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Learning from Cheesecake Brook

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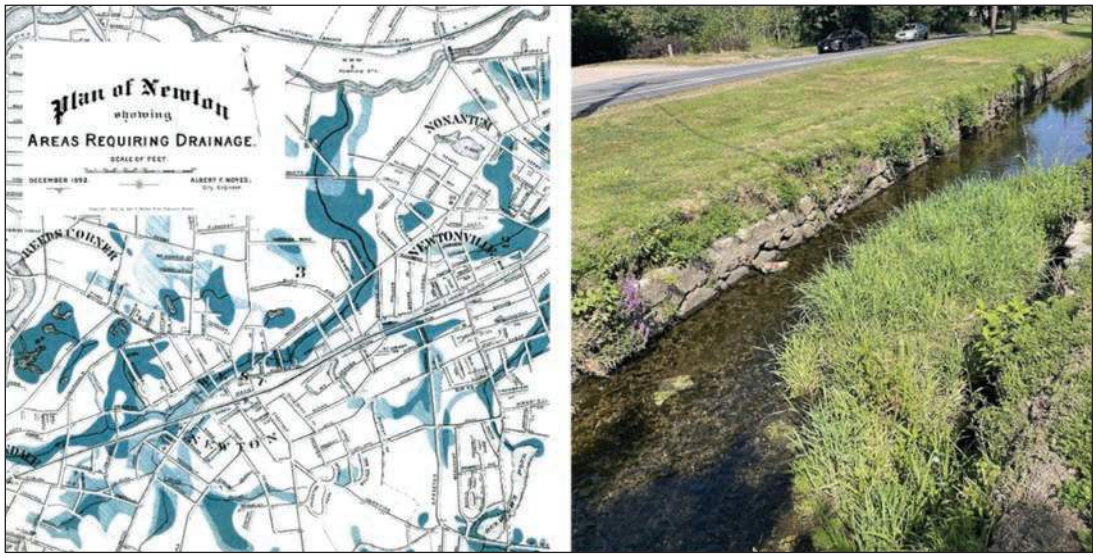

Figure 1. *Left, in an 1892 map, wetland and riparian corridor around Cheesecake Brook are identified as "Areas Requiring Drainage." Right, as chunks of turf fall into the brook they begin to recreate a meandering flow pattern, and provide valuable habitat within the confines of the channel.*

Newton's Cheesecake Brook tells the story of urbanization and our shifting attitudes about the natural environment. Previous interventions, which focused on drainage (Figure 1) and creating usable land, resulted in a stream with degraded water quality and ecology that is prone to harmful flooding. Today, restoration efforts are writing a new chapter in the brook's history to mitigate flooding, increase ecological health, and create a riparian corridor that is an amenity to the public. These efforts are an essential part of the ongoing clean-up of the Charles River. For the Charles, addressing untreated stormwater runoff is the key step for achieving the Clean Water Act's goal of a fishable-swimmable river that is free from bacterial contamination and harmful algal blooms. After Boston, Newton is the second largest source of stormwater pollution into the river.

Before colonization, Cheesecake Brook, like much of the Charles River Watershed, was an interconnected series of wooded streams and wetlands. With spring rains and snow-melt, high flows would seasonally change the course of the brook, overtop its banks, and reunite the river to its floodplain. Eroded soils carried by fast-moving water were deposited along the edges of the brook, providing gently sloping deposits of sediment perfect for wetland plants and maintaining an ever-changing patchwork of complex habitat in what ecologists call "dynamic equilibrium."

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Over the years, human activity has dramatically reshaped the brook. Maps from the 1700s show four roads crossing the brook as it flows through large tracts of farmland and past a few scattered homes. In the late 1800s, the construction of the Boston & Albany Railroad bisected the northern and southern portions of the brook, resulting in dense development and dozens of stream crossings. By the 1920s, much of the northern stretch of the brook was surrounded by dense housing lots. The Albemarle roadway formalized and constrained the path of the brook in its modern alignment. This project, which was initially part of the 1893 metropolitan plan, was conceived of as a way to preserve the brook, allowing the bordering neighborhood to face a central green corridor.

By the 1930s, these successive waves of residential development had created a new hydrologic regime, one in which rainwater flowed quickly off roofs and paved city streets into municipal storm drains before being discharged directly to the brook. In 1937, the Works Public Administration deepened the Albemarle Channel and constructed the masonry walls that we see today. Paradoxically, the consequence of "improved drainage" was significant and harmful flooding.

Today, the brook suffers from what watershed scientists refer to as "urban stream syndrome": patterns of natural drainage have been replaced by a "flashy" system in which water levels rise rapidly following precipitation and decrease dramatically during periods of drought. This leads to high water temperatures (Fig. 2), water pollution, and degraded habitat.

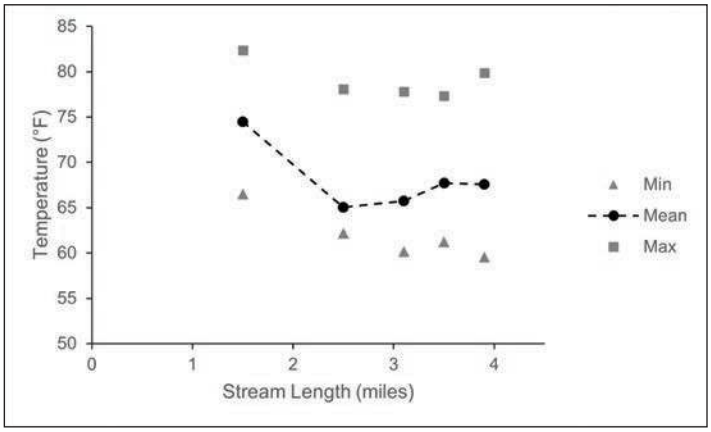

Figure 2. *During the daytime, June-July temperatures in Cheesecake Brook reach into the 80s, creating hazardous conditions for many aquatic organisms. The brook is already warm as it flows out of the Brae Burn Country Club impoundment and behind McGrath Field. The brook cools substantially as it flows underground through one mile of buried culvert and begins to heat up again as it flows through exposed areas along Albemarle.*

Over the past few years, Charles River Watershed Association has partnered with the City of Newton to address these concerns. This year, the city completed installation of a 50,000 CF infiltration system beneath Albemarle Park along Craft Street that diverts stormwater from a seven-acre residential drainage area, letting it soak slowly into the ground and virtually eliminating stormwater pollution. By next summer, over one acre of stream bank will be replanted with native perennials, shrubs, and trees to recreate a native habitat along the brook for the first time in nearly 100 years. These efforts alone will not fix the brook, but they represent scalable solutions that can be used up and down Cheesecake Brook and throughout its 3.2 square mile watershed.

Despite its challenges, Cheesecake Brook is not dead! Today, the masonry walls are nearly 90 years old, and in many places, they have started to cave inwards. Generations of turf have accreted above the walls and periodically slough into the channel, creating spontaneous grass wetlands. These wetlands interrupt the uniform flow of the brook, creating thin fast-moving riffles that scour out small deeper pools, and forming slow moving eddies where fish can rest.

Figure 3. *A juvenile white sucker collected from below the Craft Street Bridge (image courtesy of Jeff Moore, Native Fish Coalition).*

On a recent visit to the brook, the water ran clear approaching one of the grassy islands. I saw multiple blue damselflies and heard the plunk of a frog into the water. Fish swim in the brook's waters, including a handful of minnows I watched (Figure 3) scatter upstream, out of the shade in which they were hiding. Despite its constraints, life-generating natural processes are still at work in Cheesecake Brook! Our values are different than those of earlier generations; we understand that wetlands support aquatic health and that riparian corridors enhance urban areas and are essential for preserving biodiversity. By partnering with nature, we can recreate natural hydrology around the brook to boost baseflows, cool water temperature, reduce pollution, and create a restored urban stream that can sustain the next generation of Newton residents. ◆