

Alberta Conservation Association
2018/19 Project Summary Report

Project Name: Westslope Cutthroat Trout Population Monitoring in the Upper Oldman River Core Area

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Partnerships

Alberta Environment and Parks

Key Findings

- Westslope cutthroat trout comprised 84% of our fish catch (n = 1,635) and were captured at 38 of 39 sample sites.
- Our catch of westslope cutthroat trout (total fish, juveniles, and adults) was highest in the Livingstone River watershed followed by the upper Oldman River watershed, and lowest in the Dutch Creek and Hidden Creek watersheds.
- Hidden Creek had the lowest catch rate of Westslope cutthroat trout but the largest average fish size in our study area.

Introduction

In 2018, the Government of Alberta implemented the Livingstone-Porcupine Hills Land Footprint Plan to reduce cumulative impacts on the landscape by changing land-use patterns to allow existing land use footprints to recover (Alberta Environment and Parks 2018). The resulting Public Land Use Zone (PLUZ), encompasses key Westslope cutthroat trout (WSCT) core habitat areas and incorporates WSCT recovery goals by reducing impacts via strict motorized vehicle access restrictions within the upper Oldman River (UOM) WSCT core area. Upon implementation of the PLUZ, we initiated year-one of a multi-year WSCT population monitoring study to determine natural fish population variation within the UOM core area. Our results will be used to assess fish population response to the new PLUZ restrictions, and to proposed systematic landscape remediation activities under the Eastern Slopes Restoration Strategy, within the Land Footprint Plan. Our study objective is to determine WSCT abundance, distribution, and population structure in four HUC10 (hydrological unit code 10) watersheds in the UOM core area to monitor population trends over time.

Methods

In 2018, we established and sampled 39 electrofishing reference sites across four HUC10 watersheds in the UOM WSCT core area, 17 in the Livingstone River, 12 in the upper Oldman River, five in the Dutch Creek, and five in the Hidden Creek watersheds (Figure 1). We allocated sample sites optimally based on past variance in catch-per-unit-effort (CPUE), and selected sites using Generalized Random Tessellation Stratification (GRTS) stratified by stream order. Site lengths were 300 m for backpack electrofishing and 500 m for tote electrofishing. We completed all fish sampling surveys between July 4 and August 29, collecting species and fish measurements (fork length [FL] and total length [TL] [mm], and weight [g]). We determined population relative abundance and variance per HUC10 watershed for comparison with future sampling events.

Results

We captured 1,635 fish in four major HUC10 watersheds in the UOM core area in 2018 (Table 1). Westslope cutthroat trout was the most abundant species comprising 84% (n = 1,377) of the catch and was captured at all sites except for one. Median total catch rates of WSCT were highest in the watersheds of the Livingstone River at 9 fish/100 m and upper Oldman River at 8.8 fish/100 m, and lowest in Dutch Creek at 1.3 fish/100 m, and Hidden Creek at 1.0 fish/100 m (Table 1). Similarly, catch rates of both adult (≥ 150 mm FL) and juvenile (≥ 70 mm - ≤ 149 mm FL) cutthroat trout were highest in the Livingstone River followed by the upper Oldman River watersheds, and lowest in Dutch and Hidden Creek watersheds. Conversely, average fish size was the largest in the Hidden Creek watershed where few juveniles were captured (Table 2).

Conclusions

We completed our first round of fish sampling in the UOM WSCT core area and will repeat fish sampling at reference sites for five years. Results from our sampling series will be used to monitor changes in population abundance and structure in response to the new PLUZ land-use restrictions and proposed habitat restoration activities in the UOM core area.

Table 1. Westslope cutthroat trout catch rates by HUC10 watershed in the upper Oldman westslope cutthroat trout core area, 2018.

Watershed	Size class	CPUE (fish/100 m)
		Median (\pm SE)
Livingstone River	All (≥ 70 mm)	9.0 \pm 2.44
	Adult (≥ 150 mm)	4.0 \pm 1.13
	Juvenile (< 149 mm)	4.0 \pm 1.83
Upper Oldman River	All (≥ 70 mm)	8.8 \pm 3.63
	Adult (≥ 150 mm)	3.4 \pm 1.13
	Juvenile (< 149 mm)	3.1 \pm 1.13
Dutch Creek	All (≥ 70 mm)	1.3 \pm 0.87

	Adult (≥ 150 mm)	1.0 ± 0.67
	Juvenile (< 149 mm)	1.0 ± 0.74
	All (≥ 70 mm)	1.0 ± 1.29
Hidden Creek	Adult (≥ 150 mm)	1.0 ± 0.81
	Juvenile (< 149 mm)	$0 \geq$

Table 2. Summary of length measurements of westslope cutthroat trout captured in the upper Oldman westslope cutthroat trout core area, 2018.

HUC10 watershed	Fork length (mm)		n
	Mean (\pm SD)	Range	
Upper Oldman River	146.9 ± 75.9	33 - 425	521
Livingstone River	142.4 ± 82.8	28 - 421	776
Dutch Creek	137.2 ± 68.4	55 - 313	40
Hidden Creek	201.2 ± 76.4	78 - 394	38

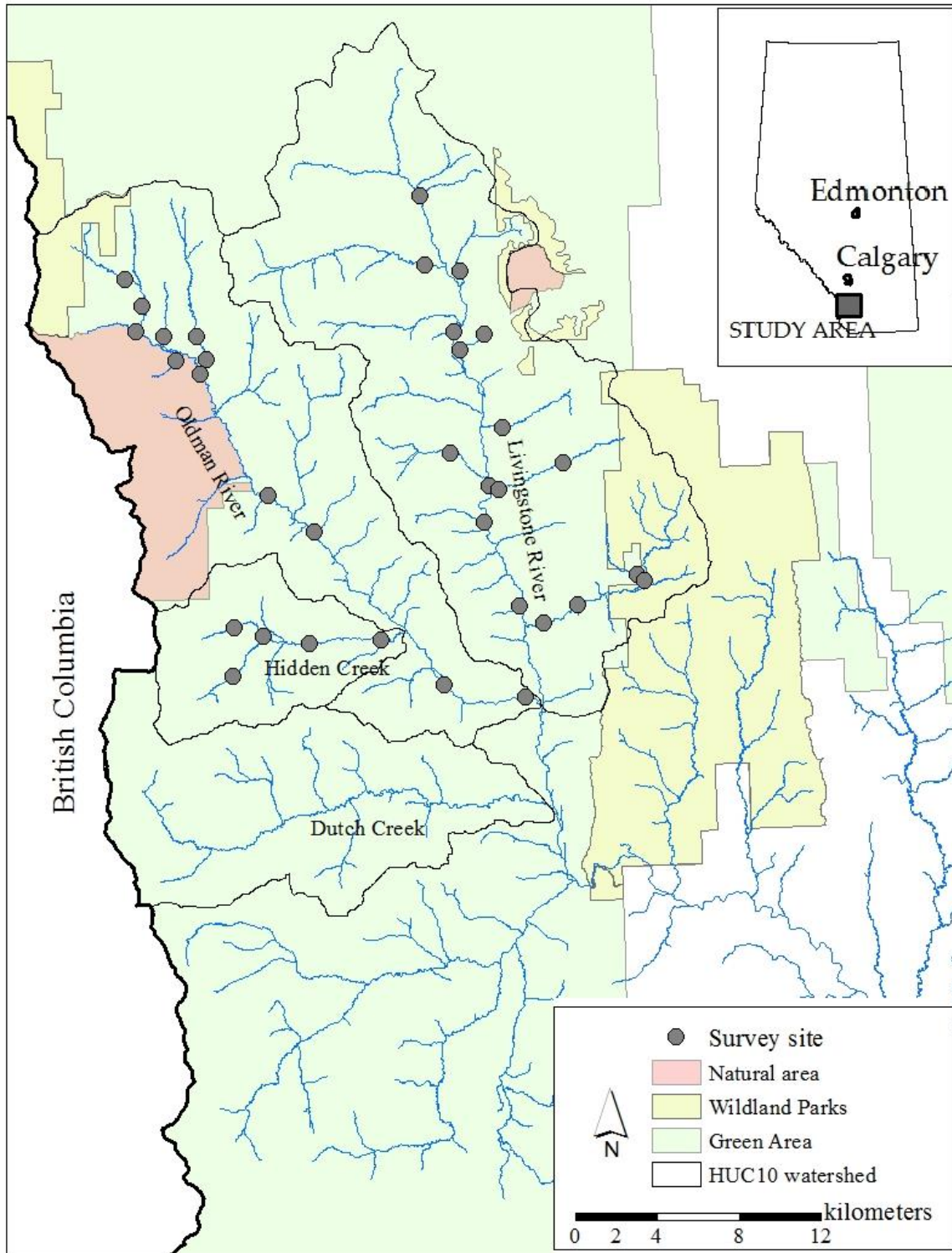


Figure 1. Electrofishing reference sites in the upper Oldman westslope cutthroat trout core area, 2018.

Communications

We presented our 2018/19 catch results to AEP fisheries managers in 2018.

Literature Cited

Alberta Environment and Parks, 2018. Livingstone – Porcupine Hills Land Footprint Management Plan. Government of Alberta. ISBN No.978-1-4601-3965-3. Available at: <http://aep.alberta.ca/land/programs-and-services/land/programs-and-resource-planning/regional-planning/south-saskatchewan-region/default.aspx>. ISBN 1-4601-3966-0

Photos



Photo. ACA staff tote electrofishing in the Livingstone River. Photo: Jason Blackburn



Photo. Westslope cutthroat trout recovering after being measured and released from capture.
Photo: Jason Blackburn



Photo. ACA staff, Britt Schmidt and Nikita Lebedynski, backpack electrofishing a stream in the Upper Oldman WSCT core area. Left to right:. Photo: Brad Hurkett