

STREAM MANAGEMENT PLAN

Water(s): Flume Creek (Pend Oreille Co.)

Location: Flume Creek joins Boundary Reservoir approximately 2 miles north of Metaline, Washington.

	Distance:	Max Depth:	Discharge:
Upper Flume Creek	5.13 miles	N/A	3-5 cfs
Lower Flume Creek	6.0 miles	N/A	4-8 cfs

Water Source: Numerous springs and seeps, rainfall and snowmelt run-off.

Outflow: Tributary to Boundary Reservoir (Pend Oreille River).

Management History:

Westslope Cutthroat Trout (WCT) *Oncorhynchus clarki lewisi* are native to the Pend Oreille River watershed in Washington, but have declined in abundance and range. With the decline of WCT abundance and range, cooperative efforts between Washington Department of Fish and Wildlife (WDFW), Seattle City Light (SCL), and the Kalispel Tribe of Indians Natural Resource Department (KNRD) are underway in Pend Oreille County to restore native WCT to selected stream sections. Sampling in the Flume Creek watershed by R2 (1998), WDFW (McLellan and O'Connor 2001, WDFW unpublished data), Terrapin Environmental (2017), and KNRD (Bean et al. 2017) revealed a simple fish community consisting of Brook Trout and Westslope Cutthroat Trout. Sculpin *Cottus spp.* were reported by West Fork Environmental (WFE) in lower Flume Creek above the falls (WFE 2012), but the report may have been in error as Sculpin have not been observed in other surveys (R2 1998; McLellan and O'Connor 2001; Terrapin 2017) or recent focused attempts to collect them (KNRD unpublished data, WDFW unpublished data). The salmonid species occupying the drainage are geographically partitioned, with Brook Trout inhabiting most of the watershed and WCT limited to headwater areas above Brook Trout distribution. Flume Creek was stocked with Brook Trout between 1933–1944 and in 1981, but no stocking records were found for WCT in the basin (WDFW unpublished data). Genetic sampling of WCT in the Flume Creek watershed in 2012 revealed a high degree of relatedness between Flume Creek WCT and the WDFW Kings Lake WCT broodstock (WFE 2012; Small et al. 2015; Small et al. 2017). Whether WCT are endemic to the Flume Creek drainage is unknown, but genetic data suggests that undocumented stockings of Kings Lake-origin WCT likely occurred in the Flume Creek watershed at some point in the past.

The Flume Creek watershed is well-suited to nonnative fish eradication via piscicide treatment due to the presence of complete upstream fish passage barriers (natural waterfall and temporary fish management structure; tFMS – see below) and geographic isolation of native species in the drainage above non-native fish distribution. Washington Department of Fish and Wildlife, in partnership with KNRD and SCL, began conducting annual piscicide treatments using rotenone to remove Brook Trout from the Flume Creek drainage above the waterfall in August 2019 (Baker and Walker 2019), with a second treatment completed in 2020 (Baker and Walker 2020).

A tFMS was constructed on mainstem Flume Creek in October 2019 approximately 0.25 miles downstream of the confluence with Middle Fork Flume Creek to facilitate effective treatment of the watershed. Treatment of the portion of the watershed above the proposed tFMS (proposed here) will be completed first, with non-native fish eradication proceeding below the tFMS following confirmation of Brook Trout removal above the structure. Reintroduction of native WCT will occur in treated areas following eradication of Brook Trout.

Flume Creek has been managed under WDFW general stream regulations, including no limit and no size restrictions for Brook Trout and a 2 fish limit with 8" minimum size for all other trout.

T&E Flora and Fauna: Professionals from multiple resource agencies have visited this site over the last 50 years. No known report exists of any threatened or endangered species habitually found in or near this stream. Occasional visits from both bald *Haliaeetus leucocephalus* and golden *Aquila chrysaetos* eagles occur, although no nests of these two species are known in the area. The upper Flume Creek treatment area is located within the home range of the Salmo Pack of wolves *Canis lupus*, but wolves are unlikely to be present in the area during treatment due to increased human presence, traffic, and activity in the days surrounding treatment.

Current Management Objectives:

This project has two objectives:

1. Eradicate non-native Brook Trout from Flume Creek and its tributaries above the tFMS.
2. Re-establish WCT throughout Flume Creek and its tributaries above the tFMS.

The successful achievement of Objective 1 will be achieved when non-native Brook Trout are completely removed from the project area. Follow-up environmental DNA (eDNA) sampling will be utilized to confirm eradication of Brook Trout. Reproducing populations of WCT, expanding both in population size and spatial distribution, would indicate completion of Objective 2. Achievement of Objective 2 may take multiple years.

1. Fishery Objectives:

None - While this fishery may experience light angling pressure, species restoration and conservation are the main goals of this action. Westslope Cutthroat Trout size will be small (generally < 6 inches in length), and the fishery is unlikely to receive much interest from the general public.

2. Angler use objective: 0 days

3. Stocking Objectives:

Number of Fish Stocked					
<u>Stream</u>	Species	Total	Fish/ Acre	FPP	Planting Month
Flume Creek	WCT	300	N/A	4-50	Summer/Fall 2021 or 2022; translocation from Slate Creek
Flume Creek	WCT	3,000	N/A	4-50	Summer/Fall 2023-2025; SCL Native Salmonid Conservation Hatchery Facility

Management Strategy:

1. Ensure non-native fish eradication above the tFMS (or have not been illegally reintroduced).
2. Stock approximately 300 genetically pure WCT via translocation from Slate Creek in upper Flume Creek following eradication of Brook Trout (expected to occur in 2021 or 2022). Follow-up stocking from the SCL Native Fish Conservation Hatchery Facility (estimated to begin in 2023).
3. Monitor the restored WCT population through electrofishing to assess population size, spatial distribution, and genetic metrics.