

The Real Price of a Green Lawn: A Critical Look at the Drying Ipswich River

If you had the privilege, like I did, of winding your way down the beautiful Ipswich River this past summer, you'd know why some people dedicate their life's work to protecting it. Spanning 45 miles from Burlington, Massachusetts all the way to Plum Island Sound⁷, this river provides drinking water for over 350,000 people^{8 12}, supports a multi-million-dollar shellfish industry^{3 12}, contains diverse, high-quality aquatic habitats¹, and offers a plethora of unique recreational opportunities for residents¹². It's also, as I learned after my first paddle down its tranquil current, one of the most endangered rivers in the country¹². In 2019 alone, extreme low flow events — times when the river flow was low enough to damage river ecosystems — were observed for 44 days during the summer and early fall^{3 9 11} with much of the upper half of the river running completely dry in the summers of 1995, 1997, 2001, 2002, 2005, and almost every year since³. Section 303(d) of the Federal Clean Water Act lists it as a water body not in compliance with the Massachusetts Water Quality Standards^{12 14} and the river has lost many members of its once strong brook trout, herring, and fallfish populations due to the damaging low flow events^{2 8}. These figures paint a bleak portrait: a once-strong Ipswich River limps towards an increasingly desolate future with the burden of 14 water-hungry communities atop its back. So how did we get here? And, perhaps more importantly, is there anything we can do about it?

The Ipswich River's water policy story starts in 1986. Sadly, that's also where most of it ends. The 1986 Massachusetts Water Management Act (WMA) allows the Massachusetts Department of Environmental Protection (DER) to set limits on water withdrawals from the Ipswich River^{7 12} when those withdrawals surpass what communities already used in 1986⁸. To

set these limitations, the act averages a water user's withdrawal amount across a full year (entirely neglecting the heavy seasonal differences in water usage) and assigns them to one of three categories based on a 100,000 gallon-per-day benchmark: those who withdraw more than this number make up the first category, those who withdraw less make up the second, and those who use more but have no registration to do so comprise the third^{7 12}. The law compels only this third group to obtain permits and comply with water conservation restrictions^{7 12}. It completely exempts the other two. This act, viewed by many as flimsy even for its time, is still the dominant policy regarding water conservation for the Ipswich River. Confusingly, each town within the watershed also makes its own decisions on water conservation⁵ and water supply¹³. While one town may correct the gaps in the WMA by issuing additional water restrictions during times of drought, another exploits them. While one resident conserves water provided from the town, another may splurge on privately dug well water. But all of this life-giving resource comes from the exact same place. Groundwater and surface water are heavily connected in the Ipswich River Watershed, with one shared aquifer beneath the ground⁸. So, this water conservation policy looks less like an effective system and more like a broken puzzle: residents all have one picture to work towards in order to ensure enough water for everyone, but the pieces used to achieve it — the fiefdom-like policy structure of individual towns — just don't fit together.

This inadequate policy structure facilitates massive residential and commercial water withdrawals. From 1989 to 1993, average monthly water use from all sources along the river already exceeded monthly mean streamflow¹⁴ and has only increased since then. This withdrawal has worsened dry river reaches, increased the frequency of fish kills, and elevated concerns about seasonally inadequate water supply¹³. Worse still, these impacts occur at some of the most

resilient parts of the river: in order to properly maintain aquatic habitat and a reliable drinking source for humans, experts recommend that the river maintain flows of $1.87 \text{ m}^3/\text{s}$ in May and $0.62 \text{ m}^3/\text{s}$ from June to October¹⁵. Yet, for the past ten years, the two prominent stream flow gauges on the river, ones placed at arguably its healthiest sections⁸, consistently measured flows of less than $0.42 \text{ m}^3/\text{s}$ throughout the entire summer^{9 11}. The excessive water withdrawals force the river far below its recommended flow levels all summer, every summer.

But the Ipswich River isn't just a victim of broken policy. Social and economic factors play a vital role as well. I sat down with Rachel Schneider and Patrick Lynch, two staff members of the Ipswich River Watershed Association (IRWA) — a local nonprofit that has been fighting for a healthy Ipswich River for over 30 years now — to find out more about what causes these excessive withdrawals. Landscape irrigation, it seems, deserves the most blame^{5 8 15}. According to a water quality case study conducted by IRWA for Mass DER, residents within the Ipswich River Watershed want their lawns to be green, to look like their neighbor's lawns, and to be safe for kids and pets to play on⁴. They use tons of water to achieve these goals and businesses charge them heavily for it. Residents are also both economically and physically distant from the effects of their water usage. Currently, no price on water in the Eastern United States exists. The only costs for residents come from transportation of the resource⁵ and the maintenance of town water lines and treatment facilities⁸, creating a profit disconnect where the “price” of water does not fully reflect the ecological price of its withdrawal. A strong spatial disconnect exists as well¹³, as almost 80% of water taken from the Ipswich River is exported beyond its watershed². Farms and breweries, prominent cultural mainstays of the area, also rely on large quantities of water to create their products. We can think of these strong economic and social incentives as conduits

that hemorrhage huge quantities of water every day. Policy, instead of acting as an effective plug, has only strengthened their flows.

Luckily, the disproportionately negative impact of landscape irrigation allows for a relatively straightforward solution. More water must return to the Ipswich River system while withdrawals lessen² and, in fact, if all residents stopped excessively watering their lawns, a healthy streamflow throughout the year would be quite easy to maintain^{5 8}. And, according to Patrick and Rachel, fixing and standardizing the broken policy system surrounding statewide water conservation benefits more than just the Ipswich River. By doing so, residents will partake in a more resilient water supply with consistently higher and healthier flow rates, businesses that use and sell water will no longer have to worry about the dizzying variety of restrictions individual towns currently have in place, and native residents — whose needs go largely unheard in the context of Massachusetts water issues — may receive additional protections for their traditional lands. And, of course, the great blue herons, river otters, and thousands of other species that make the area unique will no longer be at risk of losing their habitat.

Ultimately, for this kind of change to persist on a large scale, we need political reform. According to IRWA, this means implementing new statewide regulations and restrictions aimed at making all water users play by the same rules, regardless of what town they live in or whether they own a private well. It means bringing together businesses, residents, and state legislature to form new agreements on water usage and conservation. It means installing new flow measuring stations, instituting an equity-based price on water, pursuing Low-Impact Development⁷ and Sustainable Local Management¹³. It also means, should those efforts prove insufficient, the use of alternate water resources — such as the Quabbin Reservoir that currently provides water to

Greater Boston⁸ — to divert some of the water needs of the 14 communities that currently rely on the Ipswich River.

Social and economic incentives may ease the river's burden as well. Teaching residents about the benefits of water conservation and the ways in which water systems work are efforts that organizations like IRWA have steadily supported for years now⁸. Block rates, or proportional increases in water bill prices as water usage goes up, can take advantage of market forces to reduce usage as well. These methods, when combined with meaningful political reform, could help to save the increasingly stressed Ipswich River.

And now is an especially crucial time for this reform. In December, MassDEP will finally announce new conditions for water withdrawal permits and registrations, issuing the first prominent changes to the Water Management Act since its inception^{5 8}. A prominent drought bill allowing MassDEP to restrict non-essential water use during times of drought also makes its way through the state legislature, with hopes of approval by early 2022⁵. And groups such as Senator Bruce Tarr's North Shore Water Supply Resiliency Task Force bring businesses, residents, and policymakers together to work on water conservation solutions.

But if these efforts fail, what awaits residents of the Ipswich River Watershed? Ultimately, a terrifying race to the bottom: as climate change-fueled droughts become more severe, conflicts between water users will likely increase⁵. Residents with the means to move to communities with greater water resources — or looser water restrictions — will do so, leaving behind already vulnerable residents to fend for what's left. And coastal communities in the watershed will have to battle the dual-headed beast of severe storms and decreased water supply. It seems, unfortunately, that these citizens are compulsory riders aboard the most poorly

designed locomotive known to man, its fuel water and its destination the steep cliff that is a dry Ipswich River. Residents, businesses, and policy makers each have a collective hand on the switch to change course, but it's rusted from years of neglect and that cliff is no longer just a speck in the horizon. Only one question remains: can they pull it in time?

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