

CURTIS CREEK

St. Joseph County (T6S, R12W, Sec. 31 and T7S, R12W, Sec. 6, 7)

Cass County (T6S, R13W, Sec. 25, 26 and T7S, R13W, Sec. 1)

Surveyed August 10 & 11, 1993

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Environment

Curtis Creek is a second order stream located in western St. Joseph County. This top-quality designated trout stream flows south to Mill Creek, which feeds the St. Joseph River watershed of Lake Michigan. The town of Three Rivers is located about 4 miles to the southwest of Curtis Creek.

Most of Curtis Creek flows through nearly level to gently rolling, well-drained, loamy and sandy soils on outwash plains and moraines (Oshtemo-Spinks Association). The area surrounding the stream is primarily wooded, wetland, or abandoned farm field.

Estimated to be 3.3 miles long, Curtis Creek's west branch starts in low wetland areas dominated by springs. The east branch is an old designated drain (Profile Lake Drain) in the upper portion near M-60, but has hardly any water flowing through it. Curtis Creek falls about 50 feet from its headwater spring area to the confluence with Mill Creek. Stream gradient is about 15.2 feet per mile. It averages 14.5 feet in width, with an average depth of 1 foot. Stream discharge has never been measured, but is estimated at 10-15 cubic feet per second.

Available trout habitat is excellent, perhaps some of the best in southwest Michigan. The lower 1/3 of the creek flows through a huge grass wetland area with extremely stable banks because of dense root growth. Many of the banks are undercut by 2 or more feet and supply excellent cover for trout. The creek in this area meanders extensively, and each bend's associated pool is usually 3-4 feet deep. The upper areas of the creek do not meander as

much and have a little more sand and silt. On average, gravel accounts for 10% of the bottom substrate, sand 52%, and silt 38%. However, good spawning gravel predominates in some areas. Upstream areas also contain more woody debris. Watercress is common throughout the system.

Bottom substrate composition may have changed somewhat in the last 30 years. Compared to notes from a survey in 1970, gravel was apparently more abundant then than it is now. Local anglers also report that more sand is getting into the stream. The two main road crossings on the stream, New England Road and Corey Lake Road (sometimes referred to as Preston Road), definitely appear to be contributing sand via road runoff.

Water quality characteristics were measured on August 8, 1993. Afternoon dissolved oxygen levels were 7.4 ppm, pH was 8.1, and alkalinity was 191 ppm. These values indicate the water is hard and well buffered. Continuous recording thermometers deployed in 1996 showed that the creek has an excellent groundwater supply. The July minimum temperature was 50.0°F, and the maximum was 62.4°F. The maximum daily fluctuation was 5.5°F.

Almost 1/2 of Curtis Creek lies in the Three Rivers State Game Area. This presently is about the only area available to anglers, as property owners upstream of the game area do not allow angler access. Development in the watershed is limited to a few homes and farms.

Fishery Resource

Most likely Curtis Creek has been managed by the state as a trout stream since the turn of the century. Some historical records also call this water Wolf Creek. The first field survey of the stream was conducted in 1926. Brook trout, mottled sculpin, and central mudminnows were present. Although no records exist, brook trout must have been stocked by the state as this area is not in the brook trout's native geographic range.

Stocking records for Curtis Creek date back to 1932 when 500 rainbow trout were added. Brook trout were then stocked in 1933 and 1934, and again from 1942-1962. Records indicate that brown trout were stocked only once, in 1952. File letters from the 1940s indicate that brook trout angling was good at that time (even though stocking had been sporadic) and called for continued planting of brook trout.

During the 1940s, the quality of the creek for supporting trout was questioned. But because of the war effort, looking at the characteristics of the creek was not a high priority. It is interesting to note that state biologists took the word of a local angler who collected stream temperatures, and then continued stocking of brook trout. About this time the stream was designated as a trout stream from its source down to an impoundment (estimated size 15 acres) located at T7S, R12W, Sec 7 (SE 1/4 of NW 1/4). This impoundment had an 8-foot head and warmed the downstream waters considerably. It is not known when this dam was constructed, but it was for electrical generation.

In 1947 the dam washed out. The owners rebuilt the dam in 1948. Previously, in 1929, the state of Michigan had purchased large sections of land in the area to create the Three Rivers State Game Area. This land purchase included the dam in Section 7, but not the impoundment. In 1963, the First Trinity Missionary Baptist Church of Flint bought 83 acres of property which included the impoundment. Sometime between 1964 and 1968 the dam failed again. The church was denied permission to rebuild the dam because it was

located on state property and there was concern over loss of fisheries values if the dam was rebuilt.

In 1972, 1977, and 1993 the church sought once again to rebuild the breached dam. Finally, in 1993, Wildlife Division had the property resurveyed to convince the church that the dam was actually located on state land. At that time Wildlife Division removed the remnants of the dam.

Fisheries surveys were conducted in 1970 and 1973. Wild brown trout dominated the fishery, apparently established by stocking 20 years earlier. No brook were collected. Other species found during those surveys included creek chub, common shiner, mottled sculpin, blacknose dace, rainbow darter, and central mudminnow. After the 1970 survey the stream classification was changed to top-quality coldwater. The entire stream was now classified as a designated trout stream. Angling at this time was considered excellent for brown trout.

The most recent fishery survey was conducted on August 10 and 11, 1993. We conducted mark-and-recapture estimates for trout, and collected all other species present during the first run, using a 250-V DC streamshocking unit with two probes. The overall fish community found (Table 1) was similar to that in the 1970s.

Brown trout were the dominant game fish in the system. Brown trout were collected from 2-21 inches in length. Six age classes (0 to V+) of trout were present. Mean growth of brown trout was above the statewide average (Table 2). Age frequency analysis (Table 3) indicated very strong recruitment of age I fish, and fair survival of trout through age V. There appears to be considerable mortality after age I. This is most likely due to angler harvest.

Population estimates indicated that Curtis Creek held a very healthy population of brown trout (Table 4). The upstream sample site at New England Road held an estimated 102 pounds per acre, of which over 48% were of legal size. The downstream site, within the Three Rivers State Game Area (below Corey Lake Road) held over 69

pounds per acre, of which 41% were of legal size. All these values are very favorable compared to most other southern Michigan wild trout streams.

Combining the data from the two sample sites indicates that recruitment of young-of-year brown trout was low for the 1993 year class, at least compared to the 1992 year class (Figure 1). This could be due to sampling inefficiency, as collection of age 0 trout is never very good.

Other species collected during this survey that were abundant as trout included mottled sculpin, white sucker, and blacknose dace. Eight new species (not reported in previous surveys) were collected, but none were abundant (Table 1).

Curtis Creek is an excellent wild trout stream. It is perhaps one of the best in southern Michigan. In St. Joseph County there are only about four known streams capable of holding trout, so it is a rare resource.

Management Direction

Curtis Creek will continue to be managed as a top-quality designated trout stream. Stocking should not occur in this stream as long as the stream retains its present characteristics and its wild trout population. We will conduct another survey of the stream within the next 10 years.

Curtis Creek should continue to provide an excellent brown trout fishery well into the next century. Our management goal will be to maintain or improve this fishery through three options. These include removal of the sand bedload in the stream, work on the crossings at New England and Corey Lake (Preston) roads to stop erosion, and pursuing purchases of any land that may become available north of the Three Rivers State Game Area. Anglers have been denied access to the upper half of Curtis Creek for decades, and obtaining this land for angler access would significantly increase the amount of stream available for fishing.

Potential obstacles to attainment of our goal include lack of funding to do road work with the county, lack of funding for a sediment basin, and lack of funding to purchase any available land that comes on the market.

Report completed: January 20, 1997.

Table 1.--Number, weight, and length (inches) of fish collected from Curtis Creek with 250-V DC stream-shocker and two probes, August 10, 1993.

Species	Number	Percent by number	Length range (inches) ¹	Average length	Percent legal size
Brown trout	91	27.2	2-20	9.2	51(8)
Pumpkinseed	1	.3	4	4.5	0(6)
Green sunfish	4	1.2	3-4	4.3	0(6)
Bluegill	6	1.8	3-6	4.7	17(6)
Mottled sculpin	100	29.9	1-4	2.9	0
White sucker	73	21.9	3-17	8.1	0
Central mudminnow	9	2.7	2-5	3.4	0
Johnny darter	1	.3	2	2.5	0
Rainbow darter	2	.6	2	2.5	0
Creek chub	4	1.2	4-6	5.8	0
Bluntnose minnow	1	.3	5	5.5	0
Blacknose dace	32	9.6	2-4	3.3	0
Bullhead	3	.9	7-12	9.5	100(7)
Grass pickerel	3	.9	2-4	3.5	0
Lamprey ammocete	4	1.2	4-7	6.3	--
Total	334	100.0			

¹Note 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.

²Percent legal size or acceptable size for angling. Legal size or acceptable size for angling is given in parentheses.

Table 2.--Average total weighted length (inches) at age, and growth relative to the state average, for fish sampled from Curtis Creek with 250-V DC Streamshocker and two probes, August 10, 1993. Number of fish aged is given in parentheses.

Species	Age						Mean growth index ¹
	I	II	III	IV	V	VI	
Brown trout	7.6 (26)	11.4 (7)	12.8 (11)	18.3 (4)	17.7 (2)	---	+1.5

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 Curtis Creek with 250-V DC Streamshocker and two probes, August 10, 1993.

Species	Age						Number caught
	I	II	III	IV	V	VI	
Brown Trout	57	8	14	7	3	---	91

Table 4.--Mark and recapture population estimates of wild brown trout in Curtis Creek, August 10 and 11, 1993. Estimates were made using the modified Bailey formula.

Site	Area surveyed (acres)	Estimated pounds/acre	Percent legal size (>8.0")	Estimated total trout /acre	Estimated number /mile
New England Road	0.29	102.76	48.1	186	1,212
Corey Lake Road	0.34	69.54	41.4	249	1,138
Both sites combined	0.63	86.81	44.8	230	1,175