Michigan Department of Natural Resources
Status of the Fishery Resource Report 96-5, 1996.
Renumbered in 2024, Status of the Fishery Resource Report 0049

Dowagiac Creek

Cass County (T6S, R15W, Sec. 11 to T5S, R14W, Sec. 16)
Surveyed July 7, 9, 21, 1992

James L. Dexter, Jr.

Environment

Dowagiac Creek is a designated trout stream (second- quality, coldwater) located in north central Cass County. This first-order stream originates in a chain of lakes near Marcellus and flows in a southwesterly direction to its confluence with the Dowagiac River.

The watershed is predominantly agricultural. Gently rolling hills of sandy loam surround the area. Human development and activity is limited to a few homes along the creek, with plowed and fallow farmland, and some wood lots in between.

The amount of suitable trout water is estimated at 8.4 miles. The creek falls about 67 feet (8 ft/mile) from its source at Bunker Lake to Lake LaGrange (see map of Dowagiac Creek). Stream width is relatively constant at 25 to 30 feet, with an average depth of 1 foot. Holes deeper than 5 feet exist. Undercut banks, logs, overhanging brush and grasses, pools, riffles, and boulders provide a good array of available habitat. The amount of cover is rated as moderate to abundant. Sand and silt comprise about 25-40% of the stream bottom, with the remaining portion being gravel, cobble, and boulder.

Dowagiac Creek is extremely productive; 15 orders of aquatic invertebrates representing 42 separate species have been identified (Creal 1978). Mayflies, caddisflies, stoneflies, and dragonflies are all common to abundant. Methyl-orange alkalinity measurements range from 150-200 ppm. The pH averages 8.0. Dissolved oxygen levels have always been above 5 ppm when sampled. Water temperatures vary (57-76F), but average about 69F during summer. The water cools at least 6F from below Bunker Lake (Goodenough Road) to the end of the managed trout water near Lake LaGrange, as measured with continuous recording thermometers in 1994 and 1995. The upstream areas are too warm for trout survival, with up to a month of summer temperatures in the 75-80F range. Daily temperature fluctuations over the course of the entire stream are 3-13F. In the lower section of river (Kelsey Lake Road, map of Dowagiac Creek), stream temperatures during the summer of 1994 rose to 75F only twice, and usually never rose above 73F. This is due to the large infusion of groundwater into the stream which helps keep the lower river system quite cool.

There is no State-owned land along the creek, but it does flow through the Russ Forest, which is owned by Michigan State University. Anglers currently have no problems obtaining landowner permission to fish most of the creek.

Fishery Resource

Historically, Dowagiac Creek has been managed for trout since at least 1933. Brown, brook, and rainbow trout have all been planted; however, only browns have been stocked since 1964.

The creek has many faithful anglers, some who have been fishing there for decades. It is very good dry fly water, being sufficiently wide to permit fly casting by the novice. This feature is rare in many southern Michigan trout streams. Anglers do quite well, catching trout from 5-24 inches. Many limit catches are reported.

The first survey ever conducted on Dowagiac Creek appears to have been in 1959. Brown and rainbow trout were enumerated, "many" creek chubs and common shiners were noted, and a "few" mottled sculpins were reported. The next survey was not conducted until 1969, when no trout were collected and several species of cyprinids and centrarchids dominated the catch. This survey lead to the proposal for the first chemical reclamation in May 1971. This treatment, and the subsequent treatment in October 1980, achieved very favorable results and allowed for excellent trout angling. During both treatments, fair numbers were noted of naturally produced young-of-the-year brown trout in the lower section of the creek. An additional 10 surveys were conducted between 1970 and 1990, mostly as spot checks following reclamation.

In 1977, Fisheries Division constructed a rough fish barrier a short distance upstream of Lake LaGrange (the lower end of the designated trout water). This barrier (located on the old Bernard Hill property) has been very successful and has been instrumental in allowing a longer-than-usual period between chemical treatments.

Other than incursion of other species into the system, the only other management problem to date has been the potential failure of the dike at the Hill property where the barrier is located. This dike dates back to the 1800's, and was the site of at least two grist mills. One of the grist mill's cement foundations started to erode in November of 1993, and threatened to break the dike and render the fish barrier useless. Repairs were made during the same month by the St. Joseph River Valley Fly Fishers (SJRVFF), of South Bend, Indiana, at our direction. Repairs included installment of rock riprap and gravel to shore up the structure (pictures on file in district office).

Two habitat improvement projects have also been completed, both by the SJRVFF. In 1989, about 1 mile of the creek was improved for trout habitat in Newton Woods of Michigan State University's Russ Forest. Work included installation of 32 feet of lunker structures at the canoe launch near the parking lot, opening of channel-blocking log jams, and repositioning of this wood in the channel to benefit trout cover and scour holes (permit #89-12-0281). In 1990, another 64 feet of lunker structures were installed just above Griffis Road. No pre- or post-evaluation work was conducted.

In 1992, a fish survey was conducted at five sites (see map of Dowagiac Creek). It was one of the most intensive surveys ever made on the creek. Using a 250-volt DC shocker

unit with two probes, a total of 19 species of fish were collected (Table 1). Blacknose dace, central mudminnow, creek chub, and mottled sculpin were the most numerous species, accounting for over 57% of the total catch by number. Brown trout comprised 11.5% of the total catch by number. Brown trout were collected at each survey site. The catch-per-hour rate (CPE) for trout was 41/hour, with 17% of the catch being legal size (greater than 8 inches).

Naturally produced brown trout were found at stations 1, 2, 3, and 4. All browns collected at station 5 were determined to be of hatchery origin. Origin was judged from size (i.e., naturally produced young-of-the-year were 2-4") or fin characteristics. Hatchery browns are easily distinguished by eroded fins or regenerated crooked fins. We estimated that 32% of the brown trout catch was from natural reproduction. Growth rates of brown trout were good, with all fish sampled growing at state average rates (Table 2). Aging was also done on 6 of 8 largemouth bass collected. These were also growing at state average, indicating the stream is marginally warm for trout.

The age frequency sample of brown trout (Table 3) indicated good recruitment of age I+ fish, but a very high mortality rate following that. Based on this survey, there are few fish left to grow to a large size.

Some interesting changes occurred in the fish community between 1971 and 1992. Appendix 1 lists all species collected by number for every survey since 1971, including number of stations and hours electroshocked. To date, 32 species of fish have been identified in the system. Since the last chemical reclamation in 1980, potentially three species (northern hogsucker, golden shiner, and common stoneroller) have been extirpated. Pirate perch and madtom are now found in limited numbers, as only one individual of each has been collected since 1981. Brook silverside, greenside darter, and chestnut lamprey, all enumerated in the pretreatment survey of April 1971, were not found in recent surveys. Many of the species listed in Appendix 1, but not found in recent surveys, could infiltrate back in from the Bunker Lake watershed.

The fish community present in 1992 is actually little changed from the pre-reclamation period. The only significant difference from a management perspective (other than those species extirpated) is a decline in the number of rainbow darters seen, and an increase in the number of central mudminnows. These changes could be due to changes in electroshocking efficiency over time.

Since the 1980 reclamation, brown trout CPE fell from a high of 77/hour in 1981 to a low of 34/hour in 1990 (Appendix 1). A slight increase in CPE to 41/hour was seen in 1992. Since 1988, the percent contribution of brown trout to the fish community has been stable (Figure 2). However, the forage species appear to be on the increase.

Chubs and shiners generally seem to be the "enemy" when it comes to trout fishing. When the numbers of these fish become excessive, anglers complain because they usually catch more chubs and shiners that trout. I looked at the ratio of chubs to trout (Figure 3) and found that while numbers of these competitors were high prior to

treatments, that since 1988 the ratio has been fairly low and stable. An assumption here, however, is that effort expended to collect these species was similar in each survey.

Dowagiac Creek compares very favorably with other southwest Michigan trout streams. Unlike many of our marginal streams, about 1/3 of its trout population from natural reproduction. This is similar to Augusta Creek in Kalamazoo County, and the East Branch of the Paw Paw in Van Buren County. Few of our marginal streams have the variety and number of insects as Dowagiac Creek. These factors, plus the capability of the stream to produce very large brown trout, support the conclusion that the Dowagiac is one of the best trout streams in southwest Michigan.

Management Direction

Dowagiac Creek should continue to be managed as a marginal trout stream. At present, the stocking rate of brown trout is 243 yearlings per acre. Even though I am recommending that the Goodenough Road stocking site be deleted, I recommend these fish be used at the other stocking sites.

The current high angling use of the creek will require continued planting of trout. Natural reproduction is not enough to sustain the present level of fishing, especially with all the other species present. The majority of instream habitat is excellent, however, there are some areas which lack cover. These areas may be pursued in the future for improvement by the SJRVFF at our direction.

It is hard to tell at this point when the stream may need to be reclaimed. In 1988 I felt it was time for another treatment, but anglers were very negative to that proposal. They remain so today. Even though competing species appear numerous, all contacted anglers speak of the excellent overall trout fishing. At this point I am willing to let the anglers tell me when the stream needs reclaiming. Instead we will focus our management on closely defining the suitable trout water by conducting more temperature monitoring, and possibly, on designing more habitat improvement projects.

In 1988, I recommended the stocking rate be reduced by 53% due to the amount of natural reproduction. This management change has not hurt the fishery of the creek, and may have even helped to extend the period of no chemical reclamation by allowing the more vigorous naturally produced trout a better chance to survive.

Competing species have free access to the upper portion of Dowagiac Creek. The rough fish barrier in the lower end of the creek has served its purpose well by keeping other fish species out and allowing the effects of previous treatments to last many more years than usual. In addition, in 1995 the dam at Lake LaGrange was opened and the lake was drained to sill level. This will further enhance the effectiveness of the fish barrier. If the lake stays down into the future, additional river miles could become available for trout management.

Report completed February 1996.

Literature Cited:

Creal, W. 1978. A macroinvertebrate survey of Dowagiac Creek and Dowagiac River, Cass County, Michigan. August 18, 1977, Michigan Department of Natural Resources, Surface Water Quality Division, Lansing.

Table 1.- Number, weight, and length (inches) of fish collected from five sites on Dowagiac Creek with 250-V DC streamshocker, 2 probes, July 7, 9, and 21, 1992.

Species	Number	Percent by number	Length range (inches)[1]	Average Length	Percent Legal size[2]
Brown trout	147	11.5	2-13	6.7	17(8)
Creek chub	184	14.4	1-8	4.3	--
White sucker	97	7.6	1-15	7.4	--
Blacknose dace	215	16.9	1-4	3.3	--
Mottled sculpin	158	12.4	1-4	2.7	--
Grass pickerel	38	3.0	5-9	7.6	--
Mudminnow	173	13.6	1-4	2.6	--
Green sunfish	14	1.1	2-6	4.6	21(6)
Bluegill	7	.5	2-4	2.9	0(6)
Largemouth bass	8	.6	1-13	8.8	38(12)
Brook lamprey	2	.2	5-6	6	--
Lake chubsucker	20	1.6	2-5	3.8	--
Yellow bullhead	26	2.0	1-8	4	19(7)
Pumpkinseed	2	.2	3-4	4	0(6)
Johnny darter	60	4.7	1-2	2.3	--
Rock bass	47	3.7	2-9	4.7	0(6)
Common shiner	50	3.9	3-7	5.1	--
Bluntnose minnow	18	1.4	1-2	2.3	--
Hornyhead chub	8	0.7	4-6	5.4	--
Total	1274	100.0			

[1]Note some fish were measured to 0.1 inch, others to inch group: e.g., "5"=5.0 to 5.9 inch"12"=12.0 to 12.9 inches: etc.
[2]Percent legal size or acceptable size for angling. Legal size or acceptable size forangling is given in parentheses.

Table 2. - Average weighted total length (inches) at age, and growth relative to the state average, for fish sampled from Dowagiac Creek with 250-V DC streamshocker, 2 Probes, July 7, 9, & 21, 1992. Number of fish aged is given in parentheses.

	Age							Mean growth
Species	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**index[1]**
Brown trout	6.8	10.5	---	---	---	---	---	+1.0
	(21)	(2)	---	---	---	---	---	
Largemouth bass	5.1	7.5	---	11.2	12.7	13.7	---	--
	(2)	(1)	---	(1)	(1)	(1)	---	

[1]Mean growth index is the average deviation from the state average length at age

Table 3. - Estimated age frequency (percent) of fish caught from Dowagiac Creek with 250-V DC streamshocker, 2 probes, July 7, 9, & 21, 1992.

	Age							Number
Species	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**caught**
Brown trout	84	3	---	---	---	---	---	147
Largemouth bass	25	13	---	13	25	13	---	8

Appendix 1.-Dowagiac Creek fish surveys, 1971-92. Chemical reclamations in May 1971 and October 1980.

	Apr '71	Nov '72	Ju1 '73	Aug '75	Apr '76	Sep '78	Jul '80	Aug '81	Aug '88	Jul '90	Jul '92
					Number caught						
Brown trout	18	196	48	56	27	63	25	339	253	54	147
White sucker	177	95	124	70	80	91	130	l50	209	20	97
Lake chubsucker	21	1	4	1			10	5	9		20
Northern hogsucker		1			1	2	6				
Creek chub	401	48	30	29	106	60	69	67	410	101	184
Hornyhead chub	252	2			46	27	63		4		8
River chub									5		
Common shiner	555	72	26	9	92	31	57	53	118		50
Golden shiner	2										
Blacknose dace	175	50	7	15	80	91	23	1	307		215

Bluntnose minnow	2	1	3	1			3	3	119	3	18
Central stoneroller				4							
Brook silverside	1										
Bullhead	7	3	1	6	2		6	19	44	10	26
Madtom					2				1		
Grass pickerel	23	5		4	2	11	37	8	13	4	38
Northern pike						5	3		5		
Bluegill							1	3	8		7
Largemouth bass	1		3	4	1	5	19	41	12	10	8
Green sunfish	17	17	1	2			26	7	25		14
Pumpkinseed				1		1		1	1	8	2
Rockbass	31		11	11			16	1	30	1	47
Johnny darter	92	7	5	5	32	15	18	1	68	32	60
Rainbow darter	23	6	1	1	34	20	55		3		
Greenside darter	3										
Yellow perch	14					1			4		
Mottled sculpin	112	17	4	4	40	39	67	1	112	74	158
Central mudminnow	3	14	9	5		7	100	279	43	164	173
Pirate perch					1	1		1			
Bowfin	1			1				3			
Brook lamprey	24	5	3	1	1		5	30	14		2
Chestnut lamprey	2										
Total number	1957	540	280	230	547	470	739	1013	1817	481	1274
					Catch per hour						
Brown trout	2.5	49.6	20.5	19.7	14.4	37.7	7.3	77.2	69.1	33.8	40.5
White sucker	24.8	24.1	53.0	24.6	42.6	54.5	38.1	34.2	57.1	12.5	26.7
Lake chubsucker	2.9	0.3	1.7	0.4	0.0	0.0	2.9	1.1	2.5	0.0	5.5
Northern hogsucker	0.0	0.3	0.0	0.0	0.5	1.2	1.8	0.0	0.0	0.0	0.0
Creek chub	56.1	12.2	12.8	10.2	56.4	35.9	20.2	15.3	112.0	63.1	50.7
Hornyhead chub	35.2	0.5	0.0	0.0	24.5	16.2	18.5	0.0	1.1	0.0	2.2
River chub	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0
Common shiner	77.6	18.2	11.1	3.2	48.9	18.6	16.7	12.1	32.2	0.0	13.8
Golden shiner	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Blacknose dace	24.5	12.7	3.0	5.3	42.6	54.5	6.7	0.2	83.9	0.0	59.2
Bluntnose minnow	0.3	0.3	1.3	0.4	0.0	0.0	0.9	0.7	32.5	1.9	5.0
Central stoneroller	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brook silverside	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bullhead	1.0	0.8	0.4	2.1	1.1	0.0	1.8	4.3	12.0	6.3	7.2
Madtom	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.3	0.0	0.0
Grass pickerel	3.2	1.3	0.0	1.4	1.1	6.6	10.9	1.8	3.6	2.5	l0.5
Northern pike	0.0	0.0	0.0	0.0	0.0	3.0	0.9	0.0	1.4	0.0	0.0
Bluegill	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.7	2.2	0.0	1.9
Largemouth bass	0.1	0.0	1.3	1.4	0.5	3.0	5.6	9.3	3.3	6.3	2.2
Green sunfish	2.4	4.3	0.4	0.7	0.0	0.0	7.6	1.6	6.8	0.0	3.9

Pumpkinseed	0.0	0.0	0.0	0.4	0.0	0.6	0.0	0.2	0.3	5.0	0.6
Rockbass	4.3	0.0	4.7	3.9	0.0	0.0	4.7	0.2	8.2	0.6	12.9
Johnny darter	12.9	1.8	2.1	1.8	17.0	9.0	5.3	0.2	18.6	20.0	16.5
Rainbow darter	3.2	1.5	0.4	0.4	18.1	12.0	16.1	0.0	0.8	0.0	0.0
Greenside darter	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow perch	2.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	1.1	0.0	0.0
Mottled sculpin	15.7	4.3	1.7	1.4	21.3	23.4	19.6	0.2	30.6	46.3	43.5
Central mudminnow	0.4	3.5	3.8	1.8	0.0	4.2	29.3	63.6	11.7	102.5	47.7
Pirate perch	0.0	0.0	0.0	0.0	0.5	0.6	0.0	0.2	0.0	0.0	0.0
Bowfin	0.1	0.0	0.0	0.4	0.0	0.0	0.0	0.7	0.0	0.0	0.0
Brook lamprey	3.4	1.3	1.3	0.4	0.5	0.0	1.5	6.8	3.8	0.0	0.6
Chestnut lamprey	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
					Summary						
Number of stations	9	8	6	7	3	3	6	6	6	2	5
Hours electrofished	7.15	3.95	2.34	2.84	1.88	1.67	3.41	4.39	3.66	1.6	3.63
Number of species	24	17	16	20	17	17	21	20	24	12	19
Total fish	l957	540	280	230	547	470	739	1013	1817	481	1274
Brown trout	18	196	48	56	27	63	25	339	253	54	147
Forage[a]	411	95	29	35	189	173	266	286	653	273	624
Chubs/shiners[b]	1231	123	60	39	244	118	199	125	546	101	262
All competitors[c]	1528	249	203	139	331	234	448	388	911	154	503
Percent brown trout	1%	36%	17%	24%	5%	13%	3%	33%	14%	11%	12%
All other species	99%	64%	83%	76%	95%	87%	97%	67%	86%	89%	88%
Forage[a]	21%	18%	10%	15%	35%	37%	36%	28%	36%	57%	49%
Chubs/shiners[b]	63%	23%	21%	17%	45%	25%	27%	12%	30%	21%	21%
All competitors[c]	78%	46%	73%	60%	61%	50%	61%	38%	50%	32%	39%

[a]Forage fish includes: Blacknose dace, bluntnose minnow, central stoneroller, brook silverside, madtom, johnny darter, rainbow darter, greenside darter, mottled sculpin, central mudminnow, and pirate perch.
[b]Chubs/shiners include: Lake chubsucker, creek chub, hornyhead chub, river chub, and golden shiner.
[c]All trout competitors includes: Chubs/shiners and all other species except forage fish.

DOWAGIAC CREEK
Cass County (T6S, R15W, Section 11 to T5S, R14W, Section 16)

MANAGEMENT PLAN
based on
Status of the Fishery Report 96-5

James L. Dexter, Jr.

Our management goal for Dowagiac Creek will be to maintain the excellent trout fishing available now without having to resort to chemical reclamation. Three objectives will be necessary to help guide us toward this goal.

Temperature data collected from June of 1994 to May of 1995 at two locations on Dowagiac Creek (upstream and downstream) indicated that the uppermost stocking site at Goodenough Road is not suited to trout survival. Objective 1 is to delete this site from the stocking request and redistribute those fish to other downstream locations. Objective 2 is to obtain additional temperature monitoring units and further refine the area of "good" trout water. This will be done by installing units at the next site downstream of Goodenough (Marcellus Highway) and again at Kelsey Lake Road for comparison. Our goal is to complete this by the year 1999.

Objective 3 is to resample the 1992 survey sites. This should be done in 1998 and include a good effort to collect all fish for community composition and comparison. This survey, along with the new temperature data, will help us refine our management of stocked trout in the Dowagiac Creek.

Plan completed: February 1996.
Approved: Joan Duffy, District Biologist, April, 1996.

Last Update: 08/05/02
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Questions, comments and suggestions are always welcome! Send them to tinchert@michigan.gov