

ELECTROFISHING SURVEY OF MILL AND RATTLESNAKE CREEKS

BY

AQUATIC RESOURCE CONSULTING, INC

FOR

THE BRODHEAD WATERSHED ASSOCIATION

On 29 August 2019, Aquatic Resource Consulting (ARC) conducted an electrofishing survey of the fish community of Mill Creek. The objective of the investigation was to determine the relative abundance of fish species, in particular the status of the wild trout population. Mill Creek is currently classified as a High Quality Coldwater Fishery by the PA Department of Environmental Protection. However, the stream may qualify for the Exceptional Value rating based upon the water quality as measured by the aquatic macroinvertebrate and fish communities. Data from this survey will provide a database to establish stream quality.

BACKGROUND

Mill Creek originates on State Game Lands 2 miles west of Mountainhome, PA, in Monroe County before emptying into the Brodhead Creek approximately 4 miles downstream. The watershed is heavily forested and sparsely populated except at the intersection with State Routes 191 and 390 in Mountainhome. Stream gradient is relatively steep, dropping more than 1000 feet from source to mouth. Substrate is predominantly cobble, gravel and sand with little fine sediment deposition.

METHODS

The fish community was sampled using a backpack Smith-Root electrofishing unit with a handheld probe and nets. The stream area surveyed measured 300 feet in length and was located adjacent Sand Spring Road approximately ½ mile upstream from the Brodhead Creek. Stream width averaged 21 feet. Two consecutive runs were made to allow estimation of the total number and biomass of trout using a depletion removal formula. All trout collected were measured and weighed, then released. Other fish species were reported as abundant, common, or rare.

RESULTS

Fish Community

Five fish species were collected in Mill Creek. These are listed below in order of abundance, along with temperature classification (coldwater, coolwater, or warmwater), pollution tolerance, and trophic class (feeding habit).

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brown trout (*Salmo trutta*) – ABUNDANT, COLDWATER, INTOLERANT, TOP CARNIVORE. This species was imported from Germany and the British Isles in the mid-19th century and has become the dominant salmonid worldwide because of its adaptability to various habitats. It has supplanted native brook trout (*Salvelinus fontinalis*) in all but the coldest headwater streams in the Pocono region and elsewhere in Pennsylvania. Spawning requirements are relatively demanding – a silt-free, gravel substrate - because eggs are deposited and incubate for 3-4 months over winter.

slimy sculpin (*Cottus cognatus*) – ABUNDANT, COLDWATER, INTOLERANT, BENTHIC INVERTIVORE. A small reclusive fish, rarely exceeding 4 inches in length, that is an excellent indicator of cold, high quality freshwater ecosystems. Sculpins also cannot tolerate silty substrates because during spawning, they deposit their adhesive eggs on the bottom of cobble and boulders.

American eel (*Anguilla rostrata*) – COMMON, WARMWATER, TOLERANT, TOP CARNIVORE. A common inhabitant of both warm and cold stream systems on the Atlantic coast. This species spends the bulk of its life in freshwater but at maturity migrates to the Sargasso Sea near Bermuda to spawn. A voracious predator of small fish.

blacknose dace (*Rhinichthys atratulus*) – RARE, COOLWATER, TOLERANT, GENERALIST FEEDER. A small schooling fish in the minnow family that prefers pool areas with low stream velocity. It is extremely adaptable with probably the most widespread distribution of any fish species in the northeastern U.S.

longnose dace (*Rhinichthys cataractae*) – RARE, COOLWATER, MODERATELY TOLERANT, GENERALIST FEEDER. A somewhat larger species than blacknose dace that, unlike its close relative, prefers torrential flows.

Trout Population

A total of 112 wild brown trout were collected on the two consecutive collections on Mill Creek. Total estimated biomass in the stream area sampled was 92.1 kilograms/hectare. This value is more than double the PA Fish & Boat

Commission’s standard for Class A Wild Trout streams of 44 kilograms/hectare (40 pounds/acre).

The length-frequency distribution, a graph depicting the number of trout according to size, indicated that at least three and perhaps four age groups were present. Number of brown trout collected for each size group is shown in the following table.

<u>Run</u>	<u>LENGTH (mm)</u>				<u>Total</u>
	<u><120</u>	<u>120-200</u>	<u>210-270</u>	<u>>270</u>	
1	46	22	16	4	88
2	14	7	3	0	24
Total	60	29	19	4	112

Young-of-year (0+ years), those hatching in the spring of 2019, were the most numerous age class, representing 53% of the total trout collected. This confirmed excellent spawning success in the previous fall and survival since the hatch. These “fingerlings” averaged 80 mm (3.1 inches) in length. Yearling (1+ years) trout, those spawned in fall 2017, comprised 26% of the catch and ranged in size from 120 to 200 mm (5 to 7.5 inches). Finally, 23 larger and older mature brown trout, representing the 2+ and perhaps 3+ age classes, were netted – 21% of total trout in the collection. Twenty-six legal-size (>7 inches) trout were collected; eight of these were over 10 inches in length. The largest fish was 12.6 inches long and weighed 0,8 pounds.

SUMMARY

Mill Creek on the stream area sampled contained a naturally reproducing brown trout population with biomass far exceeding the PA Fish & Boat Commission’s standard of 44 kilograms/hectare for Class A Wild Trout waters. Brown trout and slimy sculpin, another fish species restricted to coldwater habitats and classified as pollution intolerant, predominated in the collections. Three other fish taxa – blacknose dace, longnose dace, and American eel – that are native to and commonly

found in streams in the Brodhead Creek drainage were also present but less abundant.

Numerous young-of-year trout confirmed excellent reproduction and first year survival of young fish. All age classes – fingerling (0+ years), yearling

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(1+ years), and older, sexually mature fish (2+ and 3+ years) - were well represented in the sample, indicative of a balanced, self-sustaining trout population. Based upon analysis of the length-frequency data, growth rate for wild brown trout in Mill Creek was similar to values that ARC has measured for trout in other headwater streams in the Pocono region.

Electrofishing Survey Of Mill Creek

Prepared for

**Brodhead Watershed
Association**

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