Michigan Department of Natural Resources
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LOVE CREEK

Berrien County (T6S, R17W, Sections 9, 16, 17, 7)
Surveyed August 23, 1989 and July 11, 1990

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Environment

Love Creek is a very small first-order tributary to the St. Joseph River. A designated trout stream that has a water quality designation of top-quality cold, Love Creek enters the St. Joseph River downstream of Berrien Springs. The town of Berrien Springs is only about two miles from the middle section of the creek.

The upper half of Love Creek flows through a very steep wooded gully. There, glacial outwash soils are composed mainly of clay and sand (termed udorthents and udipsamments) and have a very rapid rate of surface runoff. The lower half of the stream is in nearly level soils composed of Houghton muck, which have a much lower rate of surface runoff.

Estimated to be 3.1 miles long, Love Creek has its source in a swamp area, and falls more than 130 feet to its confluence. Only the lower mile of stream is stocked by the DNR because the upper half is intermittent. In the lower area, the stream averages 5 feet wide and 6 inches deep. Habitat components include riffles, pools, undercut banks, grasses, shrubs, and overhanging brush. These are rated as common to abundant throughout the system.

Bottom substrates in the surveyed area (Deans Hill Road) consisted of 90% sand, 10% gravel, and a trace of silt. Water quality information (Creal 1989) revealed typical concentrations of heavy metals and nutrients for Michigan streams. This biological survey was conducted to assess impacts of the now closed Tri-Township Landfill (open dump). Water chemistry data did not reveal any contamination from the landfill, although some DNR Waste Management officials believe that contamination will eventually occur because the dump exists in sand and has no clay liner.

Nine taxa of benthic macroinvertebrates were recorded in the Deans Hill Road area in 1989. Only scuds (Amphipoda) were abundant. Snails, mayflies, aquatic beetles, and midges were all rated as scarce due to bottom habitat constraints. While aquatic organisms are deemed sparse, salmonids found in Love Creek are consistently fat and in excellent condition. These were some of the healthiest trout we have ever encountered.

Relatively little development has occurred in Love Creek's watershed. The lower half is bordered by some active hay fields and woods. The upper half is mostly wooded with an occasional residential site, and there is a small hospital near the creek. No State-owned lands occur along the creek, but the Love Creek Nature Center owns a substantial amount of frontage. Landowners allow access if permission is requested.

Fishery Resource

Love Creek has been managed for trout since at least 1933. Brook trout were stocked in 1933-

1938, and 1979 through the present. While not a large stream, it does have its faithful anglers who spend time in pursuit of brook and brown trout.

The earliest fish survey on file for Love Creek was conducted in 1969. This survey (and all others afterwards) used a backpack electroshocker. At this time, an excellent brown trout population was found (CPE 71/hr.). In addition to brown trout, a few creek chubs, green sunfish, central mudminnows, and white suckers were found.

The fish community of today is not much different from that in the 1969 survey (Tables 1 and 2). As most surveys on Love Creek have shown, reproduction of several salmonid species is good (in 1989 and 1990, rainbow trout), and while other salmonids may exist, their numbers may not be very high. Central mudminnows have always been numerous, but most other species have been sparse. Species found in addition to those listed in Tables 1 and 2, or mentioned above, include burbot, pumpkinseed, fathead minnow, blacknose dace, coho salmon, and golden shiner. Many of these were represented by only one or two specimens.

During the regular trout fishing season, four species of salmonids are available to anglers including brook, brown and rainbow trout, and chinook salmon. Steelhead spawn very successfully in Love Creek, and their offspring always make up a significant portion of the stream's fish biomass. In spring especially, and now sometimes in late summer, steelhead run Love Creek and provide some angling opportunity, although mostly they are targets for poachers.

Many of the rainbows in Love Creek do not smolt until a large size (7-10"), and remain in the stream and provide angling opportunities. Brown trout reproduce successfully (they have never been stocked) but this population appears limited. Coho salmon spawn successfully, but do not provide any angling opportunities because adults run late (October usually), and young smolt at a small size (less than 8"). Chinook salmon probably spawn successfully, but we have never surveyed Love Creek prior to their smolting date (May). Brook trout do not appear to reproduce, but are present due to stocking efforts.

The combined population of salmonid species is intrinsically linked to the sediment bedload in Love Creek at any given time. Figure 1 presents information that shows significant decreases in salmonid catch per unit effort after flood events that substantially increase sand bedload. The geological makeup of the moraine is such that any flood event erodes banks and deposits significant amounts of sand in the lower portions of the creek. Eventually, the high average velocity of the water uncovers buried gravels. There is nothing that can be done to stop this.

Catch per unit effort for each of the salmonid species present in Love Creek has been extremely variable since 1969 (Table 3). Some general conclusions can be drawn from this data. Brown trout abundance appears to have been severely reduced since anadromous runs of salmon and steelhead started. Brook trout abundance (and fishing success) were high in the initial years of the stocking program, but have since declined substantially. Several brook trout in the 15-20" range were reported by local anglers in the early stocking years. Rainbow trout (steelhead) are holding their own, while coho reproduction may resume in 1991 due to renewed stocking of coho in the St. Joseph River.

Research studies in recent years have implied anadromous salmonids compete with resident salmonids (Fausch 1981, 1986; Zeigler 1988). Anadromous runs up the St. Joseph River and into Love Creek appear to be inhibiting the brook and brown trout fishery. Seelbach (1991) has found through a continuing creel census of the St. Joseph River fishery that an insignificant percentage (less than 5%) of the steelhead caught are wild fish. This information has to be considered in the management of Love Creek.

Many small tributaries to the St. Joseph River in Berrien County are similar to Love Creek in both water quality and species composition. However, it has been known to produce more good fishing

than most local tributaries of similar size. Love Creek has a reputation for good fishing, and continues to provide this, although in a diminished capacity to that of even 10 years ago.

Management Direction

Love Creek should continue to be managed as a top-quality coldwater designated trout stream. Natural reproduction of at least three salmonid species is present. Brook trout do not reproduce successfully. Continued stocking of 800 brook trout/year will help maintain the brook trout fishery anglers have come to expect. The old stocking rate was 1,100 brook trout, but this has been decreased to 800 because we believe the creek is at carrying capacity.

I feel that the seasonal salmonid species have significantly reduced both brook and brown trout populations. We should investigate the feasibility of installing a blocking weir or lowhead dam to keep these salmonids out of Love Creek. However, the small size of Love Creek and limited angling opportunities dictate that a blocking device be inexpensive. Another positive aspect of a weir is that it would concentrate anadromous runs in one area and allow Conservation Officers to police the area for poachers more easily. I feel that the value of a good resident trout fishery in Love Creek would exceed the potential value of relatively small numbers of wild steelhead smolts to the Lake Michigan-St. Joseph River fishery.

Another obstacle to maintaining or improving the present fishery is the continued sand input after heavy rains. As sand is an inherent material in the moraine, there is nothing that we can do to stop this input. However, surveys show that the system recovers quickly. A survey should be conducted in 1996 similar to those conducted in 1980 and 1981. This will allow for a full evaluation of the entire system.

Report completed: October 1991.

References

Creal, 1989. A biological survey of Love Creek in the vicinity of Tri-Township Landfill, Berrien County, Michigan, September 20, 1988. Surface Water Quality Division Report MI/DNR/SWQ-89/036.

Fausch, K.D. 1981. Competition among juveniles of coho salmon, brook trout, and brown trout for resources in streams. Ph.D. dissertation. Michigan State University, East Lansing, MI.

Fausch, K.D. 1986. Competition among juveniles of coho salmon, brook trout, and brown trout in a laboratory stream, and implications for Great Lakes tributaries. Transactions of the American Fisheries Society, 115:363-381.

Seelbach, P. 1991. Survival and contribution of hatchery steelhead stocked in large warmwater rivers in Southern Michigan. Michigan Department of Natural Resources, Fisheries Division's Annual Dingell-Johnson Report for Project No: F-35-R-16, Study 622.

Zeigler, R.L. 1988. Stream resource utilization of sympatric and allopatric juvenile brown trout (*Salmo trutta*) and steelhead trout (*Salmo gairdneri*). Michigan Department of Natural Resources, Fisheries Research Report No. 1957. Ann Arbor.

Table 1.-Species, relative abundance, and length of fish collected by electrofishing at one station (375') on Love Creek, August, 1989.

Species	Number	Percent	Length range (inches)

Central mudminnow	36	45.0	1-3
Brown trout	22	27.5	1-4
Rainbow trout	18	22.5	1-10
Green sunfish	3	3.7	1-2
Brook trout	1	1.3	8
Total	80	100.0	

Table 2.-Species, relative abundance, and length of fish collected by electrofishing at one station (870') on Love Creek, July, 1990.

Species	Number	Percent	Length range (inches)
Central mudminnow	189	67.5	1-3
Rainbow trout	58	20.7	1-8
Green sunfish	29	10.3	1-5
Brook trout	2	0.7	6-8
Brown trout	1	0.4	9
Bullhead sp.	1	0.4	2
Total	280	100.0	

Table 3.-Catch per hour, using backpack electrofishing gear, of four species of salmonids from the Deans Hill Road Station at Love Creek, 1969-1990. N/P = Not present because not shocked.

Year	Brown trout	Brook trout	Rainbow trout	Coho salmon
1969	72.0	N/P	0	N/P
1971	42.0	N/P	110.0	28.0
1972	20.0	N/P	26.0	0
1978	0	N/P	0	4.0
1980	1.1	20.9	37.4	1.0
1981	0	5.5	39.6	58.0
1987	0	0	38.2	N/P
1989	16.9	0.8	13.8	N/P
1990	1.0	2.0	58.0	N/P

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

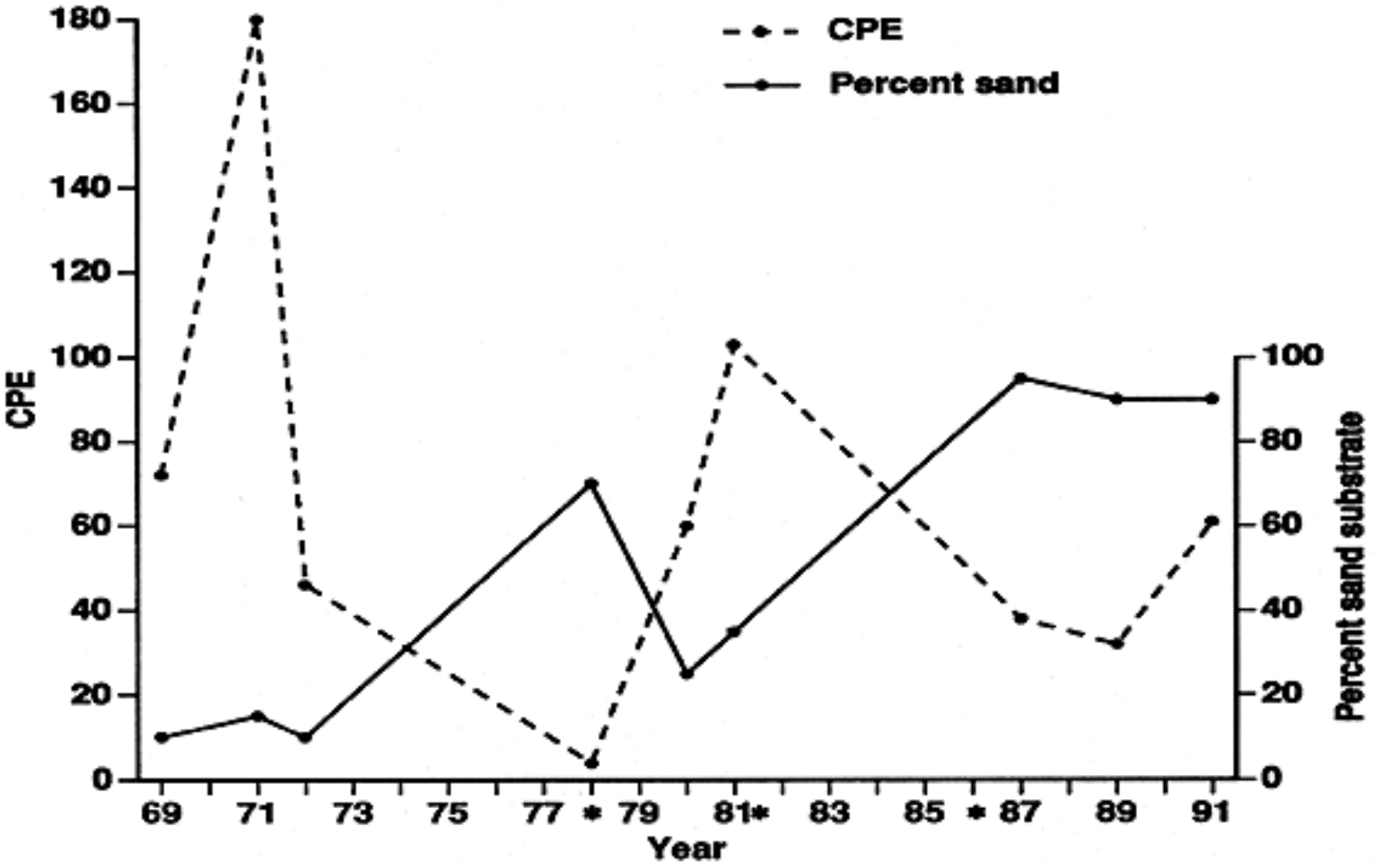

Figure 1.—Relationship between percent sand substrate below Deans Hill Road and CPE (catch per hour of electrofishing) of all salmonids in Love Creek, 1969-1990. (*) Denotes year of flood event.