

Temperature Data from Summer 2020

The Hoosic River Watershed Association has for many years collected water temperature information within the watershed for the purpose of understanding and documenting conditions within this cold water fishery. Especially since climate change has been recognized as a concern for cold water fisheries, we have recognized the need for better understanding of, and greater documentation of, conditions within the watershed.

HooRWA started a program of stream temperature monitoring in 1999, which continued through 2005. In 2018 and 2019, we joined with Williams College to continue data collections including water temperatures. During these periods, we collected stream temperature information from 55 different locations. The Hoosic itself was sampled at 17 sites and 7 small tributaries to it were also sampled. A larger tributary, the Green River, was sampled at 11 sites and 4 tributaries to it were sampled. Seven sites were sampled in Hemlock Brook plus one tributary. Eight additional locations were sampled including two on the Little Hoosic, two on the North Branch and 4 on the Walloomsac and its tributaries. Several of these locations were sampled more than once.

The program for 2020 was limited to just HooRWA and water temperature sampling. Starting in mid May of 2020 and ending in early September 2020, we collected temperatures from 6 springs that potentially feed cool water to the rivers and streams in the Hoosic river basin and from 3 locations on Broad Brook and 3 locations on Hopper Brook. Our objective was to determine the potential importance of mountain springs on the streams and to document conditions within two additional streams of importance in the Hoosic basin.

SPRINGS

It is likely that many of the perennial tributaries within the Hoosic watershed are at least partially spring fed. We would expect that water from springs, especially deep springs, would respond only very gradually to climate change. And thus could be quite important for buffering cold water fisheries from warming. Six springs on and at the base of Mt. Prospect were studied. We placed temperature data loggers, with readings taken at one hour intervals, and collected data over the 108 day period.

The sensors were checked in mid July at which time 4 of them were exposed to the air as the flow from the springs had decreased. They were repositioned at that time. In Sept., Only two of the 6 springs were flowing sufficiently to cover the sensors, two others were just a trickle and two were no longer flowing. The two just trickling feed into an intermittent stream that flows north to the Hoosic and likely are of little value during the summer months for maintaining the cold water fishery.

The two still flowing, one at an elevation of 1930 feet and the other at 1280 feet, both feed into a tributary to the Green River labeled as Wing Brook. This brook is mapped by the Massachusetts Fisheries as a cold water fishery up to the location of the lower spring. The

temperature of the water from the lower spring increased steadily from 45 degrees Fahrenheit (F) initially on 5/19 to 51 degrees on 9/3 when the sensors were removed. The temperatures at the upper spring were 44 degrees and 48 degrees respectively. The temperatures of the waters flowing from the springs did not show any diurnal or seasonal fluctuations, only a steady gradual increase over the measurement period. It would appear that these two springs, and similar ones, could indeed be important for maintaining the cold water fishery.

STREAM TEMPERATURES

The stream temperatures follow both daily and seasonal fluctuations. A basic parameter used in cold water fisheries assessment is the maximum mean temperature over a 7 day period. The 7-day mean temperature varies considerably over the study period (Figure 1). The period of maximum concern for the fishery is normally found in mid to late July. And for the two stream systems studies in 2020, it was the 7 day period centered on July 26 that had the maximum mean weekly temperatures.

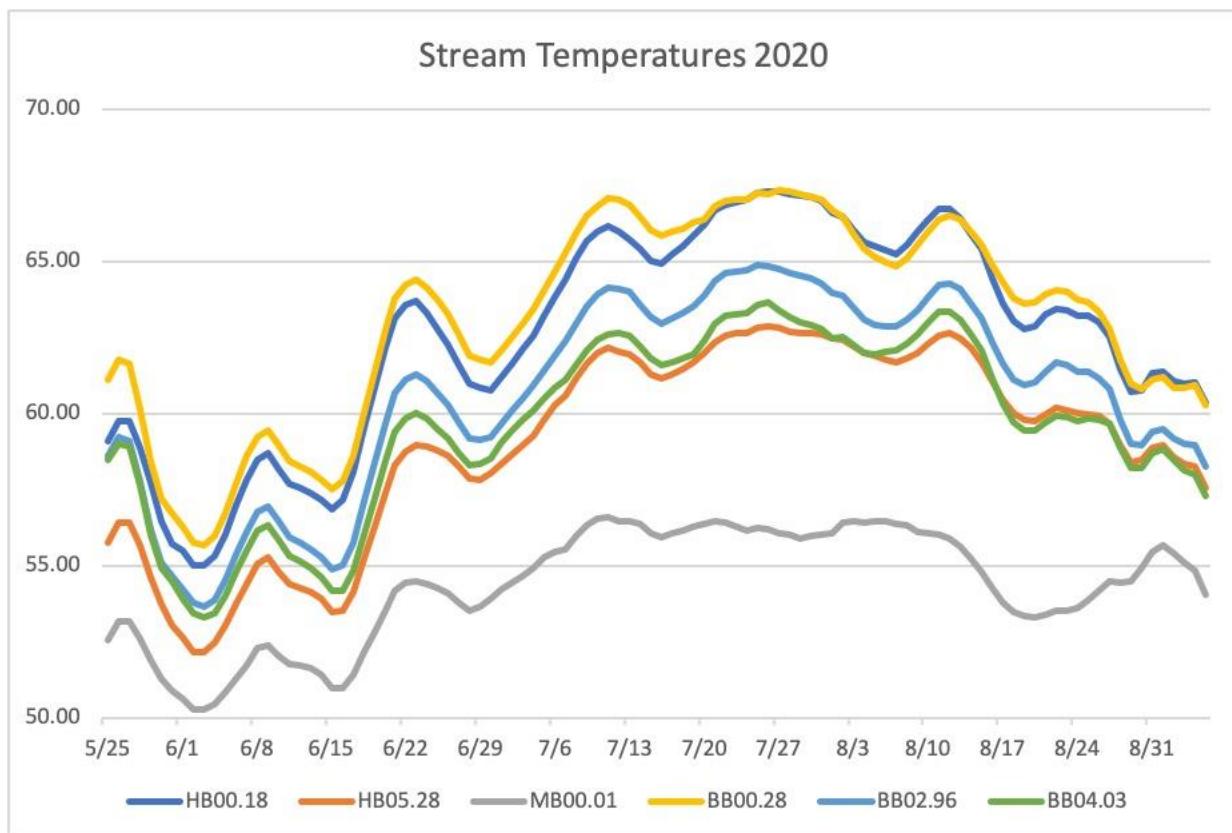


Figure 1.
Hopper Brook at Mt. Hope Park (site HB00.18 in which the number represents distance in kilometers from the confluence with the Green River) had a mean weekly temperature of 67.3 degrees F. on this day. Farther upstream just above the confluence of Money Brook with Hopper Brook (HB05.28) the mean weekly temperature was 62.9 degrees, or 4.4 degrees

cooler. And Money Brook (MB00.01 or 10 meters from its confluence with Hopper) was considerably cooler still, at 56.2 degrees.

Broad Brook near its confluence with the Hoosic (BB00.28) had a mean 7 day temperature of 67.3 degrees F. on July 26. This site is just off the StienerFilm parking lot. Farther upstream opposite the Town's Deans property and the White Oaks Congregational Church (BB02.96) the 7-day mean was 64.9 degrees. And even farther upstream in Vermont and upstream of an old dam (BB04.03) the mean temperature was 63.7 degrees.

As would be expected, the streams become warmer as the distance from their headwaters increases and as they flow through more open areas. Of interest is that the maximum mean temperatures for both streams just before they join the next larger one are the same (67.3 degrees). Because the upstream temperatures for Hopper Brook are lower than those measured in Broad Brook, this observation was a surprise.

Broad Brook does have a larger drainage area (10.4 square miles compared with 6.7 sq. mi. for Hopper Brook). Much of this drainage area is in Vermont and overall, the watershed is 93% forested compared with the Hopper Brook watershed at 88% forested.

The information obtained during the summer of 2020 does add to our understanding of conditions within the Hoosic cold water fishery as well as raise addition questions.