Michigan Department of Natural Resources
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SAND CREEK

Allegan County (T3N, R14W, Sections 33-35)
and (T2N, R14W, Sections 1-5, 11)
Surveyed August 9, 12, 13, 1991

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Environment

Sand Creek is a very small, third-order tributary to the Kalamazoo River. It enters the Kalamazoo River where M-89 crosses the river, about 6 miles east of Fennville. The creek is a designated trout stream that is classified as top-quality cold water.

Almost all of Sand Creek flows through a forested watershed, and is almost entirely within the boundaries of the Allegan State Game Area. The underlying soils in this drainage are primarily Oakville Fine sands which are well-drained and have little storage capacity. The headwater tributaries, however, are mixtures of sandy loams and loamy sands which are poorly drained and have a higher storage capacity. The topography of the drainage varies from nearly level to rolling hills.

Sand Creek is estimated to be 6.2 miles long and to have 7 acres of water. It has several very small tributaries which may be intermittent in nature that were not included in the stream length estimate. Sand Creek falls 160 feet from its headwater tributaries to its confluence with the Kalamazoo River. The average stream discharge is approximately 5 cubic feet per second.

Sand Creek averages 9.2 feet in width and 3.5 inches in depth. The deepest pools are less than 3 feet deep. Aquatic habitat throughout much of the mainstream is fair to good. The second survey site (referred to as "Habitat Improvement Area" on Fish Collection forms) served as a MDNR Surface Water Quality Division GLEAS procedure 51 reference site. This site ranked high in habitat quality. Habitat components in the creek included logs, overhanging brush, and undercut banks (all common); boulders, rocks, pools (sparse except at site two); and riffles and pools (rare).

Bottom substrates in three surveyed sites averaged 7% boulders, 8% rock, 13% gravel, 5% clay, 61% sand, 4% silt, and 2% peat clumps. Areas of high velocity and fall had little embeddedness of gravel substrates. Peat occurred only at the uppermost survey site. The only water quality information on record was collected in 1947. During that survey dissolved oxygen ranged from 6.8 to 9.0 ppm and alkalinities from 136 to 144 ppm; pH was not measured. Recorded water temperatures during several summer surveys never exceeded 62°F.

Aquatic insects are plentiful in Sand Creek wherever suitable substrate or woody material exists. A total of 19 taxa were recorded in 1991, including a very high abundance of several caddis species, and a fair representation of mayflies and stoneflies.

Development within the watershed is extremely limited. Only a handful of houses are present, and none are on the banks of the stream. The watershed has second-growth hardwoods, a few fallow fields, and Christmas tree plantations. Access is excellent as all the fishable water occurs within the

boundaries of the Allegan State Game Area.

Fishery Resource

Sand Creek has been managed for trout since 1936, and perhaps earlier. Stocking records indicate that brook trout were stocked from 1936-1946, and in 1951. Rainbow trout were stocked in 1934 and 1944. Brown trout have never been stocked so far as is known.

The earliest survey on record was in 1925, when the watershed was still recovering from the effects of logging. Conifers were removed in the late 1800s, then a second logging effort removed hardwoods in the early 1900s. The 1925 survey noted that the surrounding county was "open with local brush" and gave a recommendation of "no good for trout". Species noted at that time included mottled sculpin, central mudminnow, blacknose dace, and horned dace (probably creek chub).

Fisheries surveys were also conducted in 1947, 1971, 1972, and 1978. Species composition through the 1970s included brook, rainbow and brown trout, coho salmon, mottled sculpin, and blacknose dace (all abundant). Non-abundant species included green sunfish, white sucker, brown bullhead, creek chub, central mudminnow, pumpkinseed, and burbot.

The fish community in 1991 differed little from that of 50 years ago. Mottled sculpin, blacknose dace, rainbow trout, creek chub, and brook trout were the most abundant species (Table 1). Two new species found in 1991 were johnny and blackside darters. They were probably present before but today's gear is more efficient for collecting them. Rainbow trout account for most of the fish biomass. Brown trout were not captured in 1991, although they were present in 1971 and 1978. The browns most likely migrated from Bear Creek (located just north of Sand Creek) via the Kalamazoo River.

Only three management problems have occurred at Sand Creek. A stream improvement program, designed to provide suitable spawning habitat, was proposed and 24 structures (of unknown type and location) were installed in 1950. No evidence of these structures was found in the 1991 survey.

In the summer of 1978, a flood caused by a 12-inch rainfall caused Sand Creek to "breach" a bend, eliminating approximately 300 feet of the best spawning area. A proposal to correct this breach was funded by Wildlife Unlimited of Allegan - Ottawa Counties in 1985, and the repairs were made in 1986. The stream repair withstood a 7-inch rainfall event in the fall of 1986. Now this section provides the best habitat on the entire stream, especially as a nursery area.

In 1988, a culvert replacement on the east M-89 crossing of Sand Creek was accompanied by some minor habitat improvement by the Michigan Department of Transportation. Using Fisheries Division's suggestions, several boulders, floating logs, and a small Wisconsin bank structure were installed immediately downstream of the culvert. Sand sediments (inherent in the basin) rendered the boulders and floating logs ineffective, and the Wisconsin structure was built too high. Low flows in this area (less than 2 cubic feet per second in summer) contributed to these failures.

The present trout fishery in Sand Creek is viewed as fair. Only resident brook trout reach legal size and are available to anglers. The rainbows smolt into steelhead and leave the creek while sublegals. Adult anadromous steelhead, coho, and chinook are present every year, but few are available to anglers because the fishing season is closed when most are present. Only those which run early or spawn late may be caught during the normal season. Poaching is troublesome for DNR Law Enforcement personnel because the creek is remote yet accessible.

The 1991 survey was conducted with DC backpack electrofishing gear at three sites. Population estimates were conducted at the lower two sites, but not at the upper site due to lack of trout.

Rainbow trout were captured from 1 to 11 inches in length. The combined population for both sites

averaged 622 trout and 16.6 pounds per acre. Estimates by age group indicated the stream produced about 430 yearling rainbows in 1991. Recruitment of young-of-the-year rainbows (1 to 4 inches long, Figure 1) was excellent. I believe the low number of yearling and older rainbows is indicative of the lack of deep-water habitat necessary to support older and larger fish.

Brook trout 2 to 9 inches long were captured at the lowest two sites. The estimated average population of brook trout (calculated using the Baily modification of the Peterson formula) was 86 fish per acre (6.1 pounds per acre). Recruitment of young-of-the-year brook trout appeared poor (Figure 2). Estimates by age group indicated a total brook trout population of only 300 fish.

Table 2 compares the catch-per-hour statistics of three trout species from four survey years. These data indicate that brook trout numbers may be decreasing due to competition from rainbow trout and salmon. Spawning areas are very limited in Sand Creek, and the large anadromous species may be superimposing their redds on brook trout redds. In 1991 it appeared that only a remnant brook trout population remained.

The growth rate of brook and rainbow trout in Sand Creek is very good (Table 3). Brook and rainbow trout were growing well above the State average rates. All trout species captured in this survey were very healthy and fat. Length of age-0 brook and rainbow trout is likely not really as big as stated in Table 3 because scale samples were taken only from trout 4 inches and larger. The estimated age frequency of brook and rainbow trout in table 4 does not include age-0. Mortalities between age I and II for both species appear higher than normal, probably due to the lack of deeper water needed by larger fish.

Few streams in southwest Michigan can compare with Sand Creek. It supports brook, brown, and rainbow trout, plus chinook and coho salmon. Its small size precludes it from becoming a major fishery attraction, but its scenic location invites brook trout anglers back each year.

Management Direction

Little management activity is needed at Sand Creek. An approved prescription is on file to repair some erosion damage (loss of rock on berm wall) at the 1986 improvement site. This work should be completed in 1993 or 1994; it involves only a few yards of rock. No stocking of the stream is recommended. Brook trout will most likely remain a minor species due to the large impact of spawning anadromous species, but I don't believe they will disappear even though recruitment was poor in 1991.

Our management goal into the next century should be to maintain the existing fishery at its present level or improve it if possible. There may be an opportunity to construct a barrier to keep anadromous species out of the good spawning areas, but this would also concentrate them more and attract more poaching activity. District 12 staff would prefer to wait and see if a proposed blocking weir at Brandywine Creek in Berrien County is effective at keeping the anadromous fish out. If so, the cost of building a weir on Sand Creek will have to be evaluated against the potential benefit to the fishery. At this time I would say a weir would not be cost effective. The stream just doesn't seem to have enough deep-water pool habitat to produce a larger population of adult brook trout. Little opportunity exists to create this habitat because of the sandy substrates.

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Table 1.-Species, relative abundance, and length of fish collected by DC backpack shocker at three stations on Sand Creek, August 9 and 12, 1991. Weight is estimated for trout only.

						Length range

Species	Number	Percent by number	Weight (pounds)	Percent by weight	(inches)[1]
Mottled sculpin	352	37.1			1-4
Blacknose dace	250	26.3			1-3
Rainbow trout	163	17.2	6.31	68.3	1-11
Creel chub	67	7.1			1-5
Brook trout	35	3.7	2.93	31.7	2-11
Central mudminnow	30	3.2			2
White sucker	14	1.5			1-7
Green sunfish	13	1.4			1-4
Coho salmon	12	1.3			3-4
Lamprey ammocete	7	0.7			5-7
Johnny darter	4	0.4			2
Blackside darter	1	0.1			3
Total	948	100.0	9.24	100.0	

1Fish were measured to inch group: e.g., "1"= 1.0 to 1.9 inches; "2" = 2.0 to 2.9 inches, etc.

Table 2.-Catch per hour of brook, brown and rainbow trout using electrofishing gear from four sampling years (all sites combined) on Sand Creek, Allegan County.

Year	Brook trout	Rainbow trout	Brown trout
1971	27.0	21.0	1.5
1972	40.0	---	---
1978	37.0	46.0	0.8
1991	7.4	57.0	---

Table 3.-Average total unweighted length (inches) at age, and growth relative to the state average, for fish sampled from Sand Creek with backpack electroshocker August 9, 1991 to August 12, 1991. Number of fish aged is given in parentheses.

	Age					Mean growth
Species	0	I	II	III	IV	index[1]
Brook trout	4.0	7.2	9.4	11.3	---	+1.5
	(1)	(9)	(1)	(1)	---	
Rainbow trout	4.3	7.1	11.6	---	---	+1.4
	(3)	(10)	(1)	---	---	

1Mean growth index is the average deviation from the state average length.

Table 4.-Estimated age frequency (percent) of fish caught from Sand Creek with backpack electrofishing gear August 9, 1991 to August 12, 1991

			Age			Number
Species	0+	I	II	III	IV	caught
Brook trout	41	53	3	3	---	35
Rainbow trout	68	31	1	---	---	163

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