Michigan Department of Natural Resources
Status of the Fishery Resource Report 2000-4, 2000.

EAST BRANCH PAW PAW RIVER

Kalamazoo County (T3S, R12W, Section 31)
Van Buren County (T3S, R13W, Sections 17, 18, 20-22, 25-27, 36 and T3S, R14W, Section 13)

Surveyed August 14-16, 1995

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Environment

The East Branch of the Paw Paw River is one of many larger tributaries to the main stream of the Paw Paw River. A second-order designated trout stream with a water quality designation of top-quality cold, the East Branch flows in a westerly direction until it flows into Maple Lake in the Village of Paw Paw.

Most of the East Branch flows through nearly level, very poorly drained soils which have moderate water capacity and slow surface runoff. These soils fall into the categories of either Houghton muck or Glendora sandy loam. The surrounding area of the stream is mostly small wooded lots, fallow farmland, and new residential home sites. Land around the East Branch is becoming very popular for new homes.

Estimated to be 8.4 miles long, the East Branch has two main sources: Little Paw Paw Lake in Kalamazoo County and Mattawan Creek in the Village of Mattawan. This small creek starts in a swampy area just to the southeast of the Village. Both the creek and the East Branch pick up considerable amounts of ground water. Total fall for both of the streams is about 150 feet from the sources to the confluence at Maple Lake.

The East Branch ranges from 11 to 24 feet wide, averages 16.8 feet wide, and has an average depth of 1.3 feet. Discharge measurements made during various seasons in the 1960s showed that flows ranged from 2-8 cfs in the upper reaches to 15-30 cfs in the lower reaches before entering Maple Lake. Habitat is good, with overhanging brush, undercut banks, pools, riffles, and logs all being common throughout many sectors of the river. Gravel and rock occur throughout the river bottom, but average 36% and 5% of the available substrate, respectively. Sand predominates (47%), silt accounts for 10% of the substrate, and some traces of clay occur in the lower reaches. Comparing these estimates of bottom substrate composition to those estimated in a 1967 survey, it appears that up to ½ of the gravel substrate has been buried by an increase in sand bed load. No large sources of sand input are known to exist.

No land is owned by the State along the banks of the East Branch. Some bridge locations where access is possible are posted "No trespassing" but landowners allow access to anglers upon request. Two small dams exist in the middle reaches of the East

Branch and there is another dam at the lower end. Development in the watershed is mostly limited to residential home sites, and these are not excessive at this time.

Fishery Resource

The East Branch has been managed for trout since at least 1934 when brook trout were stocked. No trout stocking took place in 1965-1968 and 1970. For most years between 1939 and 1965, combinations of brook, brown, and rainbow trout were stocked. Since 1971, only brown trout have been stocked.

Anglers have been attracted to the East Branch for decades. Records from the 1950s indicate intense pressure. Trout as large as 20 inches have been captured during surveys, and anglers have reported brown trout as large as 27.5 inches (7 pounds, in 1985). Carryover of stocked trout has always been good, and natural reproduction has been evident since surveys began.

During a 1990 survey (Dexter 1991), brown trout were found at four of six lower locations on the East Branch. Seventy-nine percent of these trout were 8 inches or longer. They were judged to be mostly wild fish based on size (young-of-the-year at 2 to 3 inches) and fin characteristics. Hatchery browns are easily distinguished by eroded fins or regenerated crooked fins. Growth was very good, with age groups 1-3 growing well above the State average rate for this species.

No trout were found at the upper two stations that are strongly influenced by Little Paw Paw Lake. Water temperatures at these two sites are most likely too warm to support trout. A temperature survey needs to be conducted to verify that.

When comparing the results of the 1990 survey on the East Branch with past surveys (1962, 1966 and 1975), a very interesting history was revealed (Dexter 1991). Relative abundance of brown trout declined after each sampling period. Catch per hour of electrofishing was highest in 1962 (59.5), followed by 1966 (29.5) and 1975 (19.5), and was lowest in 1990 (13.7). What is interesting here is that no brown trout were stocked from 1958 through 1967, so the high numbers of brown trout collected in 1962 and 1966 all originated from natural reproduction. Legal-size browns were stocked at an average rate of 1,150 per year between 1947 and 1957. These were stocked in conjunction with an average of 2,300 legal-size brook trout and 800 legal-size rainbow trout. Surveys during the 1960s took only one 6-inch brook trout, no rainbow trout, and many brown trout. This may have been indicative of poor survival of brooks and rainbows in this environment.

Bachman (1982) found that when hatchery trout were stocked into a wild population, many agonistic encounters took place between the two. Most often, larger hatchery trout chased smaller wild trout out of their territories. When these hatchery trout encountered larger wild trout, they would not chase the wild trout out, but they did cause severe stress to the wild fish.

Based on this information, it seemed possible that the stocking schedule of the 1970s, 1980s and 1990s was reducing the potential to create a better wild trout fishery. A management plan was adopted to stop all stocking of trout for a 4-year period, 1992 - 1995 (Dexter 1991). The objective was to determine if the trout population could be maintained by natural reproduction. Results were to be evaluated by a spot check in 1993 and a population estimate in 1995.

The survey in 1993 was conducted at the three lowermost stations. The catch per hour of brown trout was 16.0, a 15% increase compared to the 1990 survey. Brown trout were collected from 3 to 18 inches in length, but the average size of trout collected was large, indicative of low recruitment. At the same time anglers were complaining about the lack of small trout (file data). In 1995, we surveyed six sites (repeat of 1990 effort), and conducted population estimates of trout at two sites.

The fish community found in 1995 was virtually unchanged from that of 35 years ago (Table 1). It is strikingly familiar to the 1990 survey. Brown trout remain the primary game fish. One brook trout was collected. A few warmwater species were present, but not in significant numbers.

However, trout caught per hour of electrofishing was down to 8.8, a 36% decrease from 1990 (the catch-per-hour computation is only based on stations where trout were caught). Mark and recapture population estimates (Bailey method) were conducted at 28th and 30th Avenues, the only sites that had enough trout. For this section of river, brown trout were present at an average of 22 pounds/acre, but only 38 fish per acre. The majority of the biomass was larger trout. Brown trout age groups 0-4 were identified. Growth rates were well above State average at +1.9 inches (Table 2). Age-frequency analysis appeared normal based on the small sample (Table 3).

Management Direction

Data collected from the 1995 survey showed that the East Branch of the Paw Paw River can sustain a wild fishery, but not at the level that anglers have come to expect. Just 2 years after stocking ceased anglers began noticing the lack of small fish, but not of larger fish. Given that four of the six sites have suitable habitat and water quality for trout survival, and we found most trout at only two stations, it would appear that limited successful natural reproduction produces an average for the entire river of about 10 pounds per acre of brown trout. This is very low for a productive stream in this area of the state.

Stocking efforts previous to 1992 were at levels approaching 200 spring yearlings per acre. Strain availability from the hatcheries was inconsistent. Our management direction in 1996 was directed at lowering stocking rates to supplemental levels (100 per acre), and obtaining consistent strains for stocking. Seeforellen strain brown trout have been used since 1996 and should be used through the year 2000. After that another new strain should be available if a change is needed. The Gilchrist Creek strain will be coming into full production and should be available about 2001. It is very wild in

character compared to the somewhat domesticated and lucustrine (i.e., lake-preferring) Seeforellen.

Our management goal into the next century should be to maintain and improve upon the existing fishery. We have received several comments since 1996 regarding the excellent fishing since low level stocking was started. Anglers appear very satisfied. However, a better management strategy would be to eliminate the need for stocking by enhancing reproduction. This stream used to produce more wild trout. Further investigation regarding sand bedload could be beneficial, but due to low staffing levels the cost of investigation would exceed the cost of continued low-level stocking.

Report completed May 15, 2000.

References

Dexter, J.L. Jr. 1991. East Branch of the Paw Paw River (and Mattawan Creek). Michigan Department of Natural Resources Status of the Fishery Resource Report 91-16, Ann Arbor.

Table 1: Species, relative abundance, and length of fish collected by stream electrofishing at six sites on the East Branch of the Paw Paw River, August 14 and 16, 1995.

Species	Number	Percent by number	Weight (pounds)	Percent by weight	Length range (inches)	Percent legal size
Blacknose dace	25	3.4	0.3	0.9	1-3	100
Bluegill	2	0.3	0.0	0.1	2-3	0
Bluntnose minnow	6	0.8	0.1	0.3	2-3	100
Brook trout	1	0.1	0.2	0.5	7-7	0
Brown trout	20	2.7	11.1	36.1	2-19	46
Bullhead catfishes (family)	2	0.3	0.0	0.0	6-8	100
Central mudminnow	11	1.5	0.1	0.3	1-4	100
Common shiner	66	9.1	1.5	4.9	2-6	100
Creek chub	177	24.3	3.6	11.6	1-7	100
Green sunfish	21	2.9	1.1	3.4	2-5	0
Horneyhead chub	77	10.6	1.7	5.5	1-5	100
Johnny darter	14	1.9	0.0	0.1	1-2	100
Lamphreys (Family)	1	0.1	0.0	0.0	5-5	100
Largemouth bass	5	0.7	0.1	0.4	1-5	0

Mottled sculpin	219	30.1	1.8	5.8	1-3	100
Northern brook lamprey	1	0.1	0.0	0.0	4-4	100
Northern hog sucker	2	0.3	0.2	0.8	3-8	100
Rainbow darter	21	2.9	0.1	0.4	1-2	100
Rock bass	4	0.5	0.3	0.9	2-6	17
White sucker	52	7.1	8.5	27.7	1-15	100
Yellow perch	1	0.1	0.0	0.1	4-4	0
Total	728					

Table 2: Average length (inches) by age group of brown trout from the East Branch of the Paw Paw River. The number aged is in parenthesis. More trout were aged than appear in Table 1 because unmarked brown trout from recapture runs were included in the age analysis.

Species	Age 0	1	2	3	4	Mean growth index
Brown trout	4.2 (10)	8.4 (6)	11.7 (8)	14.1 (4)	19.5 (1)	1.9

Table 3: Estimated age frequency (percent) of brown trout from the East Branch of the Paw Paw River, August 1995.

Species	Age 0	1	2	3	4	Number aged
Brown trout	34	21	28	14	3	29

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Questions, comments and suggestions are always welcome! Send them to tinchert@michigan.gov