Michigan Department of Natural Resources
Status of the Fishery Resource Report 93-1, 1993.
Renumbered in 2024, Status of the Fishery Resource Report 0031

HIGHBANKS CREEK

Barry County (T3N, R7W, Sections 30, 31) and
(T2N, R7W, Sections 6, 7), (T2N, R8W, Sections 12, 13, 24-26,35)
(T1N, R8W, Sections 2,3) Surveyed September 6 and 10, 1991

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Environment

Highbanks Creek, located in east-central Barry County, is a large second-order tributary to the Thornapple River (Figure 1). It is designated as top-quality coldwater for the lower two-thirds of the creek, and as top-quality warmwater for the upper one-third. The creek empties directly into Thornapple Lake, a natural lake in the Thornapple River system. The trout water area lies 4 miles due west of the town of Nashville.

Highbanks Creek flows through a mosaic of land uses. Much of the designated trout stream portion is forested, but interspersed are fallow farm fields and horse farms. The upper warmwater area contains significantly more active farms, more horse farms, and less forests. The underlying soils of the creek are primarily of the Marlette-Oshtemo Association, which are moderately sloping to steep, well-drained loamy soils. The topography of the area is slightly rolling to very rolling hills, some being very steep.

The designated trout water is estimated to be 9.2 miles in length. The warmwater portion of Highbanks Creek is another 6 miles in length. The source of Highbanks Creek is Bristol Lake in Barry County. The first 6 miles of creek are relatively straight with little meandering. Only a few small first-order tributaries feed the mainstream. Highbanks Creek falls 116 feet from Bristol Lake to it's confluence with Thornapple Lake. The drainage area is 33.9 square miles. Flow measured November 1, 1988 was about 30 cubic feet per second.

The trout water portion of Highbanks Creek averages 17 feet in width and 11 inches in depth. Depths range up to 5 feet. Fish habitat in this area includes rocks, boulders, riffles, overhanging brush (common), logs and pools (moderate), and undercut banks (scarce). Overall fish habitat can be rated as common but not abundant.

Bottom substrates determined in the 1991 survey were 12% rock rubble, 40% gravel, 41% sand, and 8% silt. Water quality information collected in this survey indicated dissolved oxygen greater than 10 ppm, pH of 7-8, and alkalinity of 205 ppm. These parameters were measured only at Thornapple Lake Road, near the confluence. Aquatic insects were abundant throughout the four survey sites and included mayflies, caddisflies, stoneflies, crayfish, amphipods, odonates, and (at Bivens Road only) water pennies.

No public ownership exists along the stream corridor. Access is gained by landowner permission, and there are no known problems with access. Development in the watershed is limited to very low density residential, active crop land, and horse farms.

Fishery Resource

Highbanks Creek has been managed as a trout stream only since 1974. No stocking occurred previous to that date. About 2,200 brown trout yearlings have been stocked at 4-5 sites (115/acre) every year since 1974. The earliest survey on record was conducted in 1967. Sampled were two sites in what is now classified as the warmwater area, and one site in the trout water. The recommendation at that time was to manage as an "intermediate" stream, which is in-between coldwater and warmwater. In 1973 another survey was conducted to investigate the potential for trout management. This survey was much more thorough than the 1967 survey, but the species composition was virtually the same. Table 1 lists the species captured in 1973. None of the species listed in that table were deemed to be overly abundant.

Because of the low abundance of species found in the 1973 survey and the favorable water temperatures in the lower portions of the creek, a trout stocking program was started without conducting a chemical reclamation. Follow-up surveys to evaluate the effectiveness of trout stocking occurred in 1975, 1976, and 1979. Table 3 presents catch-per-hour data for trout from surveys from 1975 to 1991. The trout population did very well in the early years of the stocking program, but declined slowly over time. Angler complaints of poor fishing and intense competition from other species started coming into the District office in 1986. A rotenone reclamation was tentatively planned pending the results of a 1988 survey. The catch of trout per hour was found to be down considerably, to 8.5, and there appeared to be considerable competition from other species. Therefore, a rotenone treatment was carried out in the fall of 1988.

An estimated 117.9 pounds of fish per acre were killed during the treatment. Creek chubs and white suckers were the most abundant and accounted for 71% of the total fish biomass. Brown trout accounted for less than 4% of the biomass.

A follow up evaluation survey was done in 1991 at the same four sites surveyed in the previous four surveys. A 250-Volt D.C. streamshocker was used to sample fish. It should be noted here that a 40% decrease in stocking levels occurred in 1990 because substantial natural reproduction by brown trout was observed during the rotenone reclamation. While reproduction was good, it was not good enough to support the level of fishery that the creek could accommodate.

Benefits of the rotenone treatment, if any, were short lived. The catch rate of brown trout in 1991 was up from that of the 1988 survey but was not as high as in the 1970s nor as high as anticipated (Table 2). Many other species of fish were collected (Table 3). The 1988 and 1991 surveys captured the same number of species, 25, but four species were different. Catch per hour of all species at all sites was 573 in 1989 and was still relatively high, 344, in 1991. Either the rotenone treatment failed to kill all fish, or immigrantion from Thornapple Lake and upstream was extremely quick. It is unfortunate that a follow up survey was not conducted in 1989, when benefits probably were most apparent. By spring 1990 I observed many species of fish between Scott and Bivens Road.

Although many different species are in Highbanks Creek today, the abundance of most of those species is considered low and they probably do not significantly effect trout. I have fished Highbanks Creek each year since 1990, and can state that the brown trout fishery is second to none. Catch rates of trout by myself and another biologist consistently approach three trout per hour, with sizes ranging from 6 to 17 inches. In 1991 I caught two brook trout of hatchery origin that must have been mixed up with stocked brown trout. One brook trout was 14 inches long.

Based on scale analysis, it was determined that almost half of the trout collected in 1991 were wild. The decision on whether a fish was of hatchery or wild origin was based on location and distinctness of the first annulus, and occurrence of regenerated scales. Brown trout collected in 1991 ranged from 4 to 11 inches. Recruitment of young-of- the-year brown trout was poor in 1991. Growth of all brown trout was very good, 1.0 inch above the State average growth rate.

Management Direction

The stocking of brown trout yearlings in Highbanks Creek should continue annually at the rate of 90 per acre. This rate is providing an excellent fishery which I can attest to. While Barry County has several designated trout streams, the rough terrain of some portions of Highbanks Creek makes it unique.

Our goal into the next century should be to maintain the fishery at its present level or increase it when possible and practical. Continued low stocking rates should help provide for increased survival of wild trout because of lessened competition.

Reclamation with rotenone does not appear to be a practical management tool for the creek. Unless the entire watershed were treated and a fish barrier installed near the confluence, any future treatment would likely have about the same result as the 1988 treatment. Monitoring of the fishery by anglers and electrofishing surveys should continue to keep us appraised of the health of the fishery.

Report completed: January 1993

Table 1.-Fish species captured in 1973 by electroshocking Highbanks Creek, Barry County.

Rock bass	Lake chubsucker
Largemouth bass	Creek chub
Smallmouth bass	Common shiner
Yellow perch	Horneyhead chub
Brown bullhead	Common stoneroller
Green sunfish	Bluntnose minnow
Grass pickerel	Rainbow darter
Redhorse spp.	Johnny darter
White sucker	Log perch
Northern hog sucker	Blackside darter

Table 2.-Catch of brown trout by electrofishing at four sites on Highbanks Creek, Barry County, in five surveys.

Survey year	Number of trout	Catch per hour
1975	29	24.2
1976	51	29.1
1979	36	18.0
1988	23	8.5
1991	31	14.4

Table 3.-Species, relative abundance, and length of fish collected by electrofishing at four sites on Highbanks Creek, September 1991.

Species	Number	Percent	[1]

			Length range (inches)
Creek chub	209	29.1	1-8
Common shiner	86	12.0	3-6
Blacknose dace	75	10.4	1-3
Johnny darter	63	8.7	1-3
White sucker	53	7.4	2-11
Northern hogsucker	45	6.3	3-14
Green sunfish	39	5.4	1-5
Brown trout	31	4.3	4-11
Largemouth bass	30	4.2	2-4
Hornyhead chub	14	1.9	2-6
Log perch	13	1.8	2-4
Rock bass	11	1.5	3-7
Yellow perch	9	1.3	3
Central mudminnow	8	1.1	2-3
Hybrid sunfish	7	1.0	1-3
Bluntnose minnow	7	1.0	2-3
Blackside darter	6	0.8	6
Smallmouth bass	2	0.3	3
Brown bullhead	2	0.3	5
Pumpkinseed	2	0.3	3
Golden shiner	2	0.3	2
Rainbow darter	2	0.3	2
Redhorse spp.	1	0.1	3
Grass pickerel	1	0.1	10
Finescale dace	1	0.1	2
Total	710	100.0	

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

Last Update: 08/05/02
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Questions, comments and suggestions are always welcome! Send them to
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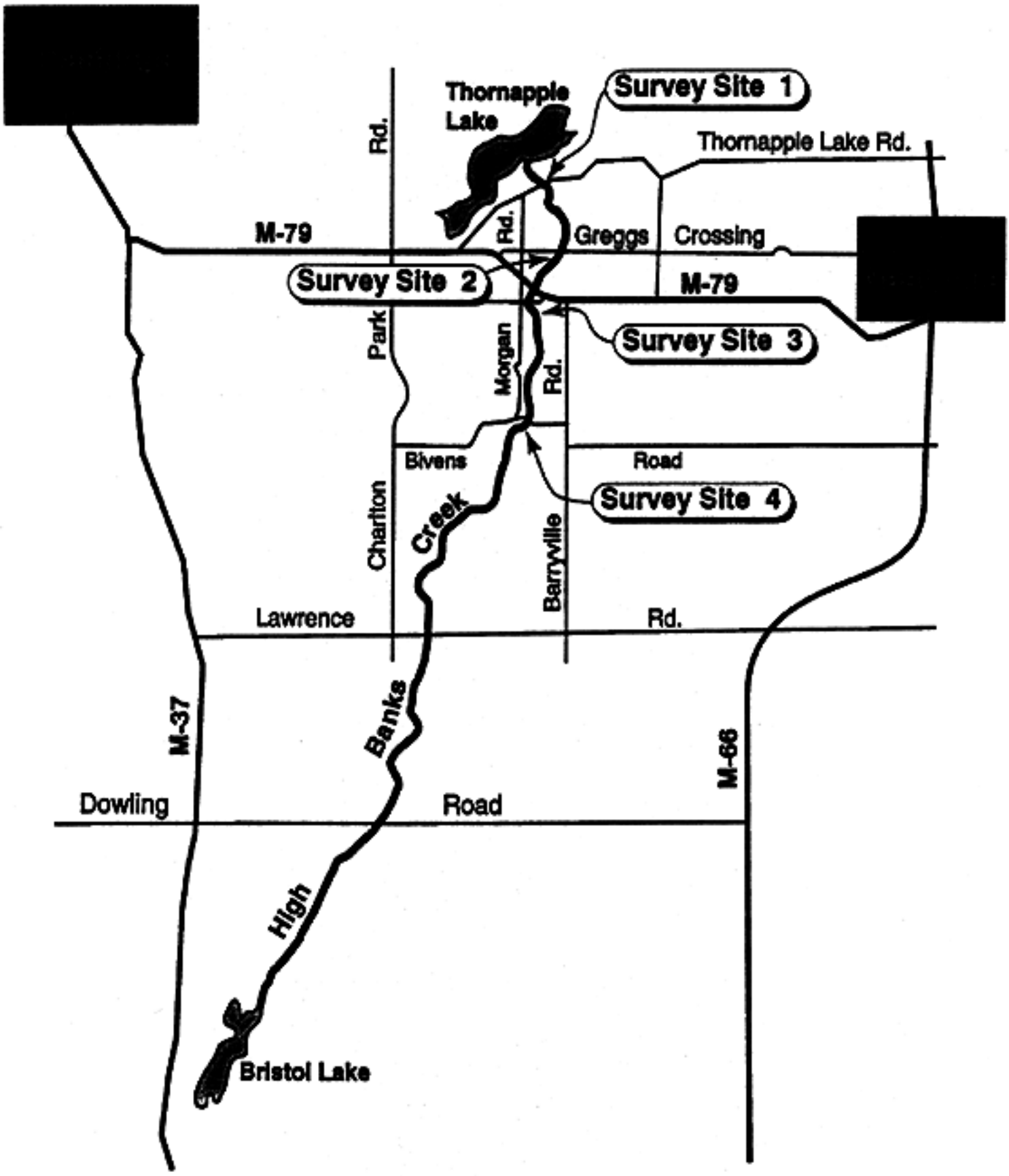

Figure 1.—Map of the High Banks Creek area showing locations of the four 1991 fish survey stations.