

Smalle Creek Westslope Cutthroat Trout Translocation Framework

Summary of Project Background, Methods, and Translocation Options

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This document provides a framework for introduction of Westslope Cutthroat Trout to Smalle Creek, Calispell Creek Watershed, Pend Oreille County, WA, following three piscicide treatments to remove non-native Brook Trout.

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1. INTRODUCTION

On July 11, 2005, Public Utility District No. 1 of Pend Oreille County (PUD) was awarded a 50-year Federal Energy Regulatory Commission (FERC) license for operation of the 72-megawatt Box Canyon Hydroelectric Project (hereafter Project; FERC No. 2042-013), located on the Pend Oreille River in Pend Oreille County, Washington. The license (and subsequent settlement agreement on December 11, 2008) stipulates that the PUD is responsible for restoration of 164 miles of Pend Oreille River tributary streams (FERC 2005). Restoration is specifically defined by the settlement agreement to include non-native fish removal and reintroduction of target fish species, including Westslope Cutthroat Trout *Oncorhynchus clarki lewisi* (WCT).

Westslope Cutthroat Trout are native to the Pend Oreille River basin in northeastern Washington (Gilbert and Evermann 1895), and historically occupied the majority of streams in the watershed (Andersen 2008). Logging, road construction, mining, and agriculture have combined with the construction of three dams on the mainstem Pend Oreille River to degrade habitat and block fish passage (Baker et al. 2014). Non-native salmonids were also introduced into many areas of the Pend Oreille Basin, establishing self-perpetuating populations (WDFW unpublished stocking data; Andersen 2008). Habitat losses, combined with competition, predation, and hybridization with non-native fishes, have greatly reduced numbers of WCT in the Pend Oreille River watershed (Shepard et al. 2003). Sampling indicates that WCT are currently found in fewer than 35% of streams in the basin, and that WCT distribution and population sizes are shrinking (e.g., Cee Cee Ah Creek prior to 2011; Andersen 2008). Pure (non-hybridized) populations of WCT in the Pend Oreille watershed are now typically found only above fish passage barriers that prevent invasion from downstream populations of non-native salmonids (Small et al. 2007).

Following declines of WCT abundance and range (Andersen 2008), cooperative efforts between Washington Department of Fish and Wildlife (WDFW) and the Kalispel Tribe of Indians Natural Resource Department (KNRD) began in 2008 to restore native WCT to selected stream segments in Pend Oreille County. A pilot non-native fish eradication/WCT restoration project jointly sponsored by WDFW and KNRD on Cee Cee Ah Creek, a tributary to the Pend Oreille River, was successfully conducted between 2008 and 2012 (Baker and Donley 2009, 2010, Andersen 2012, Andersen and Bean 2013). The restored WCT population in Cee Cee Ah Creek was estimated to be 4,820 fish in 2016 (KNRD unpublished data).

Smalle Creek (Figure 1) is an easterly flowing tributary to Calispell Creek (tributary to the Pend Oreille River) in south-central Pend Oreille County. Upper Smalle Creek (above Smalle Creek Falls) was identified as a viable candidate for non-native fish eradication/WCT restoration in 2013 (Walker et al. 2014). Like Cee Cee Ah Creek, Smalle Creek was uniquely suited to WCT restoration due to the presence of a natural barrier to prevent reinvasion by non-native fish, excellent habitat, and a fish community composed solely of non-native Brook Trout in the project area. In partial fulfillment of its FERC license requirements, the PUD contracted with

WDFW and KNRD in 2015 to conduct non-native fish eradication and WCT restoration on Upper Smalle Creek. Rotenone treatments were conducted in 2015-2017, which removed in excess of 6,500 Brook Trout (Walker and Baker 2015, Baker and Walker 2016, 2017). Environmental DNA (eDNA) sampling in 2018 and 2019 led to the removal of 3 additional Brook Trout via targeted backpack electrofishing. No fish were collected from a single location that repeatedly tested positive for low levels of Brook Trout DNA, however, intensive follow-up electrofishing surveys in both years could not locate the source of the DNA. Extensive eDNA, electrofishing, and visual surveys throughout the Smalle Creek watershed in 2018 and 2019 did not locate any young of year (YOY) Brook Trout, indicating that functional extirpation has been achieved. WDFW and KNRD now propose to introduce native WCT to the treated area.

2. STUDY AREA

Smalle Creek joins Calispell Creek approximately 2 km from Cusick, Washington, in Pend Oreille County. Two waterfalls, Hansen Falls at rkm 9.90 and Smalle Creek Falls at rkm 11.67 (Figure 2) create fish passage barriers, providing protection from re-invasion by downstream populations of non-native fish. Whether upper Smalle Creek was historically fish-bearing is unknown, but East Fork Smalle Creek, tributary to Smalle Creek below Smalle Creek Falls, has an allopatric population of genetically pure WCT above fish passage barriers in its drainage. Smalle Creek was planted annually with Brook Trout from 1933-1938 and again in 1980-1981. The portion of Smalle Creek above Smalle Creek Falls was treated with rotenone once annually from 2015-2017 to remove non-native Brook Trout.

3. PERMITTING

Permits and licenses required for implementation of the proposed 2019 introduction of WCT to Smalle Creek are listed below.

3.1 State Environmental Policy Act (SEPA)

A SEPA checklist for introduction of WCT must be submitted to the WDFW SEPA coordinator for review and public comment prior to stocking a species of fish into a specific waterbody for the first time. The SEPA checklist will be accompanied by this framework document.

3.2 USDA Forest Service Special Use Permit

The Smalle Creek treatment area is primarily located on property owned by the Colville National Forest, United State Forest Service (USFS). The USFS required a Special Use Permit (SUP) to authorize access for the Smalle Creek WCT introduction (SUP # NEW14, received August 6, 2015).

4. FISH HEALTH

Westslope Cutthroat Trout are native to the Smalle Creek watershed. Fish translocated to Smalle Creek will be collected exclusively from within the Pend Oreille River Basin, thus minimizing the risk of pathogen and parasite transfer into the Smalle Creek watershed.

5. METHODS

Translocation of WCT to Smalle Creek will occur in fall 2019 or spring 2020, as lower water temperatures reduce handling stress, increasing survival of captured donor fish. Translocated adult fish are available to spawn the following spring and contribute to the newly restored population (Small et al. 2017). Sub-adult fish mature over time to replace adult fish as they age out of the population, ensuring that there is no gap in fry production (Walker et al. 2015).

5.1 Westslope Cutthroat Trout Donor Stock Collection

Westslope Cutthroat Trout donor stock will be collected using a Smith Root LR-24 (or equivalent) backpack electrofishing unit fished with pulsed-DC at the lowest voltage, amperage, and frequency setting adequate to collect fish without injury. To achieve a mixture of adult and sub-adult fish, captured fish will be assigned to a size bin based on fork length (FL) (Table 1). One quarter (25%) of translocated fish will be from Size Class 1 (juvenile; 70-100 mm), 50% of translocated fish will be Size Class 2 (sub-adult; 101-150 mm), and 25% will be Size Class 3 (adult; 151-200 mm). Retained fish will be measured for FL (mm), weighed (g), marked by clipping the adipose fin, and tissue sampled for genetic analysis. Selected WCT will then be transported to Smalle Creek (Photo 1).

5.2 Westslope Cutthroat Trout Translocation

Translocated fish will be held near release locations in covered totes or pens (Figure 1) for 24 hours prior to release to assess handling mortality. Holding containers will be perforated to allow stream flow to move freely through the container. Smalle Creek will be divided into six reaches (Figure 1), and each section will receive a specified number of fish (Tables 2-7). Following the 24-hour holding period, fish will be removed from the tote, placed into buckets, and scatter-planted throughout the assigned section of mainstem Smalle Creek (Photo 2).

5.3 Westslope Cutthroat Trout Donor Stock(s)

Few genetically pure (<1% introgression) populations of WCT occur in the Pend Oreille River Watershed (Small et al. 2017). Thus, use of an admixture of local WCT stocks is deemed appropriate for establishment of WCT in Smalle Creek. Combined, populations in East Fork Smalle and Middle creeks are sufficiently robust (population density and genetic diversity) to provide donor fish (Small et al. 2007).

5.3.1 East Fork Smalle Creek WCT

East Fork Smalle Creek WCT have been repeatedly demonstrated to have < 1% Rainbow Trout introgression (Trotter et al. 2001; Small et al. 2007; Small et al. 2017), and were used as a donor stock for translocation into Cee Cee Ah Creek following non-native fish eradication (Andersen 2012, Andersen and Bean 2013). Effective population size ($N_e = 12$; WDFW unpublished data), gene diversity (0.342) and allelic richness (2.51) are considered low for the East Fork Smalle Creek population (Small et al. 2007), but it is one of only a few known pure WCT populations that are large enough to support establishment of a new population without harming the donor

population. Although the values for genetic measures are low, sufficient diversity exists to allow use of East Fork Smalle Creek fish as donor stock (Maureen Small, WDFW Geneticist, pers. comm.). This population is well adapted to the habitat and environmental conditions found throughout the Pend Oreille Basin, and has performed well as a donor stock thus far in Cee Cee Ah Creek.

5.3.2 Middle Creek WCT

The Middle Creek WCT stock was also a donor for Cee Cee Ah Creek translocations in 2011. The Middle Creek WCT population has a moderate N_e (70), as well as substantially greater gene diversity (0.429) and allelic richness (3.39) than the East Fork Smalle Creek population (Small et al. 2007). The Middle Creek population is relatively large in comparison to most pure WCT populations in lower Pend Oreille River tributaries (Young et al. 2004).

6. MONITORING

Monitoring in during the initial year following introduction (2020) will be conducted via snorkeling to avoid undue impact on the newly established WCT population. Snorkel surveys will consist of counts of adult and juvenile fish to confirm successful reproduction. Monitoring via electrofishing will begin in fall 2021. One 100-m index reach will be established in each of the six stream segments identified in section 6.3. Block netted index reaches will be electrofished, and population estimates, by reach, will be generated using multiple-pass depletion (Murphy and Willis 1996; Heimbuch et al. 1997). Young-of- year captured on the first pass will be counted and transported above or below the index reach and released without further handling. Age 1+ fish will be enumerated, measured for FL (mm) and weight (g), inspected for an adipose fin clip, and released. Age-1 fish will be tissue sampled for genetic analysis to determine parentage.

Monitoring in 2022 will mirror that occurring in 2021, except that age-1 and age-2 fish will be tissue sampled to determine parentage, and eDNA samples will be collected in tributaries and the headwaters (mainstem upstream of Section 1) to determine if geographic expansion of the newly restored population is occurring in these areas. Monitoring of population abundance, demographics, and spatial distribution will continue beyond 2022 on a biennial basis. It is recommended that genetic assessment of the population be conducted once every 10-15 years following 2022. If genetic bottleneck or other problems are detected, additional translocations of genetically pure WCT can be conducted.

7. EFFECTS OF TRANSLOCATION ON DOWNSTREAM FISH POPULATIONS

The introduced WCT population should not impact fish populations outside of the project area. Westslope Cutthroat Trout in the Pend Oreille Basin rarely emigrate from their home stream (R. Simmons, SCL Fish Biologist, pers. comm.). Small et al. (2007) found very little genetic

exchange between discrete populations of WCT within the Pend Oreille River and its tributaries. Interactions between introduced WCT and Endangered Species Act (ESA)-listed Bull Trout *Salvelinus confluentus* are unlikely. However, the species co-occur in many locations throughout the Columbia Basin. Thus, no negative interactions would be anticipated.

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9. FIGURES

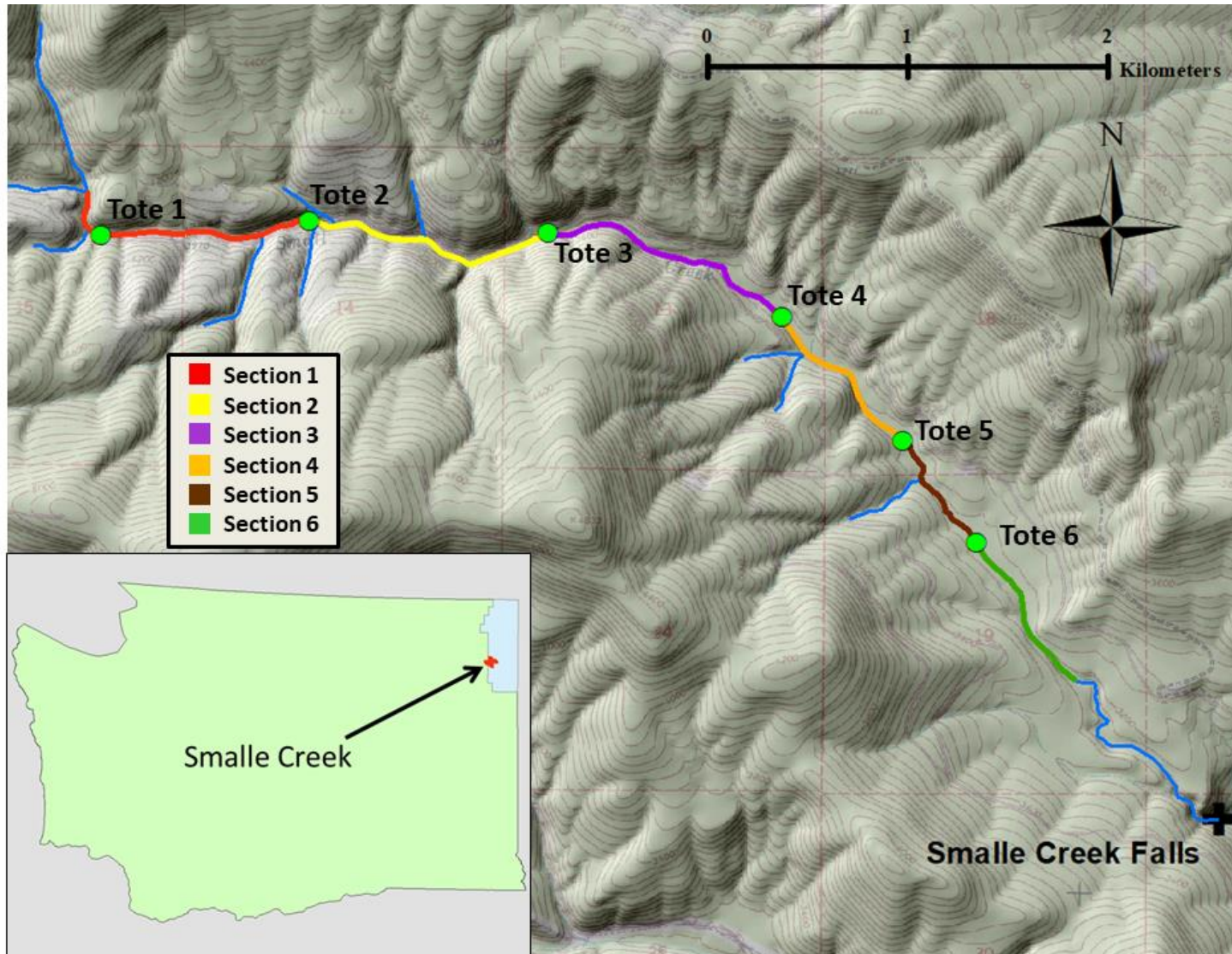


Figure 1. Smalle Creek Westslope Cutthroat Trout introduction reaches within Smalle Creek, Pend Oreille Co., Washington State.

10. TABLES

Table 1. Number of WCT by size class proposed for translocation into Smalle Creek.

Source	Translocation Total			Total
	70-100 mm	101-150 mm	151-200 mm	
EF Smalle	63	125	62	250
Middle	62	125	63	250
Total	125	250	125	500
% of Total	25	50	25	

Table 2. Number of WCT by size class proposed for translocated into Section 1 of Smalle Creek.

Source	Section 1			Total
	70-100 mm	101-150 mm	151-200 mm	
EF Smalle	8	15	7	30
Middle	7	15	8	30
Total	15	30	15	60

Table 3. Number of WCT by size class proposed for translocation into Section 2 of Smalle Creek.

Source	Section 2			Total
	70-100 mm	101-150 mm	151-200 mm	
EF Smalle	9	18	8	35
Middle	9	17	9	35
Total	18	35	17	70

Table 4. Number of WCT by size class proposed for translocation into Section 3 of Smalle Creek.

Source	Section 3			Total
	70-100 mm	101-150 mm	151-200 mm	
EF Smalle	9	17	9	35
Middle	8	18	9	35
Total	17	35	18	70

Table 5. Number of WCT by size class proposed for translocated into Section 4 of Smalle Creek.

Source	Section 4			Total
	70-100 mm	101-150 mm	151-200 mm	
EF Smalle	12	25	13	50
Middle	13	25	12	50
Total	25	50	25	100

Table 6. Number of WCT by size class proposed for translocation into Section 5 of Smalle Creek.

Source	Section 5			Total
	70-100 mm	101-150 mm	151-200 mm	
EF Smalle	13	25	12	25
Middle	12	25	13	35
Total	25	50	25	100

Table 7. Number of WCT by size class proposed for translocation into Section 6 of Smalle Creek.

Source	Section 6			Total
	70-100 mm	101-150 mm	151-200 mm	
EF Smalle	12	25	13	50
Middle	13	25	12	50
Total	25	50	25	100

11. PHOTOGRAPHS



Photo 1. Transporting trout for out-planting.



Photo 2. Scatter-planting trout.