



Galien River 2011 Survey Report

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Introduction

The Galien River arises in Dayton Lake near the village of Galien and flows into Lake Michigan at New Buffalo. The Galien River watershed encompasses 112,222 acres, including 82,665 acres in Michigan and 29,557 acres in northern Indiana (Fishbeck, Thompson, Carr and Huber, Inc. 2003). Agriculture is the predominant land use in the watershed. Forests and wetlands compose approximately 22% and 2% of the watershed, respectively (Fishbeck, Thompson, Carr and Huber, Inc. 2003).

The predominant soils in the Galien River basin are silty loams of the Blount-Pewamo-Glynwood series (State Soil Geographic Database 1994). These soils are somewhat poorly drained, and Darcy maps indicate low potential for groundwater inflow throughout most of the river system. Portions of the watershed have been affected by dredging and channelization. In some areas, dredging and draining of wetlands has increased groundwater movement into the Galien River or tributary streams (e.g., Blue Jay Creek).

Gradient is moderate in the headwaters (upstream of Cleveland Avenue), averaging about 10 ft/mile. Downstream of Cleveland Avenue, the gradient generally is less than 5 ft/mile. The only dam on the mainstem Galien River is the water level control structure at Dayton Lake. The entire length of the mainstem and numerous miles of tributary streams are accessible to fish moving upstream from Lake Michigan.

The entire length of the Galien River is classified as a Type 4 trout stream, but only the portion of the mainstem upstream of the confluence with the East Branch Galien River is considered a designated trout stream. Brown trout, rainbow trout (steelhead), coho salmon, walleye, and lake trout have been stocked in the lower Galien River since 1979 (Table 1). The purpose of these stocking programs is to enhance the Lake Michigan fishery while providing seasonal fishing opportunities in the Galien River. Brown trout also are stocked in the South Branch Galien River and Spring Creek. Some of the brown trout stocked in these streams are resident fish that provide a summer trout fishery, while others move downstream into Lake Michigan.

Electrofishing surveys were conducted at various locations along the Galien River upstream of the confluence with the East Branch Galien River during 1969, 1973, 1976, and 1992. White suckers, creek chubs, and johnny darters were the most common fish species in the catch. Game fish were rare and primarily consisted of juvenile bluegills, green sunfish, pumpkinseeds, and largemouth bass. In 1992, one 10-inch brown trout was captured at Pardee Road and one 16-inch brown trout was collected at Holden Road. Burbot also were captured at multiple locations within the upper Galien River during 1969-1992.

Materials and Methods

As part of an effort to gather additional information on the relative abundance and distribution of fish species in the watershed prior to start of the Galien River Assessment, a backpack shocker (209 V DC, 64 Hz, 10% duty, 1.5-4.5 amps) was used to capture fish in the upper Galien River on October 12, 2011. The sampling station was 800 ft in length, and the Cleveland Road crossing was the upstream sampling limit.



A single electrofishing run was completed while moving in an upstream direction. Total length was recorded for all fish captured.

An Onset[®] StowAway XTI temperature logger was deployed in the Galien River near Cleveland Avenue on March 18, 2010. This device was programmed to record the water temperature every 72 minutes. The logger was retrieved on October 7, 2010.

Results

Twelve fish species were collected during the 2011 survey (Table 2). Green sunfish (n = 94) and creek chub (n = 78) were the most abundant species at this station. The maximum size for green sunfish was 4 inches. The only additional game fish in the sample were four bluegills (total length = 3-5 inches), one brown trout (total length = 11 inches), and one largemouth bass (total length = 3 inches). Two round gobies also were collected during the survey.

The temperature logger became damp and stopped recording on July 17, 2010. The mean water temperature for July 1-17 was 64.4 °F. The maximum water temperature recorded during this period was 66.7 °F.

Analysis and Discussion

The species composition of the fish community at Cleveland Avenue was similar to that observed during previous surveys on the upper Galien River. Game fish are scarce in this portion of the river. Most fishing activity probably occurs during the spring steelhead and sucker runs and the fall salmon and steelhead runs. No juvenile salmon, steelhead, or brown trout were captured during the 2011 survey. There appears to be minimal natural reproduction of these species in the upper Galien River. Suitable spawning habitat for salmonids is scarce in this system. Although patches of gravel are present, most of the gravel is embedded in sand. The adult brown trout captured at the Cleveland Avenue site likely was a hatchery fish that emigrated from one of the stocking sites on the lower mainstem.

The most noticeable difference between the historic and current fish communities is the presence of round goby. The round goby is native to the Black and Caspian seas and presumably was transported to the Great Lakes via ballast water. This species was first found in Lake Michigan in 1994 and has become abundant in many nearshore areas. During 2010-2011, round gobies were captured at multiple locations throughout the Galien River watershed. Gobies typically are found in areas with gravel or rocky substrate. As such substrates are rare in the upper Galien River round gobies are not expected to become abundant in this system.

According to the thermal classification system proposed by Lyons et al. (2009), this portion of the Galien River would be considered a cold transitional stream (mean July temperature between 63.5 °F and 67.1 °F). Cold transitional streams are expected to support fish communities consisting primarily of coldwater species (e.g., trout or sculpins) with lower abundance of warmwater fish species (e.g., creek chubs, sunfish, and darters). By contrast, the fish community in the upper Galien River is dominated by warmwater species. The discrepancy between the expected and observed fish communities is the result of two factors. As noted previously, gravel and cobble substrates are rare in the upper Galien River. These substrates are required for successful reproduction of trout and sculpins. In addition, summer water



temperatures throughout most of the Galien River are much warmer than those observed at the Cleveland Avenue station. Temperature monitoring during 2006-2007 indicated that mean July water temperatures at Warren Woods Road (approximately 4.3 miles downstream) were 3-4 °F higher than those recorded at Cleveland Avenue during the same period. Temperature loggers have not been deployed upstream of Cleveland Avenue. Because the Galien River begins as the outlet from Dayton Lake and surface water temperatures in southern Michigan lakes typically exceed 75 °F during July-August, it is likely that summer water temperatures in the uppermost reaches of the Galien River also exceed those recorded at Cleveland Avenue.

Management Recommendations

Multiple characteristics of the upper Galien River reduce its potential for providing year-round trout and salmon fishing opportunities. (1) Suitable spawning substrate (i.e., loose gravel) is scarce. Due to the surrounding soils and the low gradient of the stream, installation of spawning riffles likely would yield only short-term benefits. (2) Summer water temperatures throughout much of the upper Galien River are marginal for survival of trout and juvenile salmon. (3) Nearly the entire length of the stream is surrounded by private land, so public access to the stream is limited.

Due to these characteristics, the upper Galien River should be removed from the designated trout stream list in Fisheries Order 210. Under the existing regulations, spearing and bowfishing are prohibited in the Galien River upstream of the confluence with the East Branch Galien River. This restriction will cease when the stream is removed from the designated trout stream list, thus providing anglers with additional opportunities for harvesting white suckers and common carp. Stocking of steelhead, coho salmon, brown trout, and walleye will continue in the lower reaches of the Galien River. Spawning runs of adult trout and salmon will continue to support seasonal fisheries in the river, and the existing Type 4 trout stream regulations will remain in effect for the entire mainstem.

References

- Fishbeck, Thompson, Carr and Huber, Inc. 2003. Galien River watershed management plan. Prepared for the Berrien County Drain Commissioner by Fishbeck, Thompson, Carr, and Huber, Inc. Michigan Department of Environmental Quality Tracking Code 2000-0122.
- Lyons, J., T. Zorn, J. Stewart, P. Seelbach, K. Wehrly, and L. Wang. 2009. Defining and characterizing coolwater streams and their fish assemblages in Michigan and Wisconsin, USA. *North American Journal of Fisheries Management* 29:1130-1151.
- State Soil Geographic (STATSGO) database for Michigan (soils.shp). 1994. Produced by the United States Department of Agriculture, Natural Resources Conservation Service, Fort Worth, Texas. Supplied by the Digital Water Atlas Project and the Michigan Department of Natural Resources Fisheries Division, Institute for Fisheries Research, Ann Arbor.



Table 1.–Fish stocking in the Galien River, 1979-2011.

Year	Species	Site	Life Stage	Number	Average length (inches)
1979	Brown trout	New Buffalo	Fall fingerling	25,000	5.40
1981	Rainbow trout	New Buffalo	Yearling	10,000	3.68
1982	Rainbow trout	New Buffalo	Yearling	9,000	3.68
	Brown trout	New Buffalo	Fall fingerling	10,000	3.60
1983	Brown trout	New Buffalo	Yearling	10,000	6.64
	Rainbow trout	New Buffalo	Yearling	15,000	6.00
	Brown trout	New Buffalo	Fall fingerling	20,000	5.60
1984	Rainbow trout	New Buffalo	Yearling	15,000	7.76
	Brown trout	New Buffalo	Yearling	15,000	5.64
	Rainbow trout	New Buffalo	Fall fingerling	50,000	2.28
	Brown trout	New Buffalo	Fall fingerling	25,000	5.20
1985	Rainbow trout	New Buffalo	Yearling	7,800	7.52
	Rainbow trout	New Buffalo	Yearling	10,000	6.64
	Brown trout	New Buffalo	Yearling	13,030	6.24
	Rainbow trout	Glassman Road	Spring fingerling	60,000	1.8
1986	Brown trout	New Buffalo	Yearling	15,000	6.92
	Rainbow trout	New Buffalo	Yearling	9,400	6.44
	Rainbow trout	New Buffalo	Yearling	14,300	6.52
	Rainbow trout	New Buffalo	Yearling	700	6.64
	Walleye	New Buffalo	Spring fingerling	5,535	1.92
	Lake trout*	New Buffalo	Fall fingerling	54,600	5.24
1987	Rainbow trout	New Buffalo	Yearling	14,600	7.36
	Brown trout	New Buffalo	Yearling	15,000	5.92
	Rainbow trout	New Buffalo	Yearling	10,000	6.40
	Walleye	New Buffalo	Spring fingerling	3,000	2.36
1988	Rainbow trout	New Buffalo	Yearling	9,700	7.36
	Walleye	New Buffalo	Fry	319,000	0.36
	Brown trout	New Buffalo	Yearling	15,000	5.36
	Rainbow trout	New Buffalo	Yearling	10,000	6.52
	Walleye	New Buffalo	Spring fingerling	5,047	1.52
	Lake trout*	New Buffalo	Fall fingerling	79,450	4.84
	Brown trout	New Buffalo	Yearling	15,000	5.92
1989	Rainbow trout	New Buffalo	Yearling	9,900	6.40
	Coho salmon	New Buffalo	Yearling	25,024	4.92
	Rainbow trout	New Buffalo	Yearling	10,620	7.64
	Walleye	Glassman Road	Spring fingerling	4,990	1.76
	Rainbow trout	New Buffalo	Fall fingerling	25,000	2.40



Table 1.–Continued.

Year	Species	Site	Life Stage	Number	Average length (inches)
1989	Brown trout	New Buffalo	Fall fingerling	20,000	5.28
	Rainbow trout	New Buffalo	Fall fingerling	27,509	4.24
1990	Rainbow trout	New Buffalo	Yearling	10,000	6.68
	Brown trout	New Buffalo	Yearling	15,000	5.32
	Coho salmon	New Buffalo	Yearling	25,002	4.96
	Rainbow trout	New Buffalo	Yearling	15,000	7.00
	Rainbow trout	New Buffalo	Yearling	8,265	6.04
	Walleye	Glassman Road	Spring fingerling	7,225	2.12
1991	Brown trout	New Buffalo	Yearling	14,680	5.92
	Rainbow trout	New Buffalo	Yearling	9,198	7.12
	Coho salmon	New Buffalo	Yearling	25,000	4.64
	Rainbow trout	New Buffalo	Yearling	9,200	7.56
	Walleye	Glassman Road	Spring fingerling	5,000	2.04
1992	Brown trout	New Buffalo	Yearling	14,700	6.12
	Rainbow trout	New Buffalo	Yearling	9,995	6.84
	Rainbow trout	New Buffalo	Yearling	6,200	7.40
	Rainbow trout	New Buffalo	Yearling	6,200	7.44
	Walleye	Glassman Road	Spring fingerling	7,270	1.92
1993	Coho salmon	New Buffalo	Yearling	1,310	7.76
	Coho salmon	New Buffalo	Yearling	24,019	6.00
	Brown trout	New Buffalo	Yearling	14,899	6.00
	Rainbow trout	New Buffalo	Yearling	11,600	7.04
	Walleye	Glassman Road	Spring fingerling	7,337	1.40
1994	Rainbow trout	New Buffalo	Yearling	12,000	6.68
	Brown trout	New Buffalo	Yearling	2,239	8.76
	Rainbow trout	New Buffalo	Yearling	23,913	6.44
	Brown trout	New Buffalo	Yearling	12,751	6.80
	Walleye	Glassman Road	Spring fingerling	7,961	1.72
1995	Brown trout	New Buffalo	Yearling	13,996	6.12
	Rainbow trout	New Buffalo	Yearling	13,500	8.36
	Walleye	Glassman Road	Spring fingerling	7,216	1.56
1996	Rainbow trout	New Buffalo	Yearling	11,600	7.52
	Brown trout	New Buffalo	Yearling	18,300	6.16
	Rainbow trout	New Buffalo	Yearling	21,041	6.52
	Coho salmon	New Buffalo	Yearling	25,023	5.56
	Walleye	Glassman Road	Spring fingerling	11,332	1.60
1997	Coho salmon	New Buffalo	Yearling	25,010	5.44



Table 1.–Continued.

Year	Species	Site	Life Stage	Number	Average length (inches)
1997	Rainbow trout	New Buffalo	Yearling	12,500	7.60
	Brown trout	New Buffalo	Yearling	18,994	6.56
	Walleye	Glassman Road	Spring fingerling	10,015	1.24
1998	Rainbow trout	New Buffalo	Yearling	12,080	8.00
	Coho salmon	New Buffalo	Yearling	20,720	5.60
	Brown trout	New Buffalo	Yearling	18,500	5.64
	Walleye	Glassman Road	Spring fingerling	19,776	1.12
1999	Rainbow trout	New Buffalo	Yearling	12,140	7.36
	Brown trout	New Buffalo	Yearling	19,000	5.84
	Coho salmon	New Buffalo	Yearling	25,010	5.64
	Walleye	Glassman Road	Spring fingerling	47,719	1.04
2000	Coho salmon	New Buffalo	Yearling	27,512	5.56
	Rainbow trout	New Buffalo	Yearling	12,000	7.44
	Brown trout	New Buffalo	Yearling	24,588	5.48
	Rainbow trout	New Buffalo	Yearling	3,000	7.40
	Walleye	New Buffalo	Spring fingerling	7,877	1.08
2001	Coho salmon	New Buffalo	Yearling	25,252	5.36
	Brown trout	New Buffalo	Yearling	19,850	5.60
	Rainbow trout	New Buffalo	Yearling	12,023	7.92
	Walleye	New Buffalo	Spring fingerling	14,079	0.92
2002	Brown trout	Red Arrow Highway	Yearling	19,430	5.40
	Coho salmon	Red Arrow Highway	Yearling	24,241	6.00
	Rainbow trout	New Buffalo	Yearling	12,604	7.84
2003	Brown trout	Red Arrow Highway	Yearling	14,000	6.41
	Brown trout	Red Arrow Highway	Yearling	5,600	6.32
	Rainbow trout	New Buffalo	Yearling	14,940	7.53
	Coho salmon	Red Arrow Highway	Yearling	22,925	5.00
	Walleye	Red Arrow Highway	Spring fingerling	7,571	1.20
2004	Brown trout	Red Arrow Highway	Yearling	19,600	5.14
	Rainbow trout	New Buffalo	Yearling	13,400	7.40
	Walleye	New Buffalo	Spring fingerling	7,301	1.24
2005	Coho salmon	Red Arrow Highway	Yearling	20,610	5.52
	Rainbow trout	New Buffalo	Yearling	12,700	8.04
	Brown trout	Red Arrow Highway	Yearling	20,000	5.68
2006	Coho salmon	Red Arrow Highway	Yearling	25,001	5.60
	Brown trout	Red Arrow Highway	Yearling	19,950	5.50
	Rainbow trout	New Buffalo	Yearling	11,900	7.20



Table 1.–Continued.

Year	Species	Site	Life Stage	Number	Average length (inches)
2006	Rainbow trout	New Buffalo	Yearling	1,190	7.08
2007	Coho salmon	Red Arrow Highway	Yearling	25,000	5.92
	Rainbow trout	New Buffalo	Yearling	12,103	7.80
2008	Coho salmon	Red Arrow Highway	Yearling	25,000	5.84
	Rainbow trout	New Buffalo	Yearling	12,500	7.74
	Brown trout	Red Arrow Highway	Yearling	20,100	4.28
2009	Lake trout	New Buffalo	Yearling	20,000	5.44
	Brown trout	Red Arrow Highway	Yearling	25,000	4.66
	Rainbow trout	Red Arrow Highway	Yearling	14,624	7.24
	Walleye	New Buffalo	Spring fingerling	7,200	1.04
2010	Rainbow trout	Red Arrow Highway	Yearling	13,204	7.96
	Lake trout	New Buffalo	Yearling	22,000	5.00
	Coho salmon	Red Arrow Highway	Yearling	25,372	4.72
	Brown trout	Red Arrow Highway	Yearling	20,200	5.14
2011	Lake trout	New Buffalo	Yearling	20,000	5.36
	Coho salmon	Red Arrow Highway	Yearling	24,898	5.24
	Rainbow trout	Red Arrow Highway	Yearling	12,305	7.45
	Rainbow trout	Red Arrow Highway	Fall fingerling	100,317	3.08

* Federal plant



Table 2.—Numbers, calculated weights, and total length ranges for fish species captured in the Galien River near Cleveland Avenue during the electrofishing survey on October 12, 2011.

Species	Number	Percent by number	Calculated weight (lb)	Percent by weight	Total length range (inches)
Green sunfish	94	31.9	1.8	19.6	1-4
Creek chub	78	26.4	4.8	52.6	1-9
Blacknose dace	43	14.6	0.7	7.7	1-3
Johnny darter	41	13.9	0.2	1.9	1-2
Rainbow darter	10	3.4	0.0	0.4	1-2
Central mudminnow	8	2.7	0.0	0.4	1-3
White sucker	7	2.4	0.7	7.3	2-11
Blackside darter	6	2.0	0.1	1.0	3-3
Bluegill	4	1.4	0.3	2.9	3-5
Round goby	2	0.7	0.0	0.0	3-3
Brown trout	1	0.3	0.5	5.9	11
Largemouth bass	1	0.3	0.0	0.2	3
Total	295		9.1		