

# KIDS CREEK RESTORATION PROJECT

## PRELIMINARY BASELINE FISH MONITORING SUMMARY

This summary report presents the pre-construction phase fisheries collection data for the Kids Creek restoration project. Following restoration of the road crossings, post-construction sampling will occur. Post-construction data will then be compared to the pre-construction data compiled within this report, to assess any potential changes. The document outlines the methods used to complete the monitoring and provides a summary of the data collected to date.

### Methods

A Haltech HT-2000 backpack electrofisher was used to sample approximately 3,500 feet of Kids Creek (Figure 1). The electrofisher was set to 60 Hz DC output between 150 V and 250 V, depending on conductivity. Sampling proceeded in an upstream direction, covering areas downstream and upstream of the proposed road crossing restorations, as well as within the areas of direct impact (Figure 1). Stunned fish were netted and placed in buckets filled with fresh water. Following capture, fish were enumerated, identified to the species level, measured to the nearest mm (fork length [FL] for salmonids, total length [TL] for all other species), and released. The time from capture to release typically did not exceed 30 minutes.



### Data analysis

To understand the composition of the fish assemblage present within the Kids Creek restoration area, data were assessed for species composition (richness) and abundance. Reach 1 consisted of an area downstream of the road crossing restoration sites. Reach 2 contained the areas where the restorations would occur. Reach 3 was the site upstream of all restoration activities. Catch per unit effort (CPUE; an indirect measure of abundance) was calculated as:

$$CPUE = \frac{n}{t}$$

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Where  $n$  = the number of individuals sampled, and  $t$  = the length of the sampling time in minutes. The CPUE for Reach 1 was not be recorded accurately in the field and is not included. Size distributions of Brown Trout (*Salmo trutta*) captured were converted from mili-meters to inches and visualized using histograms. Other species either contained too few numbers captured or exhibited little variation in sizes and were not included in the histograms.

## Results

### Electrofishing

Reach 1 contained 31 fishes among 6 different species. Brown Trout represented the majority of species captured (56%) in this reach, followed by Mottled Sculpin *Cottus bairdii* (22%). This site contained the only Coho Salmon *Oncorhynchus kisutch* sampled. Mean FL for Brown Trout in this reach was just under 7 inches with a range of almost 11 inches (Table 2). However, fish between 5 and 9 inches dominated the other size classes (Figure 2). Only Chinook Salmon *Oncorhynchus tshawytscha* parr were captured within this Reach (Table 2).

**Table 1. Fish Assemblage Data from Electrofishing Surveys at Reaches 1 through 3, Conducted in Kids Creek on August 20, 2019.**

Common Name	Scientific Name	Reach 1		Reach 2		Reach 3		Total	
		Count	CPUE (fish/min)	Count	CPUE (fish/min)	Count	CPUE (fish/min)	Count	CPUE (fish/min)
Brown Trout	<i>Salmo trutta</i>	18	-	63	1.07	45	2.88	126	-
Chinook Salmon	<i>Oncorhynchus tshawytscha</i>	3	-	11	0.19	6	0.38	20	-
Coho Salmon	<i>Oncorhynchus kisutch</i>	1	-					1	-
Mottled Sculpin	<i>Cottus bairdii</i>	7	-	74	1.26	7	0.45	88	-
Pumpkinseed	<i>Lepomis gibbosus</i>		-	1	0.02			1	-
Rainbow Trout	<i>Oncorhynchus mykiss</i>	2	-	10	0.17	5	0.32	17	-
White Sucker	<i>Catostomus commersonii</i>	1	-	10	0.17			11	-
	<b>Total Species</b>	<b>32</b>		<b>169</b>	<b>2.87</b>	<b>63</b>	<b>4.03</b>	<b>264</b>	
	<b>Richness</b>	<b>6</b>		<b>6</b>		<b>4</b>		<b>7</b>	

Sampling effort at Reach 2 lasted 59 minutes and yielded 287 fishes among 6 species (Table 1). Mottled Sculpin was the dominant species captured (44%) followed by Brown Trout (37%). Overall, the CPUE at Reach 2 was nearly 3 fish/minute. Reach 2 also contained the only Pumpkinseed sampled across the three reaches. Similar to Reach 1, Brown Trout sizes between 5 and 9 inches dominated the size classes captured (Figure 3). Mean FL for Brown Trout was approximately 6 inches, but a smaller range

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of sizes (8.6 inches). Similar to Reach 1, Chinook Salmon parr were captured but were the only age class captured (Table 2).

Reach 3 sampling yielded 63 fishes among only 4 species. However, this reach had the highest CPUE (4 fish/minute), suggesting fish abundance within this reach was higher than Reach 2. While CPUE for individual species was generally higher than Reach 2, Mottled Sculpin CPUE was lower in Reach 3 compared to Reach 2 (Table 1). Chinook Salmon were captured but parr were the only age class present within Reach 3 (similar to Reaches 1 and 2). Brown Trout and Rainbow Trout sizes were smaller than Reaches 1 and 2, with the majority of sizes between 3 and 8 inches (Figure 4). Reach 3 was the only site that did not contain White Sucker.

**Table 3. Length Data for Fishes Captured Within the Kids Creek Restoration Project Area. Fork Lengths were Recorded for Salmonids and Total Lengths were Recorded for all Non-Salmonids.**

Common Name	Reach 1		Reach 2		Reach 3		Total Mean FL/TL (inches)	Total SD (inches)
	Mean FL/TL (inches)	SD (inches)	Mean FL/TL (inches)	SD (inches)	Mean FL/TL (inches)	SD (inches)		
Brown Trout	6.8	2.8	6.3	1.8	5.3	2.8	6.0	2.4
Chinook Salmon	3.5	0.1	3.8	0.3	3.3	0.2	3.6	0.4
Coho Salmon	9.7*						9.7*	
Mottled Sculpin	2.6	0.2	2.8	0.8	2.6	0.6	2.8	0.7
Pumpkinseed			6.8*				6.8*	
Rainbow Trout	5.1	0.7	6.3	1.6	2.5	0.6	4.9	2.2
White Sucker	12.4*		7.6	1.0			8.0	1.7

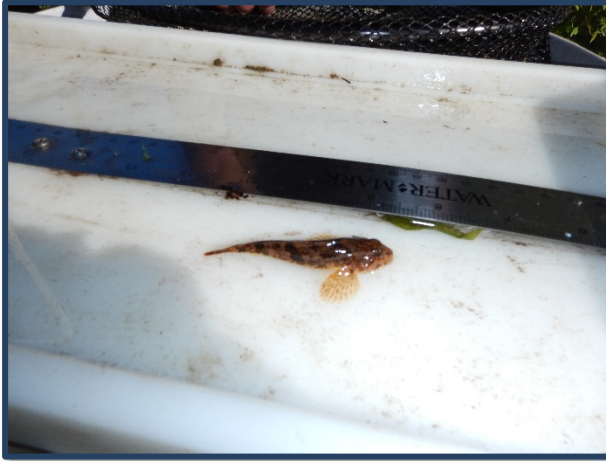
\*Single individual so no mean or SD calculated

## Conclusions

Kids Creek currently supports a cold-water fish assemblage dominated by mottled sculpin and Brown Trout. The presence of Chinook Salmon parr indicates this species uses Kids Creek for spawning habitat. However, the three road crossings (Figure 1) present within the project site may have a negative impact on upstream or downstream accessibility of the resident or anadromous species. Reach 3, a recently restored section of Kids Creek, contained the highest abundance of fishes, as measured by CPUE, but Brown and Rainbow Trout lengths were generally shorter compared to the two downstream reaches. This may indicate that larger fishes are not able to access areas upstream as effectively as smaller fishes. Additionally, White Sucker was not observed within in Reach 3, but was

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present in Reaches 1 and 2. White Sucker from Grand Traverse Bay may be using Kids Creek for spawning but cannot access Reach 3 or reaches further upstream due the swimming capabilities. Modification of the three road crossings within the project area will likely improve fish movement between the three reaches and Kids Creek and Grand Traverse Bay by creating more natural flow regimes and habitat conditions.



# Figures

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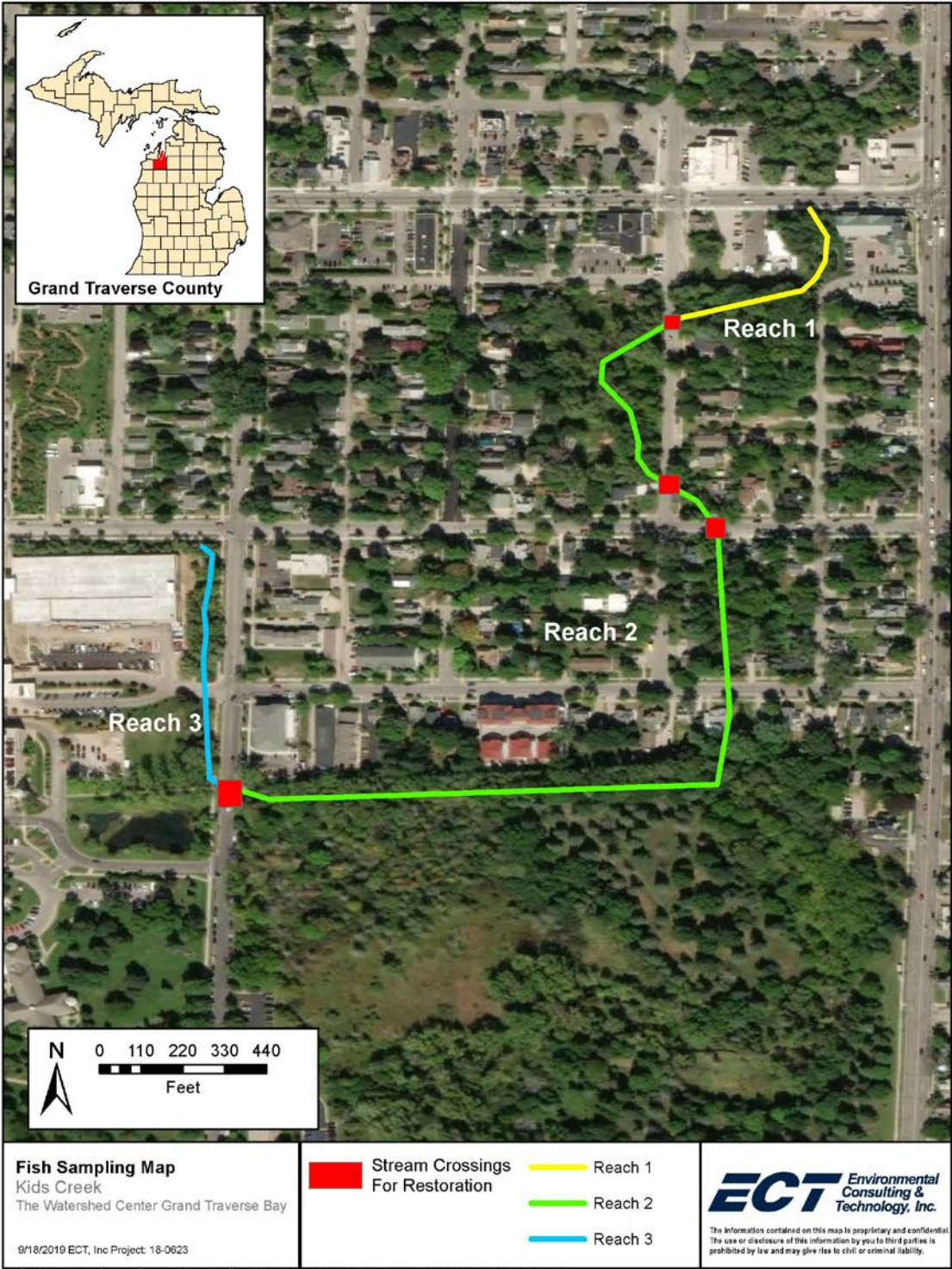


Figure 1. Site Map of the Kids Creek Fish Sampling Locations.

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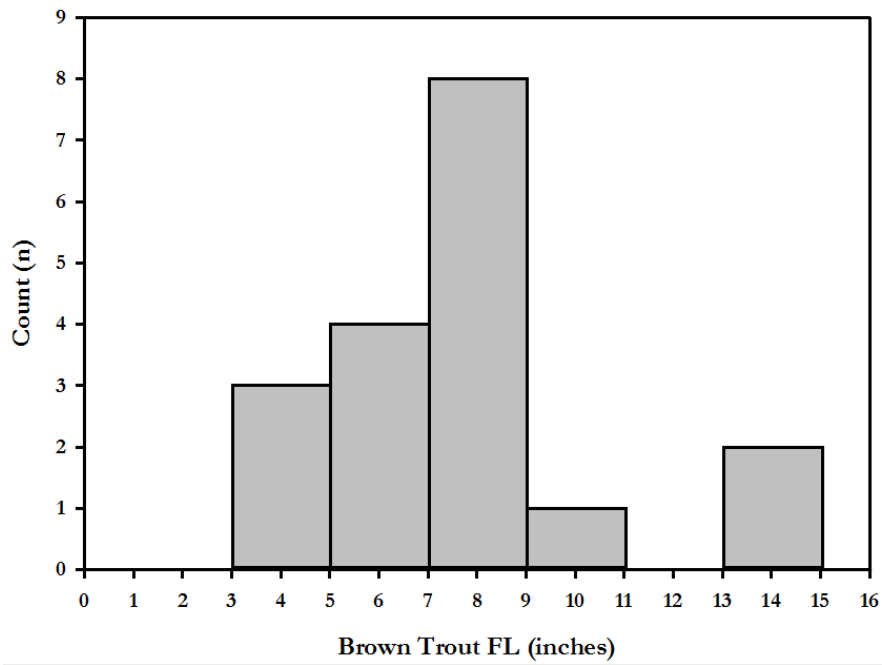


Figure 2. Size Class Histogram for Brown Trout Sampled in Reach 1

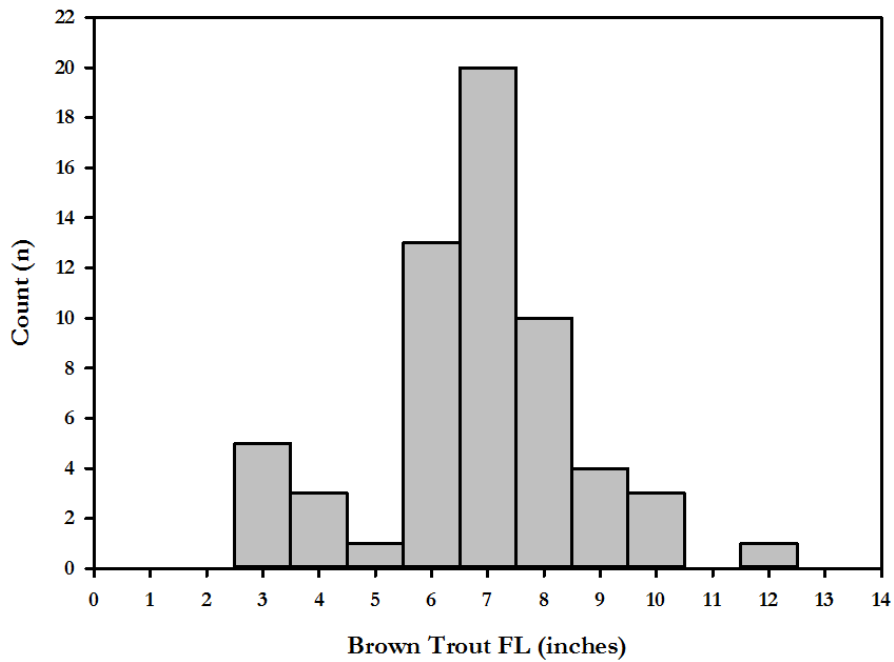


Figure 3. Size Class Histogram for Brown Trout Sampled in Reach 2

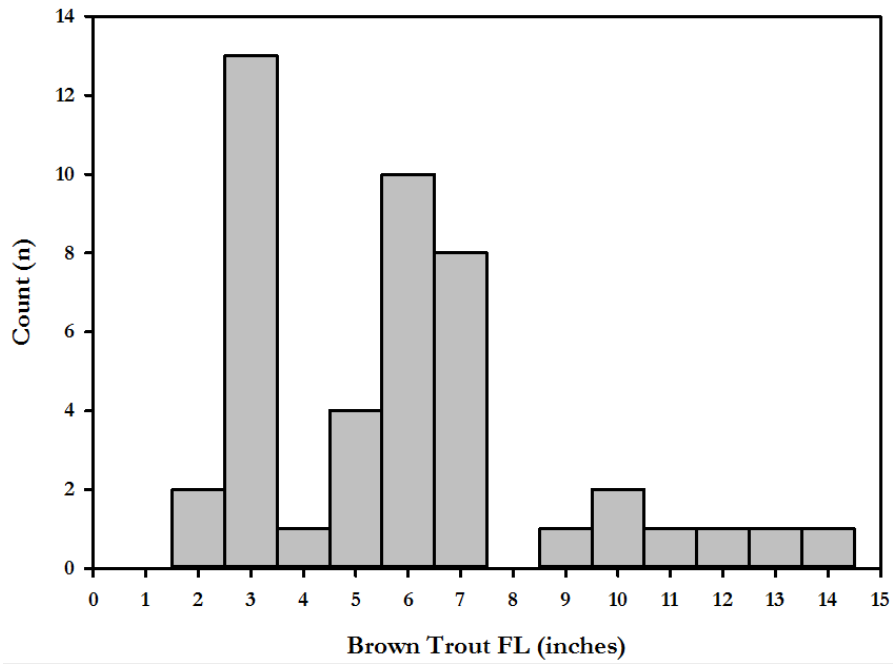


Figure 4. Size Class Histogram for Brown Trout Sampled in Reach 3