

North Branch Carp River
Mackinac County, T43N, R04W, sec. 30
Carp River Watershed, last surveyed 2011

Neal Godby, Fisheries Biologist

Environment

The North Branch Carp River is a designated trout stream in Michigan's Eastern Upper Peninsula. Its headwaters are approximately 5 miles east southeast of the village of Trout Lake. The stream flows about 10 miles in a southerly direction until it joins the mainstem Carp River, which flows into St. Martins' Bay of Lake Huron, north of St. Ignace. Tributaries to the North Branch Carp River include Taylor Creek and East Lake Outlet. The North Branch Carp River watershed is 44.2 square miles, and flows through federal forestland, Hiawatha National Forest, and some private lands

Groundwater helps provide stable flows and colder water temperatures to rivers during summer months helping trout survival. The underlying geology of the North Branch Carp River watershed is not very permeable, and therefore does not provide a lot of groundwater to the river. A small portion of the headwaters has conditions (coarse till) that are good for groundwater. Most of the watershed, however, has only a thin layer of permeable till over bedrock, or just bedrock or clay, which do not produce a lot of groundwater.

The reach surveyed for this report was 1000' of river just downstream of Kenneth Road in Mackinac County. The surveyed reach was in the proximity of a private footbridge across the river, surveying 600 feet downstream of that bridge and 400 feet upstream of the bridge. This portion of the river has thin to discontinuous glacial till over bedrock; indeed, in some portions the stream bottom is exposed bedrock. A majority (64%) of the reach is classified as riffle habitat, with a fair amount (29%) of run habitat and some (7%) pool habitat. Much of the stream substrate was coarse material, as approximately 76% was either gravel, small or large cobble, or boulder. Stream discharge in August 2009 was 12.93 cubic feet per second. Mean July stream temperature is 60.8 to 65.6°F (Table 1).

History

The North Branch Carp River has been managed for brook trout since 1948, with stocking from 1948-1950. The river was first surveyed in 1951, when it had a general reputation of good fishing. A fish community comprised of brook trout, rainbow trout, white sucker, and forage minnows (creek chubs, blacknose dace, brassy minnow, northern muddler (sculpin), and brook stickleback) was observed. Spawning sea lamprey were also observed. The stream habitat was documented in 1952, with coarse gravel and rubble dominating.

The river was again surveyed in 1968, when 21 brook trout (2-8 inches in length) were captured. Dace and chubs were also abundant in the catch, and natural reproduction of brook trout was noted. The 1969 survey noted that, "adequate spawning and rearing habitat for anadromous fish is found in this section of river. One probable salmon redd observed. No salmon seen. The section of stream should support more fish than the survey indicates. Perhaps an impediment to anadromous fish movement is found below the section surveyed" (Fisheries Division files).

The United States Forest Service (USFS) surveyed two sites on the North Branch Carp River in 1993, with one station near the confluence with the mainstem Carp River, and another near the pipeline right of way (Section 30). The downstream station was noted to have excellent spawning area for all types of anadromous and resident trout and salmon and was said to receive a moderate amount of fishing pressure. The upstream station was said to have a very nice population of wild brook trout and juvenile steelhead, with very good habitat. A sand trap downstream of this station was said to not be needed.

Four stations on the North Branch Carp River were surveyed by the USFS in late summer 2003 (Bassett 2004). Those findings are summarized below:

Station 1. This site is near the old bridge abutments near the mouth and is accessed by hiking 2.3 miles from East Lake Road. This section is mainly fast flowing with boulder, cobble and gravel substrate, with a few good pools. The river is flashy here, with water levels rising considerably during spring snowmelt. Spawning and nursery habitat for anadromous salmonids is abundant here. Juvenile steelhead are the dominant salmonid in this reach, with more yearlings than in the upstream reaches. Young-of-the-year (yoy) coho salmon were also present. No brook trout were observed.

Stations 2 and 3. These stations are close in proximity, with one located at the Wicksall property downstream of Kenneth Road, and one located at the North Country Trail (NCT) Crossing. The Wicksall property is where the MDNR sampling site is located; the NCT site was sampled for comparison purposes. Both stations had rocky substrate, dominated by boulders, cobble, and gravel. Differences in gradient result in different widths, amounts of pool habitat, and differences in other features. The Wicksall property station is lower gradient and has more pool habitat and large woody debris. Cold groundwater seepage in both stations offers good refuge for brook trout during hot weather. Both stations support excellent numbers of yoy steelhead and coho, with the highest numbers at Station 2 (Wicksall property). Brook trout were more abundant in station 2, but only 1 fish was in the 7-10 inch size range.

Station 4. This station was located 1.2 miles north of Kenneth Road. Gradient is less in the reach, and beaver activity is higher. There is less shading of the channel here, but groundwater inputs cool the water. A large beaver impoundment at the upstream end of the station appeared to receive a lot of fishing pressure. The groundwater inputs here lead to good abundance of brook trout, including yoy and a few legal-sized fish. Juvenile steelhead and yoy coho salmon were captured, along with northern redbelly dace, creek chubs, pearl dace, blacknose dace, johnny darters, and white suckers.

Current Status

The North Branch Carp River downstream of Kenneth Road (Wicksall property) was surveyed by MDNR Fisheries Division in 2003 (in conjunction with USFS), 2004, 2005, 2009, and 2010. Water levels in this reach were extremely variably, resulting in different sampling equipment being used under different conditions. During low water years, two backpack electrofishing units were used; in higher-water years, a DC-electrofishing barge (streamshocker) was used.

The site was established as an MDNR Fisheries Division fixed site in 2003 under the Status and Trends sampling protocol. The survey reach was initially 550 feet in length in 2003 and 2004, but was

extended to 1000 feet in 2005 due to low catch rates. The location was dropped as a fixed site as part of the Status and Trends program, due to the variability in water levels and fish abundance. We still intend to resample this location periodically.

Eight species of fish were captured during the 2010 survey, with species typical of a coldwater fish community (Table 2). Juvenile rainbow trout dominated the catch, followed by sculpins, dace, and brook trout.

Brook trout densities (number per acre) ranged from 15 to 32 over the survey series, with biomass (pounds per acre) of brook trout varying from 0.82 to 10.04 (Table 3, Figures 2 and 3). Brook trout were growing at approximately the state average growth rate in 2010 (Table 3).

Rainbow trout densities also had a considerable range, from 533 to 1,780 per acre over the survey period (Table 4, Figure 2). Biomass of rainbow trout varied from 2.94 to 16.60 pounds per acre (Table 4, Figure 3). Rainbow trout were growing slightly slower than state average growth rates (Table 2).

Juvenile coho salmon were also present in some survey years. Population estimates for coho salmon were done in 2003 (198 per acre) and 2005 (168 per acre) (Figure 2). This species was also present in the 2004 and 2009 surveys, but population estimates were not done.

The North Branch Carp River is a designated trout stream, with Type 1 trout stream regulations. These regulations include an open season of the last Saturday in April to September 30, a 7-inch minimum size limit (MSL) for brook trout, an 8-inch MSL for brown trout, and a 10-inch MSL for rainbow trout (steelhead), Chinook and coho salmon.

Analysis and Discussion

Flows in this river are highly variable, due to its surficial geology of thin to discontinuous glacial till over bedrock. Unlike many Michigan trout streams, which are fairly stable due to large groundwater inflows, there is not much groundwater activity in this watershed. The limited groundwater inflows do keep water temperatures cool enough (Table 1) to be suitable for trout throughout the year. Salmonid abundance and biomass are a function of river discharge, with more water leading to more pool habitat throughout the summer. In 2009, when water level was higher than normal, the standing crop of brook and rainbow trout was 26.64 pounds per acre. In contrast, the standing crop for those two species was only 8.86 pounds per acre in 2005, when water levels were lower. The limiting factor on trout production in this stream is the highly variable flow.

The North Branch Carp River typically has fewer brook trout compared to other brook trout streams in the Northern Lake Huron Management Unit (Figure 4). Similarly, the total number of salmonids in the North Branch Carp River is generally lower than other trout streams in the management unit (Figure 5). Numbers of trout can be much higher in years with higher flow, however. If the stream had more stable flows with higher groundwater inflow, it would be a more consistent producer of good trout numbers.

Because of its minimal groundwater inflow, this river is particularly susceptible to the effects of beaver activity. The alkaline groundwater it does receive though makes this a very productive river (Bassett 2004). Abundant large woody debris provides good trout habitat in the surveyed reach.

Since the upper portions of this stream get warm, the best section to fish is from about a mile upstream of Kenneth Road down to its confluence with the mainstem Carp River. Adult steelhead are typically still in the river after opening day (last Saturday in April).

Management Direction

The Fisheries Division management recommendations for the North Branch Carp River are consistent with those made by the USFS (Bassett 2004):

1. Encourage beaver control in the watershed, especially upstream from Kenneth Road in Sections 18 SE and 19. After beaver populations have been reduced, remove beaver dams.
2. Discourage management for early successional tree species in the riparian zone to discourage beaver activity.
3. Do not stock with trout. The North Branch Carp River is capable of producing wild trout, particularly if beaver activity can be minimized.

References

Bassett, C. 2004. North Branch Carp River fishery status report. United States Forest Service, Hiawatha National Forest, Manistique, Michigan.

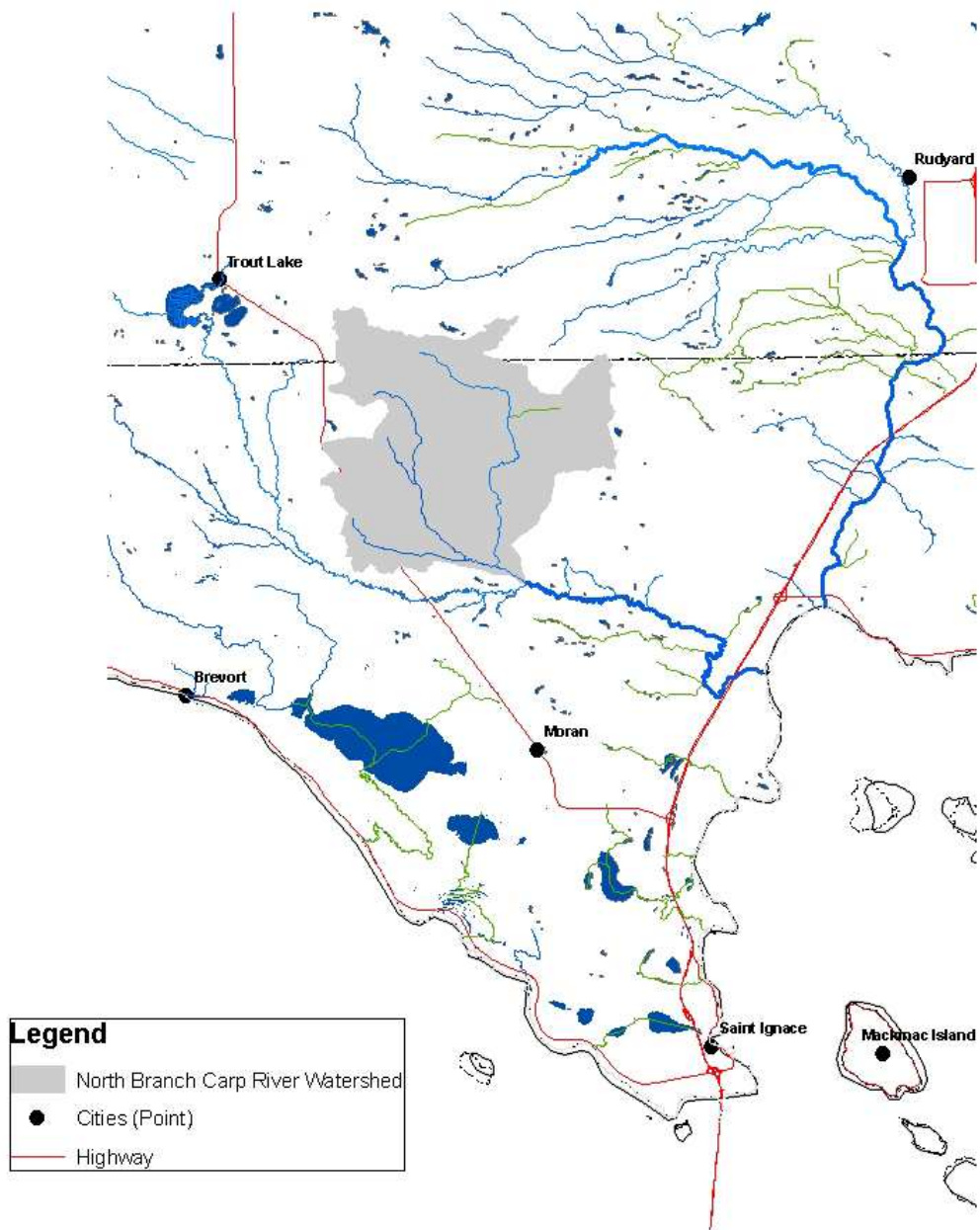


Figure 1. Map of the Carp River watershed. The North Branch Carp River watershed is shaded in gray.

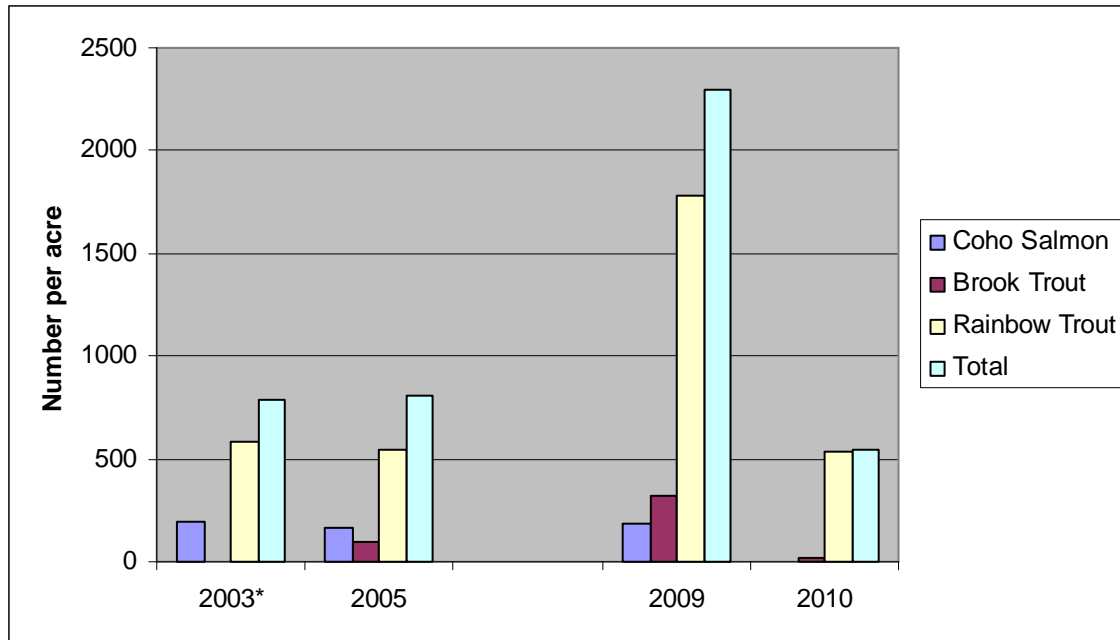


Figure 2. Estimated number per acre of rainbow trout, brown trout, brook trout, and all (total) trout in the North Branch Carp River at Robinson Road, 2003-5 and 2009-10.

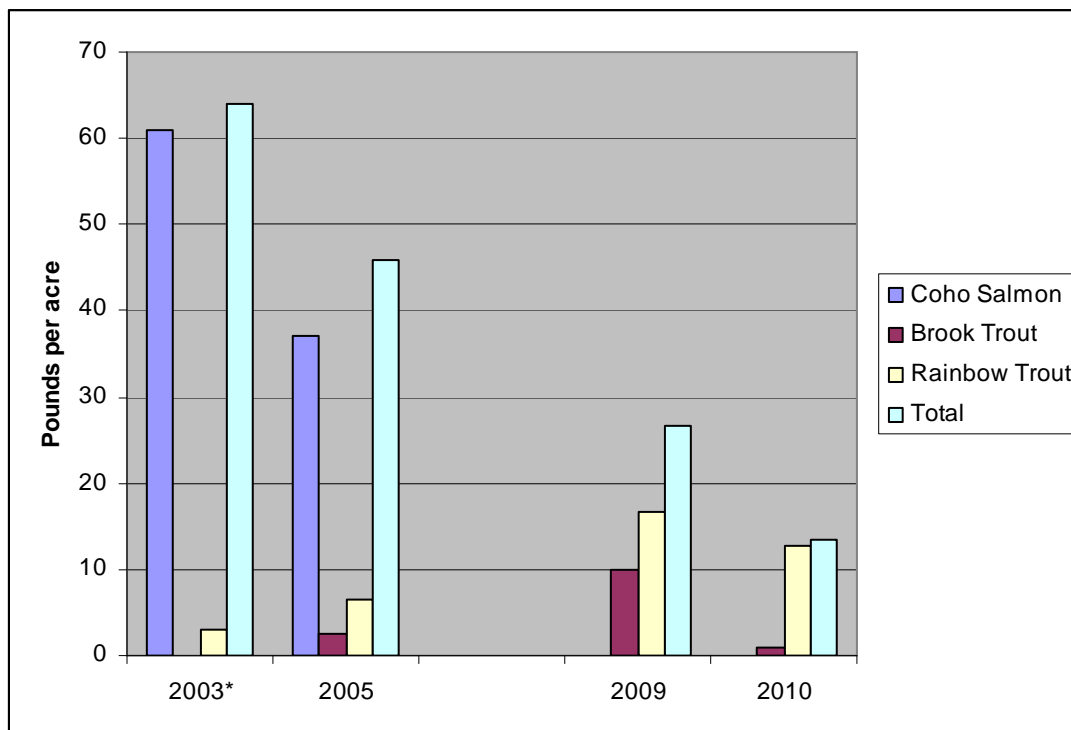


Figure 3. Estimated pounds per acre of rainbow trout, brown trout, brook trout, and all (total) trout in the North Branch Carp River at Kenneth Road, 2003-5 and 2009-10. * A 550-foot reach was surveyed in 2003. In subsequent years, a 1000-foot reach was used.

BROOK TROUT **Northern Lake Huron Management Unit**

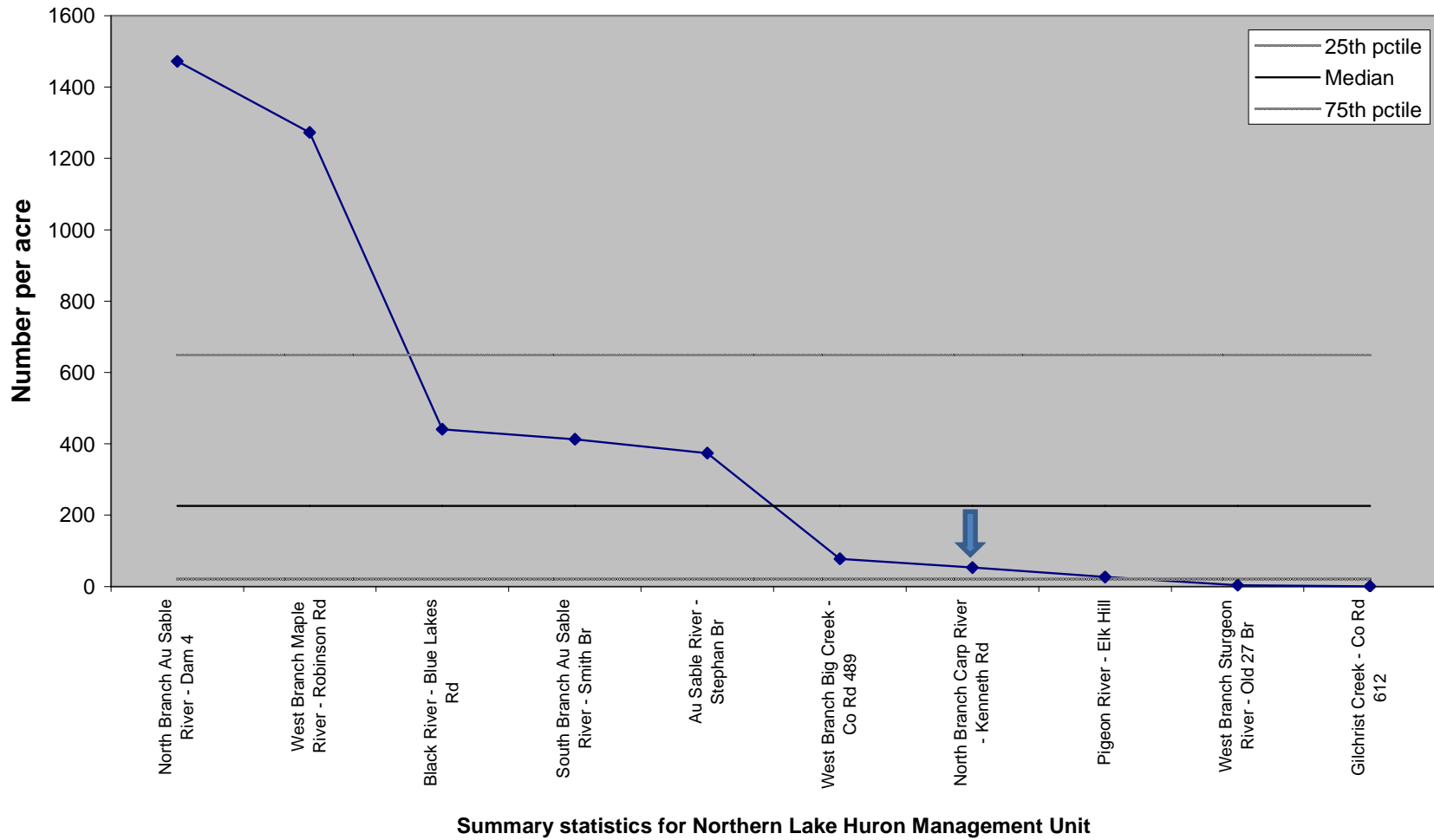
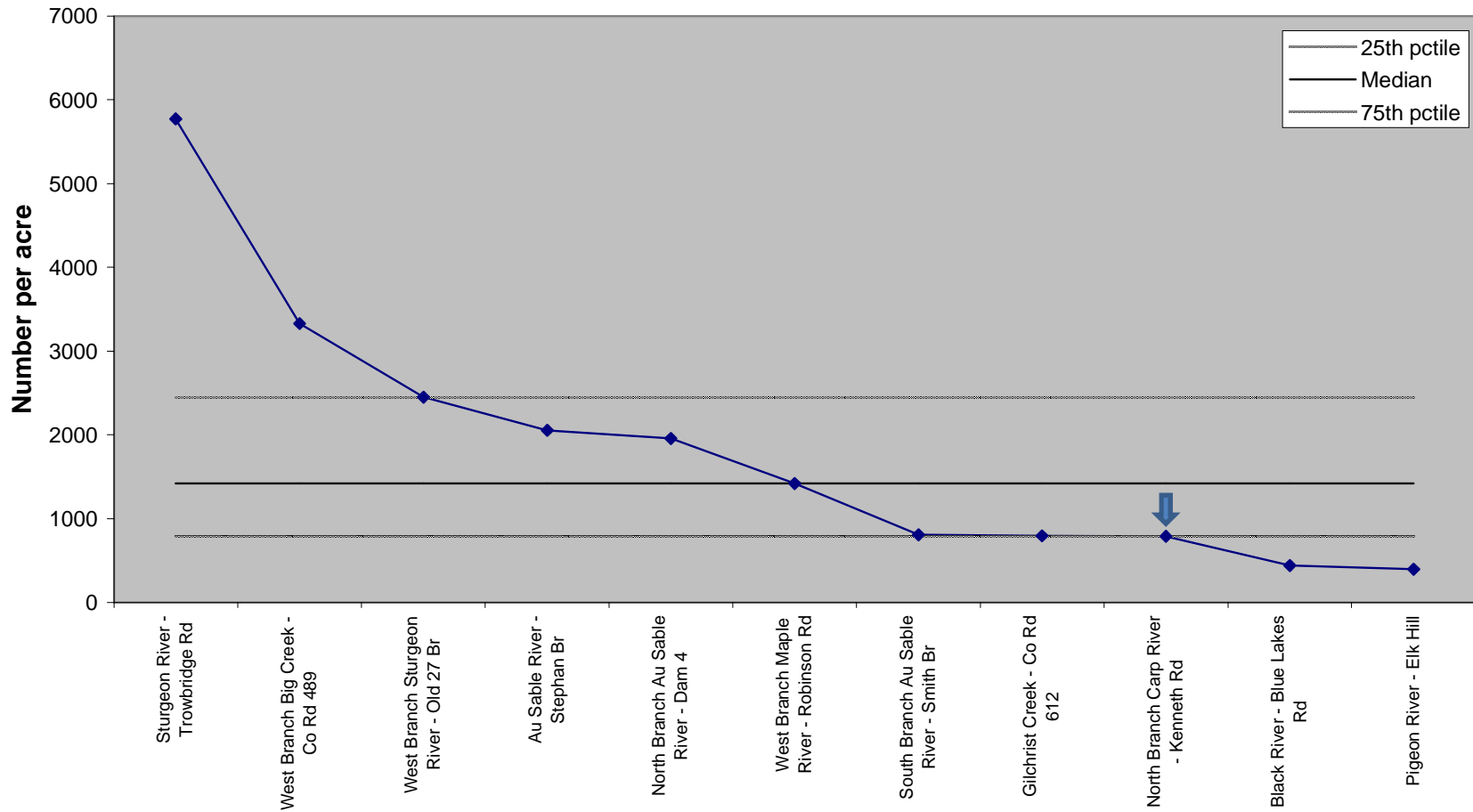


Figure 4. Mean number of brook trout per acre at status and trends sites in Northern Lake Huron Management Unit. Data are from 2002-2008, except for the West Branch Maple River, where data shown are from 2002-2004.

ALL SALMONIDS **Northern Lake Huron Management Unit**



Summary statistics for Northern Lake Huron Management Unit

Figure 5. Mean number of all salmonids per acre at status and trends sites in Northern Lake Huron Management Unit. Data are from 2002-2008, except for the West Branch Maple River, where data shown are from 2002-2004.

Table 1. Mean monthly water temperature during June, July, and August of the North Branch Carp River near Kenneth Road. Temperature was recorded hourly using Onset WaterTemp Pro v2 data loggers.

Year	Mean Temp (°F) June	Mean Temp (°F) July	Mean Temp (°F) August
2004	60.8	64.4	60.6
2005	65.6	67.9	65.8
2007	65.2	65.4	65.7
2009	60.8	61.1	62.4
2010	60.9	66.0	65.5

Table 2. Species, number, percent by number, and length range of fish captured during the August 26, 2010, survey of the North Branch Carp River, Mackinac County.

Species	Number	Percent by Number	Length range (inches)	Growth rate*
Brook trout	13	4.6	2-8	+0.1
Blacknose dace	13	4.6	1-3	--
Creek chub	1	0.4	2-2	--
Iowa darter	1	0.4	2-2	--
Longnose dace	12	4.3	3-4	--
Central mudminnow	10	3.6	2-2	--
Rainbow trout	198	70.5	2-7	-0.2
Sculpins	33	11.7	1-4	--

Table 3. Summary of brook trout population estimate information in the North Branch Carp River near Kenneth Rd.

Year	No./acre	Pounds/acre	Size range (inches)	No./mile
2005	94	2.48	2-7	323
2009	324	10.04	2-12	941
2010	15	0.82	2-8	42.2

Table 4. Summary of rainbow trout population estimate information in the North Branch Carp River near Kenneth Rd.

Year	No./acre	Pounds/acre	Size range (inches)	No./mile
2003	586	2.94	1-5	2,024
2005	545	6.38	1-7	1,872
2009	1,780	16.60	1-7	5,169
2010	533	12.67	2-6	1,549

Table 5. Length frequency for brook trout and rainbow trout captured during the August 26, 2010, survey of the North Branch Carp River, Mackinac County.

Inch Group	Brook Trout	Rainbow Trout
2	2	27
3	2	59
4	5	53
5	--	48
6	2	10
7	--	1
8	2	--