
Water Conservation and
Private Wells

Fish Habitat

- Upper Charles River fish habitat suboptimal to marginal.
- Habitat quality governed by summer stream flows, water quality, dams, invasives, and bottom-sediment quality.
- Low summer flow restricts cover and habitat, raises water temperature, reduces DO and waste assimilation capacity.

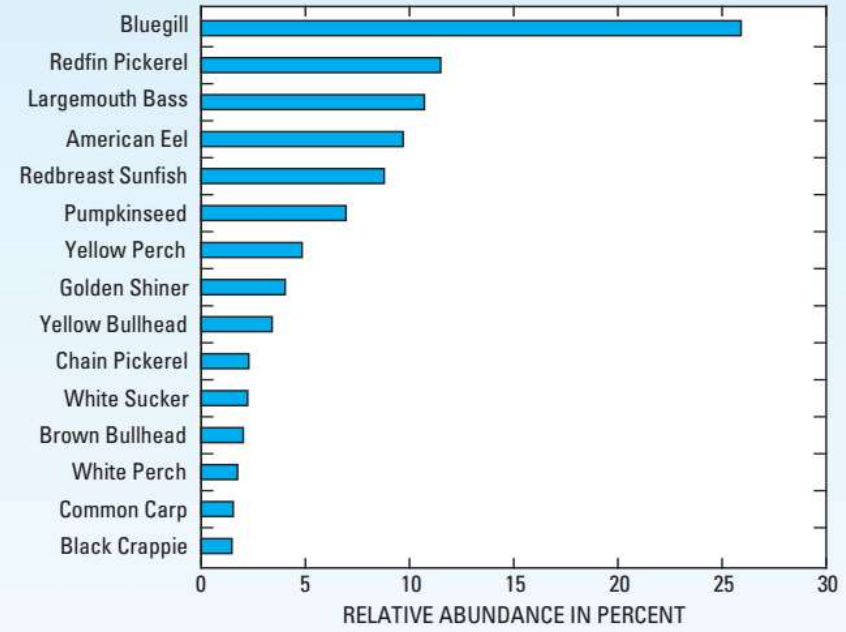
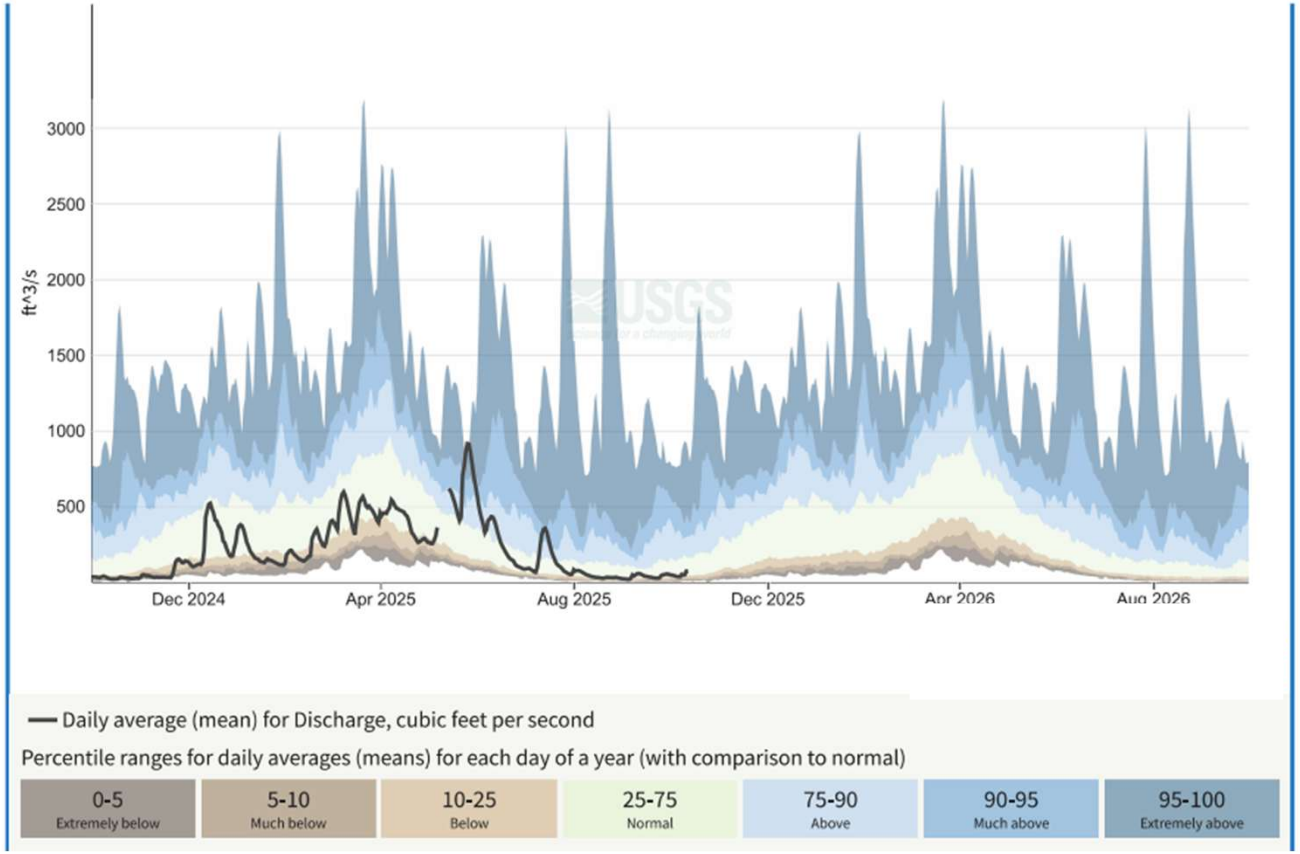


Figure 7. The 15 most common fish species in the mainstem Charles River and tributaries, on the basis of a sample of 3,320 fish collected in the summer of 2002 by CRWA and MDFG (written commun., 2005, Charles River Watershed Association and Massachusetts Department of Fish & Game).

Charles River Flow

- The state requires water restrictions below a minimum river flow of 62 cfs during July-Sept, for fish spawning, rearing and growth.
- Most summers this triggers Medfield water conservation requirements.
- The Charles and Neponset are fed by local streams, aquifers, and WWTP effluent.



Medfield Wells

- Medfield pumps water from 3 wells in the Charles River watershed and 2 wells in the Neponset River watershed.
- The wells are located within water-bearing sand and gravel aquifers adjacent to the Charles River and Mine Brook.
- The town wells are from 45 to 88 feet deep.
- The average aquifer withdrawal is 1.11 MGD distributed among houses and businesses.



Water Cycle

- 65% of total well water pumped is returned to the river as treated wastewater (annual average).
- 15% of total well water pumped returns to groundwater, mainly as septic system leachate.
- Most remaining water is evaporated.
- In summer, when usage rates are highest, 60% of the well water pumped is used for irrigation. Nearly all irrigation water evaporates during application or through evapotranspiration from plants.

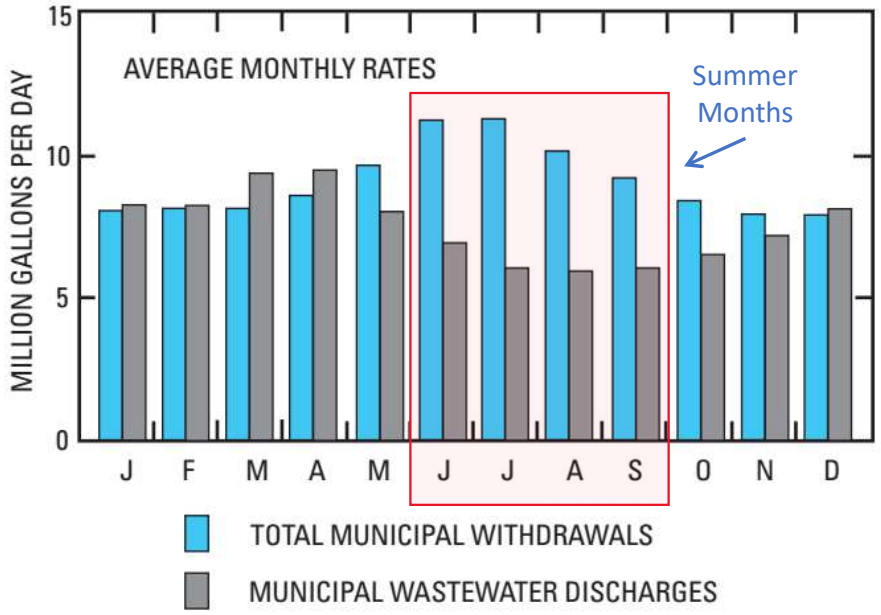
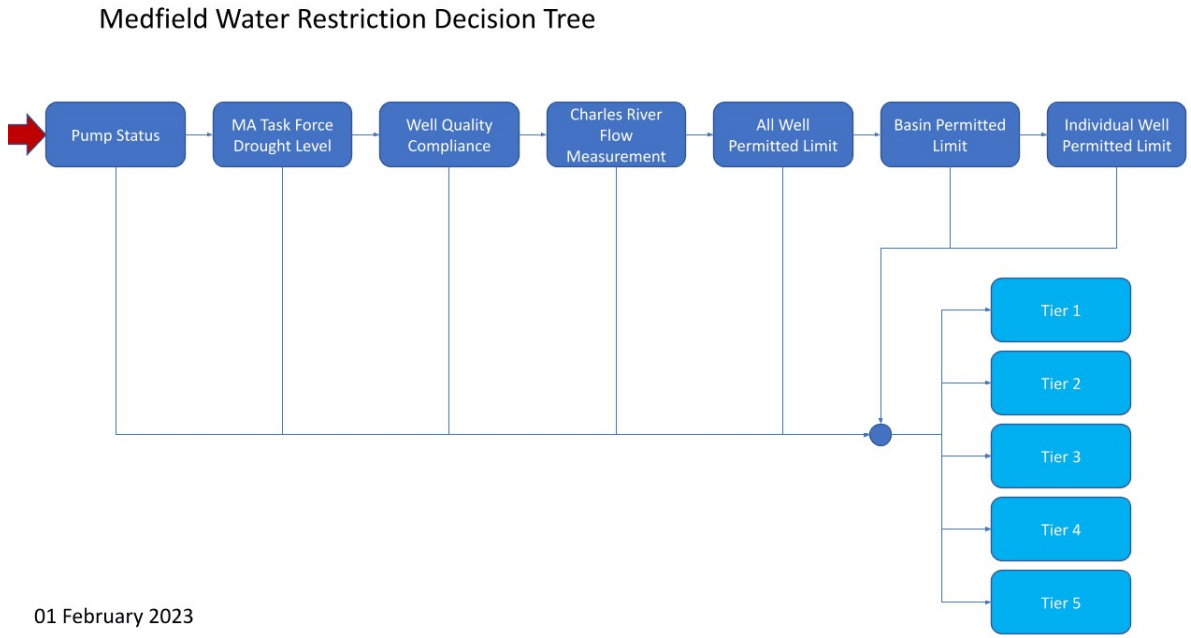


Figure 3. Average monthly municipal withdrawals and wastewater discharges in the upper Charles River watershed, eastern Massachusetts, 1989-98 (modified from DeSimone and others, 2002).

Decision Tree

- Water use restrictions stem from equipment issues that limit supply (this happened 12 years ago).
- They also can be triggered by low river water flow. (<170 cfs in May or June or <62 cfs in July, August, or September).



Private Wells

- 113 private wells based on state records or 2.6% of the total well water supply points.
- Average private well depth 580 ft; average public well depth 67 ft.
- Different depth and permeability/ hydraulic conductivity.

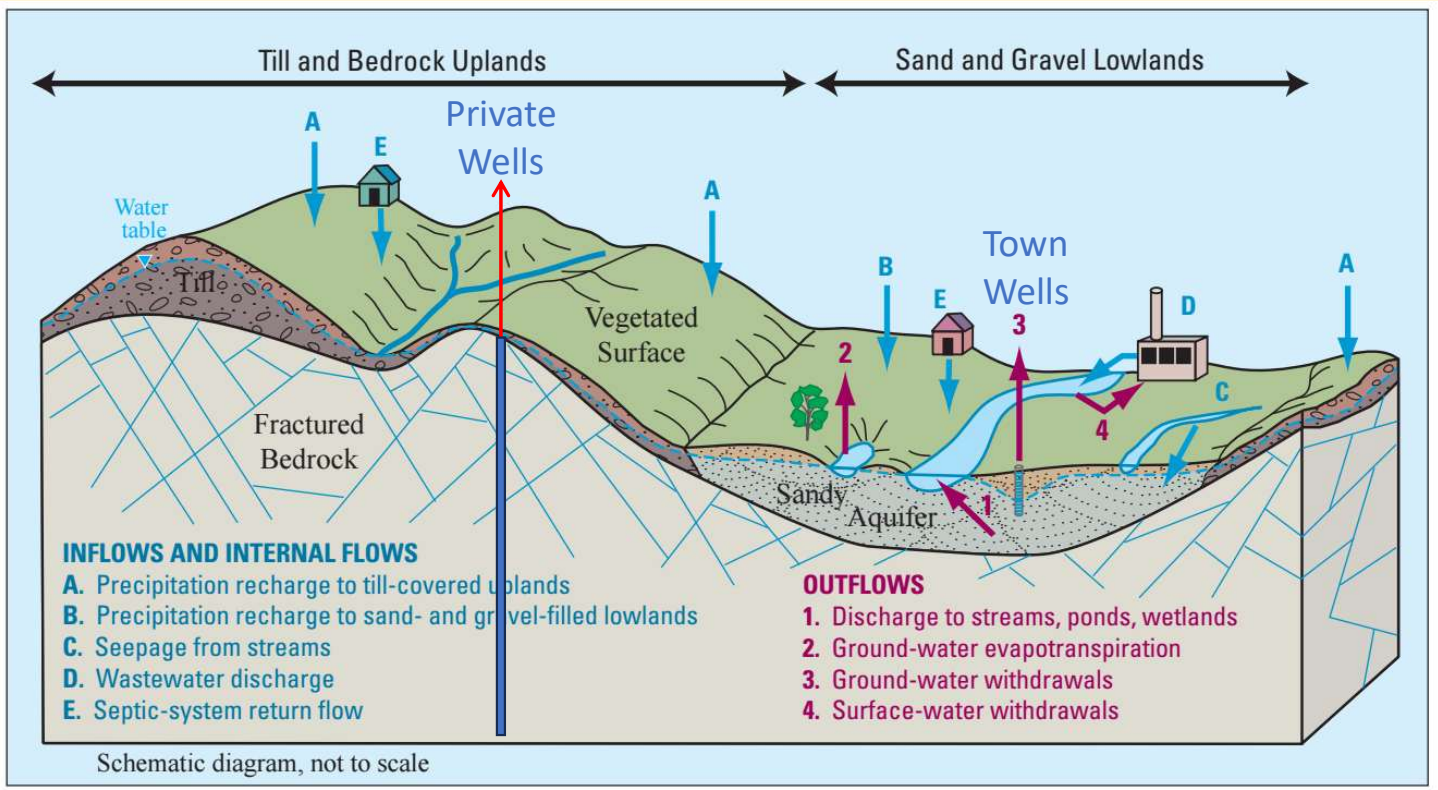


Figure 2. The water cycle of the upper Charles River watershed (modified from DeSimone and others, 2002 and Randall and others, 1988).

Private Well Flow Restrictions

- Historically, no limits on well production rates – the water beneath your lot is your property.
- State law does not restrict pumping rate; however, the state has provided language that could be used in local regulation.
- Needham, Groton, Canton prohibit installation of a private well on property where municipal water is available.
- Holliston BOH requests voluntary compliance by private well owners with restrictions on public water users.
- Burlington BOH may, at times, require private well owners to comply with public water use restrictions.