Branch LeClerc Creek native fish restoration phase 1: Pre-treatment data collection – Progress Report. Prepared for the Box Canyon Hydroelectric Project Technical Committee. Washington Department of Fish and Wildlife, Spokane, and Kalispel Tribe of Indians Natural Resource Department, Usk, Washington.
- Walker, B. M., N. J. Bean, S. Harvey, W. P. Baker, and J. A. Olson. 2024. Upper West Branch LeClerc Creek native fish restoration phase 2: Proposed piscicide treatment – Implementation Plan. Prepared for the Box Canyon Hydroelectric Project Technical Committee. Washington Department of Fish and Wildlife, Spokane, and Kalispel Tribe of Indians Natural Resource Department, Usk, Washington.
- Walker, B. M., B. Heiner, W. P. Baker, S. R. Dotts, and J. Peterson. 2015. Prioritization of fish passage barriers in the Pend Oreille River basin (WRIA 62). Washington Department of Fish and Wildlife, Colville.
- Washington Department of Ecology (DOE). 2023. Aquatic and invasive species control general permit: National Pollutant Discharge Elimination System and State Waste Discharge General Permit. Washington Department of Ecology, Olympia.
- Washington Department of Fish and Wildlife (WDFW) and Kalispel Tribe of Indians Natural Resource Departments (KNRD). 2020. Upper West Branch LeClerc Creek native fish restoration – Phase 1: Pre-treatment data collection. Project Proposal to Box Canyon Hydroelectric Project Technical Committee. WDFW, Spokane, and KNRD, Usk, Washington.