

West Branch Maple River

Emmet County

Cheboygan River watershed, last surveyed in 2009

Neal Godby

Environment

The West Branch Maple River is 16 miles long and drains 93 square miles of land. The entire river is in Emmet County, and arises from the Pleasantview Swamp, a 6,544-acre uninterrupted expanse of organic soils (Tip of the Mitt Watershed Council 2006). This coniferous swamp is surrounded by hardwood ridges which direct the river flow to the north, then east, and then south. Gradient of the river is low in the headwater swamp area but increases towards its approach with Lake Kathleen. Notable tributaries include Brush Creek, which is the outlet of Larks Lake, and Cold Creek. Despite both tributaries being designated trout streams, they are considered marginal trout waters and probably only receive trout seasonally. The upper reaches of the West Branch Maple River, in the Pleasantview Swamp, may also be marginal trout water, but groundwater inputs increase considerably downstream. The river begins in a low-gradient swamp with little groundwater and warmer temperatures and ends with high gradient, high groundwater, and cold temperatures. Pellston is the only population center in this watershed (Figure 1).

The West Branch Maple River is a tributary to the Maple River, which originates at the confluence of the East and West Branches at Lake Kathleen, above Maple River Dam. The Maple River flows into Burt Lake at Maple Bay, and is part of the Cheboygan River watershed. The West Branch Maple River has Type 1 trout stream regulations, which includes an 8 inch minimum size limit for brook and brown trout and a 10 inch minimum size limit for rainbow trout. The daily possession limit is five fish, with no more than three fish 15 inches or larger.

History

Fisheries management in the West Branch Maple River dates back at least to 1938, when 3,300 brook trout (including fall fingerlings, yearlings, and adults) were stocked in the river. Brook trout were stocked consistently in the river through 1965. It should be noted that a large number of the fish stocked were large, including in 1940, when 6,250 adult brook trout were stocked, in addition to more than 7,000 brook trout of earlier life stages. Typically 4,000 brook trout were stocked annually in what was primarily a "put and take" fishery. Brown trout and rainbow trout were also stocked sporadically. Stocking of trout was discontinued in 1966 when it was deemed that natural reproduction was adequate to sustain the population.

The first recorded survey of the West Branch Maple River was done in July 1954, when seven sites on the river were surveyed using an AC electrofishing unit. Only game fish were collected during the survey, the majority of which were brook trout. Nineteen brown trout and three rainbow trout were collected, compared with 33 brook trout. Fifteen of the brown trout were collected at one site, just upstream of Maple River Dam.

The river was again surveyed in 1957 with hook and line, when it was classified as a fair to good brook trout fishery. That survey writeup indicates that a considerable amount of stream improvement work had been done, which had contributed greatly to the fishing. Documentation of that habitat work could not be found.

A 1958 survey was done using a D.C. electrofishing unit. Three species of trout (brook, brown, and rainbow trout) were found in good numbers at most of the sites surveyed. Stocking likely contributed to the abundance of these species at that time.

A 1973 report on the West Branch Maple River indicated that portions of the river were showing damage from large-scale beef cattle grazing and the cattle's unrestricted access to the river. The report indicated that beef cattle grazing was becoming a major agricultural industry in the watershed.

The river was next surveyed in 1976, at Ely Road and Camp Road crossings. The brook trout population was estimated in a 1000' foot reach at each site (Table 1). It was noted that brown trout were not found during the survey. Growth of brook trout at that time was good, with fish on average almost an inch above the statewide average length at age.

Brook trout populations were again estimated in 1982 at Ely Road and Camp Road, as well as at Robinson Road (Table 1). Growth rates of brook trout at Robinson Road and Camp Road were the same as the 1976 survey (0.9 inches above state average length at age). Growth was even better at the Ely Road site, where brook trout were more than two inches (+2.1) larger on average than they are statewide. It is not known what was causing the tremendous growth rates at that location, but it may have been due to agricultural runoff in the watershed.

These stations were again surveyed in 1994, with the addition of Robinson Road site (Table 1). The 1994 estimate was done using a pass-depletion method (Zippen), whereas the other population estimates had been done using mark-recapture (Peterson) methods.

Brook trout populations were estimated in 1998 at the following sites: upstream of Ely Road, downstream of Ely Road, upstream of Robinson Road, and upstream of the old railroad grade (Table 1). This survey showed an overall healthy brook trout population, with fish ranging from 2-13 inches in total length. Numbers of larger brook trout were reported to be lower than in the 1983 survey. Good natural reproduction was noted. Brown trout and rainbow trout populations were also estimated at the Robinson Road station.

Current Status

The West Branch Maple River at Robinson Road is a fixed survey site under Fisheries Division's Stream Status and Trends Program. The site is from the Robinson Road bridge upstream 1000 feet. Under the Stream Status and Trends Program, sites are sampled in three-year rotations (i.e., the site is sampled annually for three years, then not sampled for three years). Trout populations were estimated using the Chapman modification of the Peterson mark and recapture method (Lockwood and Schneider 2000). This report will examine surveys conducted as part of the Status and Trends Program from 2002 to 2004, and from 2008 to 2009.

Brook trout dominated the catch in each of our surveys both numerically and in biomass (Tables 1-3, Figures 2-3). Brook trout density ranged from a low of 702 per acre in 2004 to a high of 2225 per acre in 2002 (Table 2, Figure 2). Brook trout typically comprised 91-92% of the total trout numbers (Table 2). In 2009, however, brook trout comprised 73.4% of the estimated total number of trout. From a biomass perspective brook trout were again dominant, comprising 80.1% to 91.2% of the total pounds of trout per acre (Table 3, Figure 3).

Trout growth rates are very good in the West Branch Maple River at Robinson Road compared with other quality trout streams throughout the state (Figure 4). In 2009, brook trout at this site were, on average, one inch larger than the statewide average length at age. Brown trout were 0.8 inches larger than the statewide average length at age, but rainbow trout were 0.5 inches smaller than the statewide average. Mean length of age-2 brook trout in the West Branch Maple River at Robinson Road was 9.43 inches, compared to a statewide average length at age-2 of 8.5 inches.

Habitat measurements of this reach were done in 2009, following stream status and trends protocols. Average stream width in the reach was 30.21 feet, while discharge on the date of sampling (July 30, 2009) was 23.93 cubic feet per second. The dominant habitat type in this reach is run habitat, while riparian habitat is predominantly tag alder. Bank stability was very good in this reach, with less than 10% of the bank classified as fair or poor in terms of stability. Substrate in this reach is primarily (71.9%) sand, with other substrate types present: detritus/silt (15.8%), gravel (5.3%), wood (4.1%), and boulder (2.9%).

Fish cover was fairly abundant in this reach in the form of large woody debris and log jams. A total of 624 linear feet of large woody debris greater than 6 inches in diameter was in this stream reach. Additionally over 1,100 square feet of log jams and habitat improvement structures were documented. Compared with other status and trends sites within the unit and statewide, the West Branch Maple River had a good amount of instream structure.

Analysis and Discussion

The West Branch Maple River has a large population of brook trout. Among other status and trends streams in the Northern Lake Huron Management Unit, the West Branch Maple River has the second-highest abundance of brook trout (Figure 5). When all trout species are considered, the river's abundance is about average compared to other status and trends streams in NLHMU (Figure 6). Abundance of brook trout in this reach has typically been higher in the surveys starting in 2002 compared to previous surveys (Table 1). Brook trout growth rates remains good, with fish being about one inch larger than the average statewide length at age. The West Branch Maple River is an exceptional brook trout stream.

Brown trout were present in all of the surveys done since 2002, but have remained at low levels of abundance. Brown trout abundance increased in 2009, but still comprised only about 2.5% of the estimated number of all trout in the reach. Brown trout are also growing exceptionally well here, with fish on average 0.8 inches larger than the statewide average length at age. Fast growth of brown trout may be attributed to the low numbers of brown trout in this stream.

The West Branch Maple River was considered by Fisheries Division in 2010 as a possible addition to a list of gear restricted streams. Gear restrictions typically include a larger minimum size limit or no-kill regulations, along with either artificials-only or flies-only designation. The West Branch Maple River was considered for more restrictive regulations because it has a good brook trout population, and high growth rates. High growth rates are important for gear restricted designation, since one of the goals of those regulations is to produce more large trout. To reach a minimum size limit of 10 inches, most brook trout would need to live to age-3. Survival of brook to age-2 in the West Branch Maple River was only about 12 percent, and very few survive to age-3. Gear-restricted regulations are not appropriate for the West Branch Maple River due to low survival of brook trout to older ages and larger sizes.

Management Direction

1. Continue to survey the West Branch Maple River at Robinson Road as part of the stream status and trends program.
2. Maintain Type 1 trout stream regulations on this river, as they are appropriate for the protection of the brook trout population.
3. Continue to manage for naturally reproducing trout populations with no trout stocking intended.

References

Lockwood, R.N., and J.C. Schneider. 2000. Stream fish population estimates by mark-and-recapture and depletion methods. Chapter 7 in Schneider, J.C. (ed.) 2000. Manual of fisheries survey methods II: with periodic updates. Michigan Department of Natural Resources, Fisheries Special Report 25, Ann Arbor.

Tip of the Mitt Watershed Council. 2006. Larks Lake Watershed Planning Project. 43pp. Petoskey, Michigan.

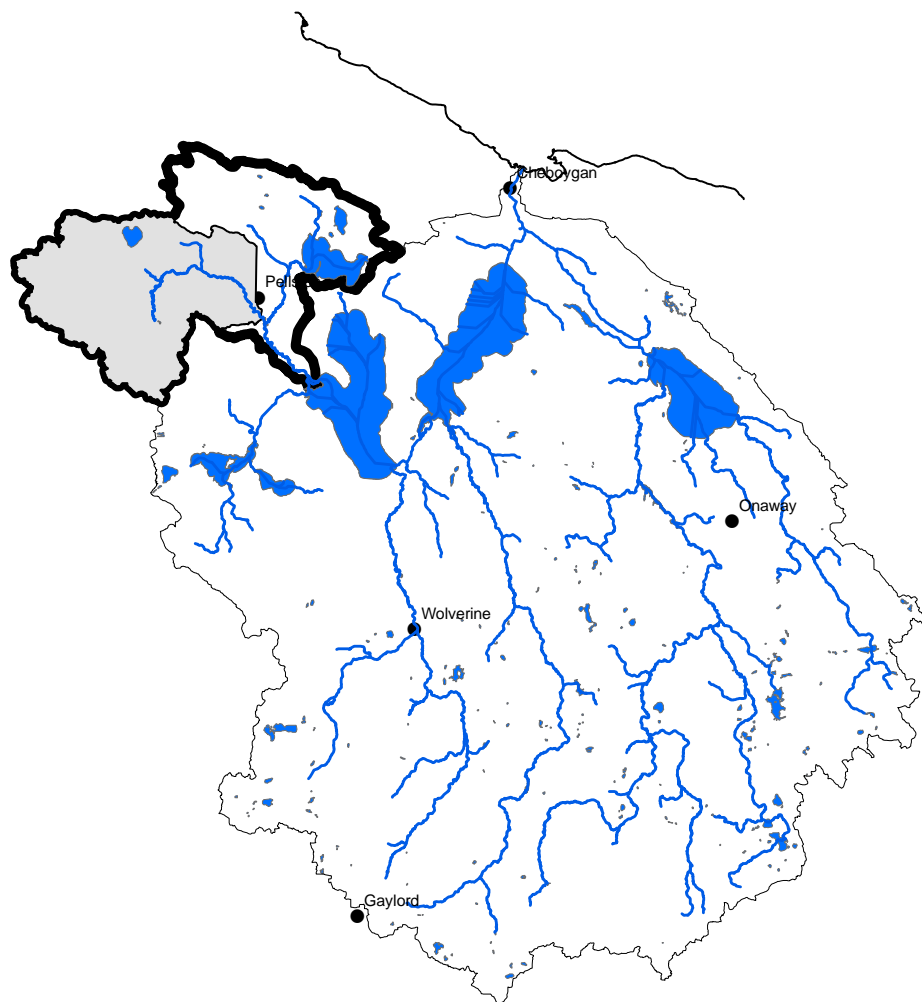


Figure 1. Map of the Cheboygan River watershed. The Maple River watershed is outlined in heavy black, while the West Branch Maple River watershed is shaded gray.

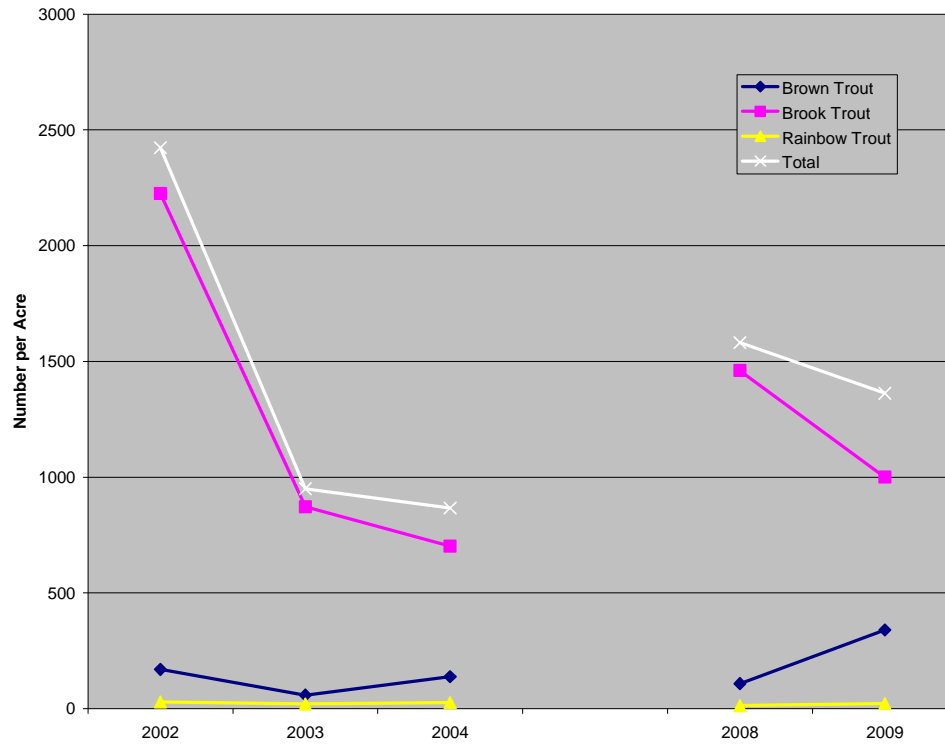


Figure 2. Estimated number per acre of rainbow trout, brown trout, brook trout, and all (total) trout in the West Branch Maple River at Robinson Road, 2002-4 and 2008-9.

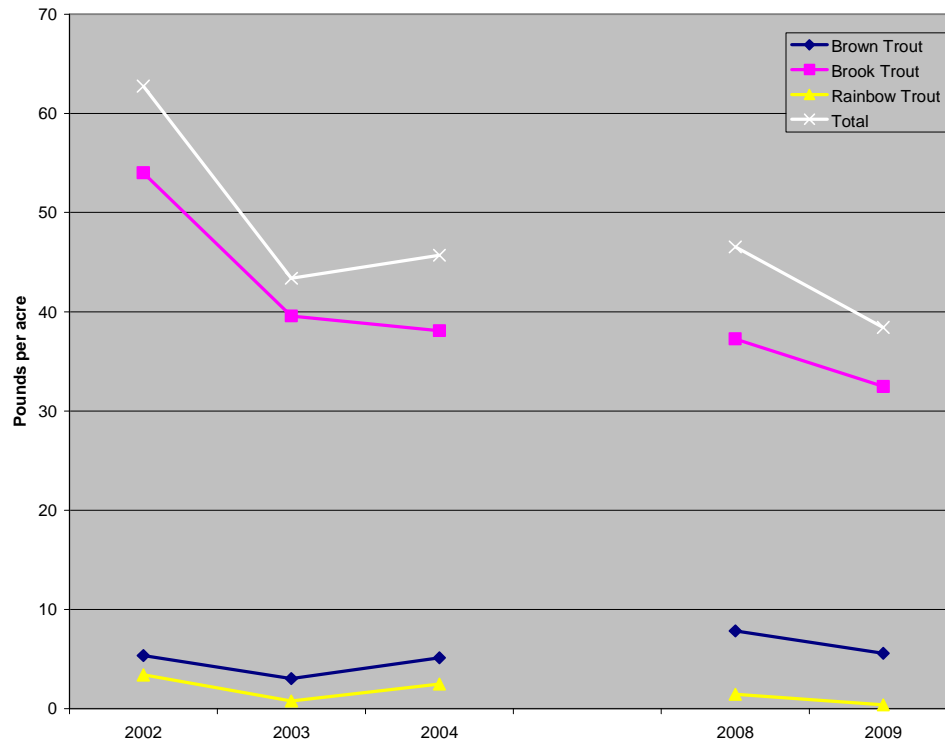


Figure 3. Estimated pounds per acre of rainbow trout, brown trout, brook trout, and all (total) trout in the West Branch Maple River at Robinson Road, 2002-4 and 2008-9.

Brook trout mean length at age 2 (Aug.-Sept.)
The MI state-average length for brook trout in August-September = 8.5 inches

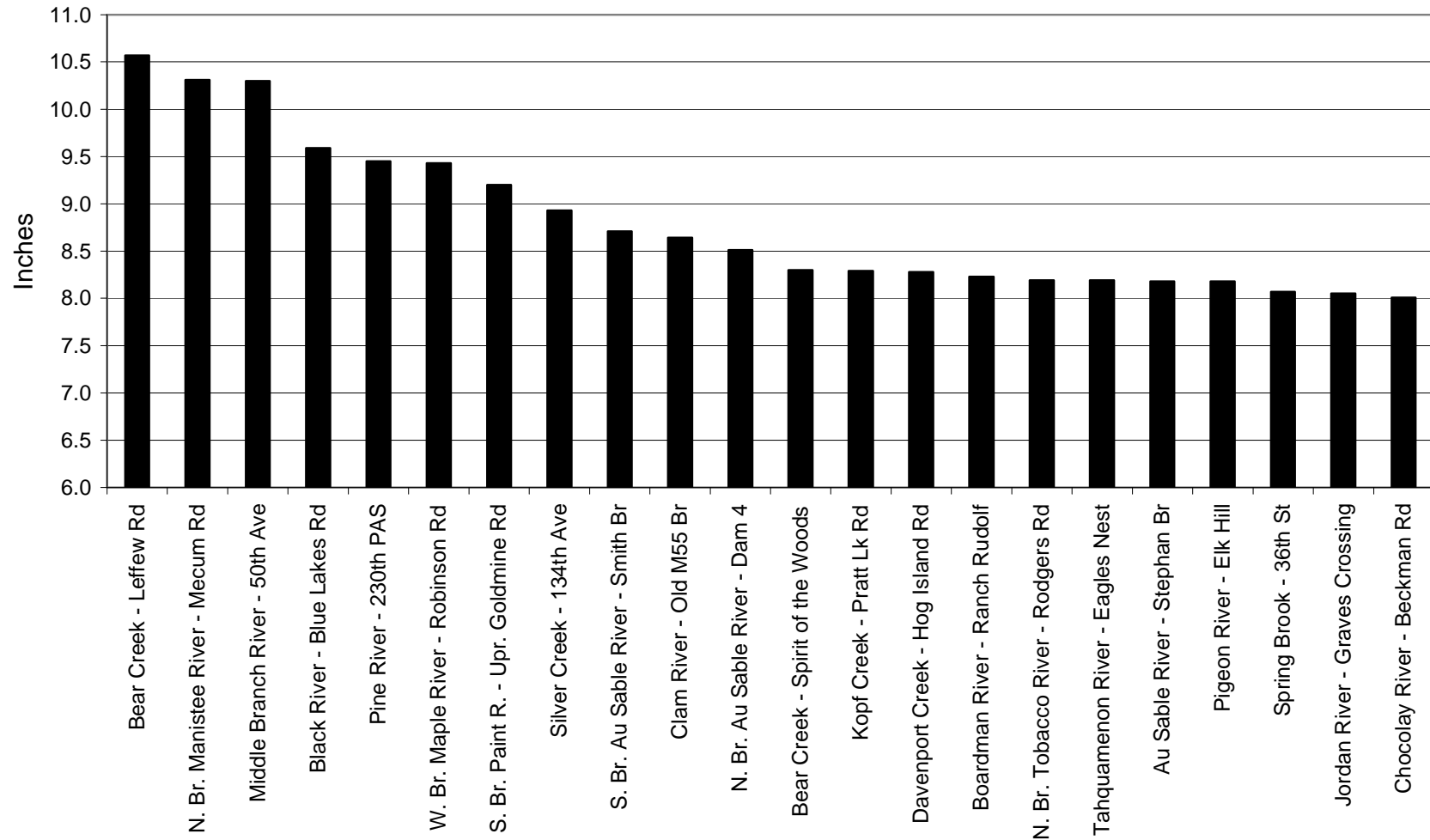


Figure 4. Brook trout mean length at age-2 (August-September) at status and trends sites throughout the state of Michigan. Streams where mean length at age-2 were less than 8.0 inches are not shown to improve clarity.

BROOK TROUT **Northern Lake Huron Management Unit**

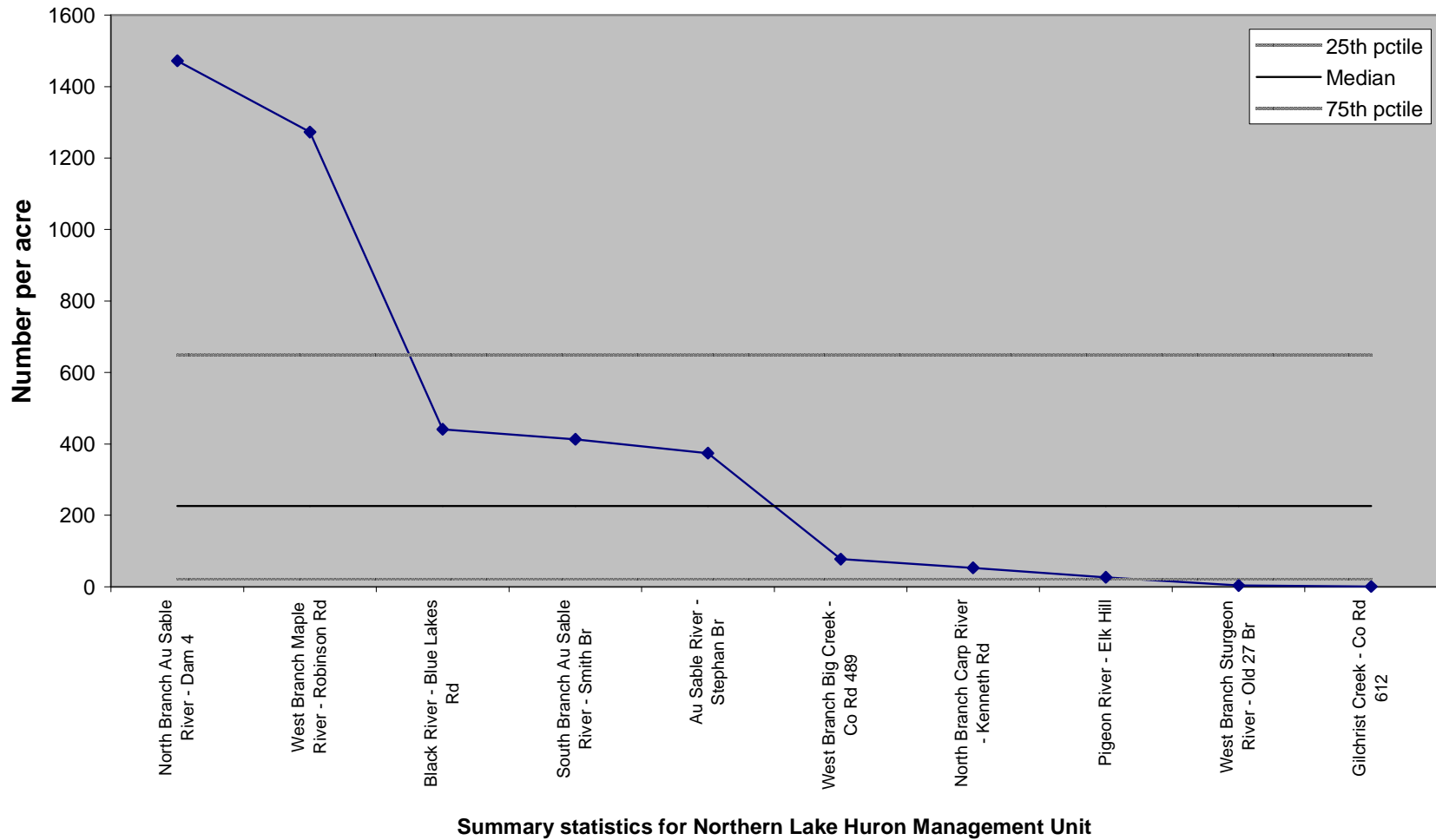
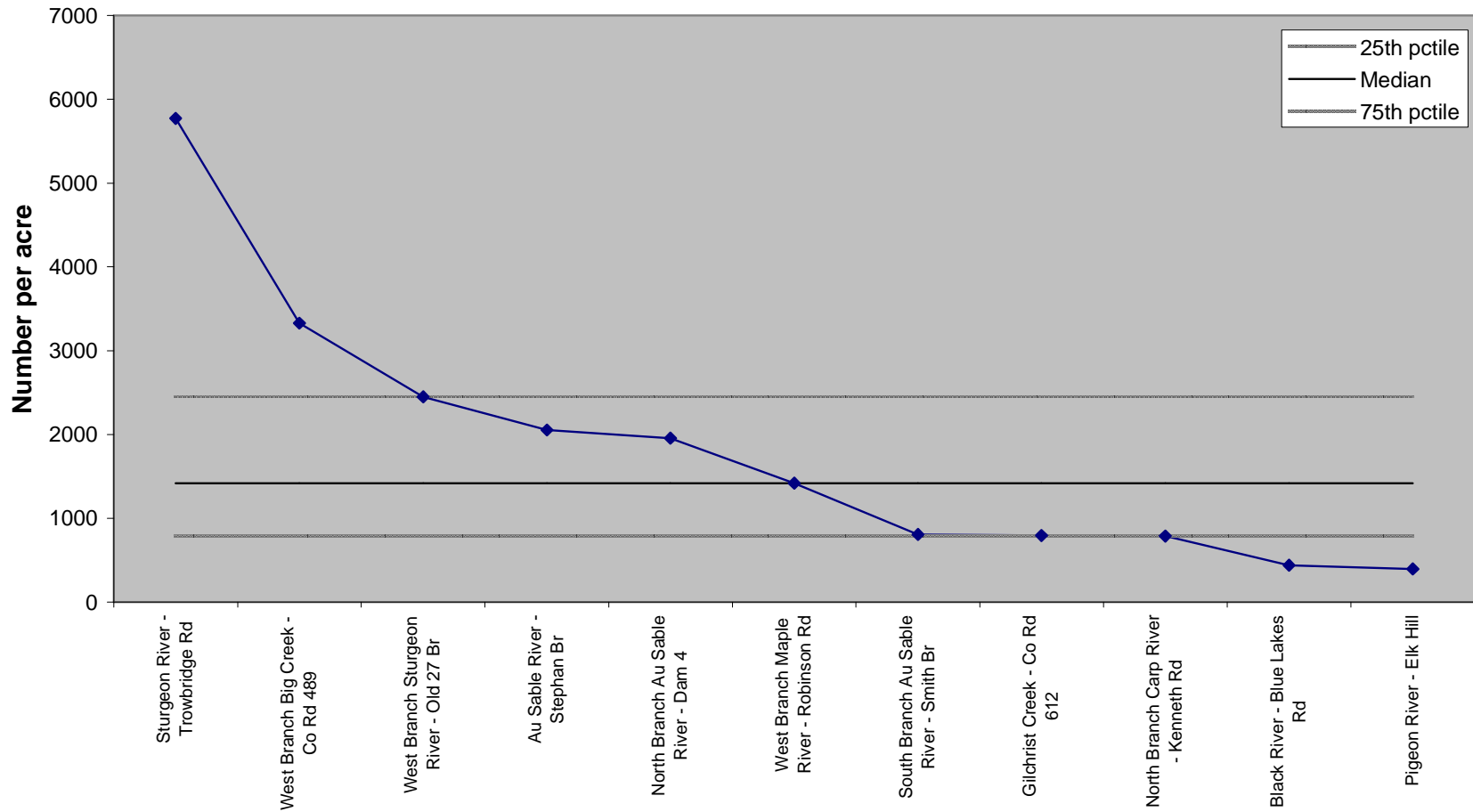


Figure 5. Mean number of brook trout per acre at status and trends sites in Northern Lake Huron Management Unit. Data are from 2002-2008, except for the West Branch Maple River, where data shown are from 2002-2004.

ALL SALMONIDS **Northern Lake Huron Management Unit**



Summary statistics for Northern Lake Huron Management Unit

Figure 6. 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. Brook trout population estimates at various sites in the West Branch Maple River. The estimated number per acre is in parentheses, where reported.

Year	Robinson Rd (1000')	Camp Rd (1000')	Ely Bridge d/s (500')	Ely Bridge u/s (500')	Ely Bridge (1000')
1976	--	132	--	--	622
1982	379	314	--	--	453
1994	197 (795.9)	--	--	--	--
1998	765 (1,142)	430 (896)	227 (946)	354 (2,527)	--
2002	1,536 (2,225)	--	--	--	--
2003	602 (872)	--	--	--	--
2004	484 (702)	--	--	--	--
2008	1,007 (1,460)	--	--	--	--
2009	690 (1,000)	--	--	--	--

Table 2. Estimated number per acre of brook trout, brown trout, rainbow trout, and all (total) trout in the West Branch Maple River at Robinson Road, 2002-4 and 2008-9.

	Brown Trout	Brook Trout	Rainbow Trout	Total
2002	169	2225	29	2423
2003	58	872	20	950
2004	138	702	26	866
2008	108	1460	13	1581
2009	340	1000	22	1362

Table 3. Estimated pounds per acre of brook trout, brown trout, rainbow trout, and all (total) trout in the West Branch Maple River at Robinson Road, 2002-4 and 2008-9.

	Brown Trout	Brook Trout	Rainbow Trout	Total
2002	5.35	53.99	3.39	62.73
2003	3.03	39.57	0.77	43.37
2004	5.12	38.1	2.48	45.7
2008	7.83	37.25	1.45	46.53
2009	5.58	32.46	0.38	38.42