Identification and Removal of Migratory Obstructions

Who Could Benefit:
Region

Timeline:
Short Term

Category: Environmental

Brief Description

River herring populations are currently facing historical lows due to dam construction and operations, habitat loss, habitat degradation, and overfishing over the decades. While dams and new infrastructure significantly contribute to the decline of herring, other factors such as poor water quality and temperature changes linked to climate change also play crucial roles. This migratory species spends most of their lives in marine habitats but migrates into freshwater systems to spawn. River herring are culturally important to the Herring Pond Wampanoag Tribe. Herring not only serves as a form of sustenance for them, but their new year aligns with their life cycle. The new year begins in the spring, with the start of life when adult herring journey upstream to spawn.

Common barriers to the migration of diadromous species include dams and culverts. In some cases, a dam or culvert may no longer serve its intended purpose and can be removed to restore fish passage. When a barrier still fulfills a function, options like fish ladders can be constructed to assist fish in navigating these obstacles.

In the South Shore, many dams were built in the 1700s and 1800s to power small mills. Various government and non-profit organizations have been actively working to remove redundant or obsolete dams and restore herring habitats. One of the more complex restoration efforts in the OCPC area has focused on reconnecting fish to significant spawning and nursery habitats, such as the Monponsett Ponds in the Taunton River watershed and Silver Lake in the Jones River watershed. The fact that these and other water bodies also serve as drinking water sources for many communities contributes to the complexity of providing suitable ecological flows at the right times of year.

This Plan recommends that OCPC communities continue to integrate the removal of migratory obstacles into future planning and development projects and continue to work collaboratively with organizations like the North and South Rivers Association and the Jones River Watershed Association to effectively restore fish passage and enhance local ecosystems.

Environmental Considerations

It is important to note that restoring the habitat of one species may have detrimental impacts on the habitats of other species. Often, the goal of restoration is to return an area to “natural” conditions. However, if the area has developed under altered conditions for 100-200 years, drastic changes might prove harmful. Ecosystems are dynamic and may have adapted to these modifications, meaning that aggressive restoration efforts could displace established species or disrupt new ecological balances that have formed. Therefore, it is essential to consider the historical context and current ecological dynamics when planning restoration. Adaptive management strategies, which involve ongoing monitoring and flexibility, can help mitigate these risks, and engaging local communities can provide valuable insights and foster a more balanced approach to promoting biodiversity and ecosystem health.

Access to Clean Water for Private Well Owners – Education

Who Could Benefit:
Abington, Avon, Bridgewater, Brockton, Duxbury, East Bridgewater, Easton, Halifax, Hanover, Hanson, Kingston, Pembroke, Plymouth, Plympton, Stoughton, West Bridgewater, Whitman

Timeline:
Short Term

Category: Supply

Brief Description

This recommendation includes the development of educational materials for private well owners to be able to achieve access to clean water. Materials can provide steps for establishing a new well, permitting requirements, recommended laboratory testing, and other well maintenance recommendations. MassDEP currently offers many of these educational resources on their website[1]. This information can be consolidated for homeowners and can incorporate any additional requirements or recommendations from OCPC community Boards of Health. It is particularly recommended to include laboratory testing recommendations, including PFAS. Educational material options can include a webpage, and/or physical brochures.

Key Assumptions

It is assumed that one entity will need to take ownership of this effort creating the educational materials and distributing them to municipalities and/or directly to private well owners.

Risk Considerations

The removal of migratory obstructions could lead to negative impacts on earthworks. Concerns include potential erosion, loss of recreational opportunities, and the uncertain impacts on water supply and streamflow, which could hinder the ability to meet target flow requirements. Additionally, unintended consequences such as the introduction of new species or decreased property values resulting from dam removal could arise. Uncertainty about targets, patterns, or needs may also affect the success of this alternative.

Potential Actions

[This will be augmented by stakeholder input from Workshop 8]
Actionable work that could augment ongoing efforts and potentially garner funding support with the backing of this plan include:

- Prioritize the migratory impediments identified in the report / GIS layer submitted by Val Massard.
- Identify opportunity for augmented lake levels at Silver Lake based on potential offset from desalinated water use.
- Pursue updated feasibility study (natural hydrology and managed hydraulic flow pathways) and funding for potential fish ladder at Silver Lake that could require hydraulic modifications to the berm/dam

[1] https://www.mass.gov/private-wells

Identify Reservoir Management Strategies

Who Could Benefit:
The Region

Timeline:
Short Term

Category: Supply, Environmental

Brief Description

The goal of reservoir management for surface waters is to optimize the use of water stored in lakes and reservoirs by balancing multiple competing needs, including water supply, flood control, recreation, and environmental health. The two communities in the OCPC region who have surface reservoirs are Brockton and Abington.

Abington draws water from the Great Sandy Bottom Pond and Hingham Street Reservoir and the town may face challenges in meeting water demands by 2025 based on some projections (H2Olson 2022). Reservoir management strategies, which are being developed with the help of funding from the MassDEP (MassDEP 2023), can help optimize their water supply and ensure future needs are met.

Some of these strategies might include:

- **Optimal Reservoir Operations**: Timing water withdrawals between multiple reservoirs to maximize supply while minimizing environmental impact.
- **Trigger-Based Management**: Using reservoir levels as a trigger for operational decisions, such as when to increase or reduce water withdrawals.
- **Integrated Reservoir Modeling**: Abington is developing an integrated reservoir model to forecast supply and demand, helping the town plan for future needs by simulating different scenarios and management strategies.
- **Consider Climate Impacts**: Technical work supplementing the OCPC study is suggesting that natural water may be more plentiful in the future. Consider a vulnerability/opportunity study that could advise reservoir management decisions based on plausible or likely long-term climate trends.

Brockton's management of Silver Lake must balance ecological flow needs, water quality, and water supply. Several strategies have already been implemented, such as limiting diversions into Silver Lake from Monponsett Pond to the months of October through May to minimize nutrient influx and lake-level diversion restrictions. However, challenges remain, including ongoing water quality issues and low-flow conditions preventing juvenile herring from existing the lake. To improve the management of Silver Lake, it is recommended that Brockton evaluate this as part of their future Comprehensive Water Management Plan (CWMP). Here are several options that could be considered to further enhance reservoir management:

- **Coordinate Between Recommendations:** Other recommendations in this Plan support the study of ecological flow needs and the reduction of migratory impediments in the watersheds, both of which are directly related to reservoir management. Such tasks should be considered and executed in close coordination.

- **Divert Flood Waters**: Redirecting flood waters from Monponsett Pond to nearby wetlands could reduce the amount diverted into Silver Lake.
- **Pre-Treatment of Diversions**: Implementing pre-treatment measures for diversions from Monponsett into Silver Lake could reduce nutrient loading and improve water quality.
- **Limit Emergency Diversions**: Restricting emergency summer diversions into Silver Lake to 50% or less of capacity can help maintain water levels and reduce the impact on water quality.
- **Reduce Withdrawals**: Decreasing withdrawals from Silver Lake, either year-round or specifically during the summer months, can alleviate pressure on the reservoir and support ecological needs. This may only be possible with aggressive demand management and/or water offsets associated with more utilization of the desalination plant.

Risk Considerations

Reservoir Management may reduce the ability of communities to draw from their surface water source and therefore reduce reliability of that source. Some possible actions would require modifications to permits, physical modifications to existing infrastructure, and re-evaluation of supply reliability in balance with ecological needs.

References

H2Olson Engineering, Inc. 2022. Water Supply Assessment Memorandum.

Massachusetts Department of Environmental Protection (MassDEP). 2023. WMA Grant Award Letter.

Water Demand Offset Policies

Who Could Benefit:
All communities

Timeline:
Long Term

Category: Recommendation

Brief Description

This recommendation includes details on water demand offset policies, which focus on reducing water use from new development. Water demand offset policies require action on the part of developers to ensure that the new development does not result in an increase in overall water demands. There are various ways a municipality can design and implement a policy to achieve this. Some examples are outlined by AWE in *Water Offset Policies for Water-Neutral Community Growth: A Literature Review and Case Study Compilation* (Christiansen 2015). According to this literature review, the basic components of a water demand offset policy include:

- A condition that triggers the requirement for a water demand offset (e.g., new development and/or expanded use of an existing connection)
- Water demand projection of new development
- Methodology for estimating savings of on-site and off-site efficiency measures
- Water demand offset ratio (e.g., a ratio of 1:1 would require 100 percent of the projected demand to be offset, a ratio of 2:1 would require 200 percent of the projected demand to be offset)
- Demand mitigation implementation options, such as
    - On-site efficiency measures
    - Off-site efficiency measures
    - On-site recycled water use
    - Possible fee option in lieu of developer-implemented efficiency measures
- Administrative fees and other costs
- Verification of demands and implementation of efficiency measures
- A rule that ensures demand reductions are permanent

Some typical exemptions included for these water demand offset policies include public schools, municipal projects, and special permits. It is recommended that OCPC communities coordinate on these policies, including a provision that the bylaw not take effect until a certain number of other OCPC communities bylaws have also passed. This will allow for negative impacts, such as developers being concerned about coming into a community with restrictions that the neighboring communities doesn't have, to be mitigated.

Key Assumptions

Communities in the OCPC region would enact policies, passed by their selectboard, that would require water neutral new developments.

Examples of Related Policies Passed in Massachusetts

To support the development of language for water demand offset polies, CDM Smith has included examples of local bylaws and programs suggested or passed by other municipalities in Massachusetts. These can be used as guides for developing local ordinances in the OCPC Region.

- **Town of Ipswich MA, Model Water Use Mitigation Bylaw, October 2020.**[2]
  "An application concerning development within The Town of Ipswich that would use water from the Ipswich public water supply shall not be approved if the proposed development would increase water use on the property, unless the applicant offsets the requisite amount of water demand via one or more of the methods in this bylaw."

- **Town of Weymouth, Water Conservation Measures.**[3]
  "Any new water use applications issued by the Town are required to complete a 2:1 water savings ratio. These savings may be gained through the retrofitting of existing buildings with water savings devices. The retrofitting of all public buildings, schools, and some businesses and residences has been accomplished with the cooperation of the Town, new users, and contractors. These projects include the furnishing and installation of low flow toilets, low flow showerheads, low flow faucets, and low flow flushometers."

- **Town of Hingham MA, Water Balance Program**[4]
  "The Water Balance Program applies to all new and expanded water use projects, except (1) residential development with only a single service connection and (2) new and/or expanded water use developments that are expected to require less than 100,000 gallons per year of water. Applicants will have several options including:

  1. *Applicant-Directed Conservation – Applicant identifies and implements water conservation activities through retrofits approved by the Weir River Water System.*
  2. *Water Banking – Applicant provides funding for a Water Bank that will be used by the Weir River Water System to fund conservation efforts.*
  3. *Supplemental Source of Water Supply – (1) The Applicant identifies and develops a supplemental source of supply for the Weir River Water System and (2) the Applicant finances the development of a supplemental source of supply."*

Cost

Water demand offset policies effectively transfer the financial burden of sustainable water management from municipalities to developers and residents. By requiring developers to reduce projected water

[2] https://www.ipswichma.gov/DocumentCenter/View/12312/Water-Neutral-Growth-Plan---May-2020
[3] https://www.weymouth.ma.us/water-sewer/pages/water-system#:~:text=In%20the%20past%20several%20years,buildings%20with%20water%20savings%20devices.
[4] https://www.hingham-ma.gov/883/Water-Balance-Program

consumption or invest in demand offsets, these policies can lead to increased housing costs as developers factor in additional expenses.

Risk Considerations

While having an offset ratio greater than 1:1 will help ensure adequate savings are achieved to offset the demand of new developments, large ratios may make offsets exceedingly difficult to realize as time goes on due to an accelerated reduction of the installed base of inefficient fixtures. In addition to an adequate offset ratio, it is also important to ensure that the off-site and on-site water efficiency measures are permanent. Water demand offset policies should be formulated in a way that they can be easily modified to adapt to new opportunities and challenges in the future.

References

Christiansen, Bill. 2015. *Water Offset Policies for Water-Neutral Community Growth: A Literature Review and Case Study Compilation.* Alliance for Water Efficiency.

Private Well Outdoor Water Use Restrictions Local Bylaws

Who Could Benefit:
Abington, Avon, Bridgewater, Brockton, Duxbury, East Bridgewater, Easton, Halifax, Hanover, Hanson, Kingston, Pembroke, Plymouth, Plympton, Stoughton, West Bridgewater, Whitman

Timeline:
Long Term

Category: Demand
Brief Description

This recommendation seeks to enhance conservation efforts by implementing local bylaws that limit nonessential water use from private wells, specifically during drought conditions. This will encourage sustainable water use and standard restrictions across properties who are on private wells versus on public water supply.

Key Assumptions

Towns in the OCPC region could implement bylaws that impose restrictions on water use from private wells during drought periods, with the expectation that private well owners will adhere to these regulations.

Examples of Related Bylaws Passed in New England

To support the development of language for local private well use restriction bylaws, CDM Smith has included examples of local bylaws passed by other municipalities in Massachusetts. These can be used as guides for developing local ordinances in the OCPC Region.

- **Stow Massachusetts, Stow Board of Health, Outdoor Water Use Restrictions for Private Wells (DRAFT)** [1]
  "During a Drought Condition affecting any area or region of which the Town of Stow is a part, as declared the Secretary, nonessential water use shall be limited as set forth in the Table below. Notwithstanding any action or in-action by the Secretary, the Board of Health may declare a Drought Condition for the Town of Stow and establish limitations on nonessential water use; provided that any restrictions on nonessential water use declared by the Board shall be at least as restrictive (but may be more restrictive) as the restrictions mandated by the Secretary."

  The referenced table in this ordinance is included in **Table 1**.

Table 1: State Guidance on Nonessential Outdoor Water-Use Restrictions at Various Drought Levels

State Drought Condition (by Region)	Nonessential Outdoor Water-Use Restrictions
Level 1 (Mild Drought)	1 day per week watering, after 5 p.m. or before 9 a.m. (to minimize evaporative losses)
Level 2 (Significant Drought)	Limit outdoor watering to hand-held hoses or watering cans, to be used only after 5 p.m. or before 9 a.m.
Level 3 (Critical Drought)	Ban on all nonessential outdoor water use

[1] https://www.stow-ma.gov/sites/g/files/vyhlif11851/f/news/boh_outdoor_use_restrictions_for_private_wells_draft.pdf

Level 4 (Emergency Drought)	Ban on all nonessential outdoor water use

- **Ipswich Massachusetts, Town of Ipswich, Article II Outdoor Water Use[2]**
  "All users of the public water supply system and users of private water sources, exclusive of stormwater harvested and stored in tanks or cisterns, shall be subject to this bylaw. The Town, through its Board of Water Commissioners or its designee authorized to act as such, may restrict or ban the use of water as set forth in Article I, Section 7 of the Water Rules, and Regulations. Upon notification to the public that water use is being restricted or banned, no person shall violate any provision, restriction, requirement, or condition of the declaration. The Water Commissioners may designate the Water Director or Town Manager to declare a Restriction or Ban of Water Use at any time that conditions warrant. Public notice of a Restriction or Ban of Water Use shall be given under § 220-8 (a) of this bylaw before it may be enforced."

Environmental Considerations

This recommendation may affect the health of lawns for private well owners. However, in similar bylaws, nonessential water use typically allows for irrigation as needed to maintain lawn health, except during periods of critical drought. Restricting outdoor water use during times of drought may allow for more water to support in stream flows to support ecosystem health.

Risk Considerations

Restrictions may adversely impact local businesses that depend on water-intensive practices, potentially resulting in economic difficulties. Additionally, ensuring compliance among residents could prove challenging, leading to inconsistent adherence across communities.

[2] https://www.ipswichma.gov/DocumentCenter/View/9576/Water-Restriction-By-Law-ADOPTED-MAY-2017

Water Use Mitigation Program

Category: Recommendation

Brief Description

One specific type of water demand offset policy is a Water Use Mitigation Program. With a WUMP, also known as a water bank, the community collects a fee for each new development which must exclusively be used for conserving water resources, reducing demand upon the public water supply, and/or water use mitigation.

A water bank is technically defined in the 2018 Massachusetts Water Conservation Standards as "… a system of accounting and paying for measures that offset existing water use or mitigate water losses. The primary goals of a water bank are to offset the impacts of new demand to help pay for measures that balance the water budget, reduce water losses, increase water efficiency, reduce discretionary water use and keep water local" (EEA and MWRC 2018). MassDEP has the authority to require a WUMP (MassDEP 2023).

Under a typical WUMP, the water supplier is responsible for the administration and execution of water mitigation projects in addition to soliciting residents to identify interest in water saving devices and appliances at reduced cost. The funds collected can also be used on water conservation education or to defray salary and administration costs.

The adoption of this program is especially recommended for communities who are anticipating substantial future development and are concerned about being able to meet increased drinking water demands.

Applicability

The WUMP program is applicable to projects that fall under one or more of the following categories:

- Projects which require a building permit
- Project which represents a new or increased water demand
- Residential project of (3) or more dwelling units
- All commercial projects

Examples of Related Programs Passed in Massachusetts

To support the development of a WUMP, CDM Smith has included examples of local WUMPs fee structures adopted by other municipalities in Massachusetts. These can be used as guides for developing local WUMP's in the OCPC Region.

- **Town of Danvers**[3]
  "The Danvers WUMP has been implemented in according with requirements set forth by the MassDEP in the Town's WMA Permit. The Town of Danvers is required to collect a fee to fund

[3] https://www.danversma.gov/DocumentCenter/View/468/Water-Use-Mitigation-Program-Policy-PDF

waster savings projects sufficient to mitigate new water demand by a 2:1 rate." Danvers' example fee structure outlined in **Table 2.**

Table 2: Town of Danvers Water Use Mitigation Charges

Development Type	Fee
Residential – 1 Bedroom	$ 1,980/unit
Residential – 2 Bedroom	$ 3,960/unit
Residential – 3 Bedroom	$ 5,940/unit
Residential – 4 Bedroom	$ 7,920/unit
Commercial and Industrial	$9.00/gpd (Gallon per day volume defined per Title 5)

- **Town of Ipswich**[4]
  "*The following Water Use Mitigation Program (WUMP) is implemented to mitigate water demand of new developments to minimize impacts to the water system. The funds collected through this program will fund water saving projects to enable the public water system to meet the additional demand."* Ipswich's example fee structure outlined in **Table 3**.

Table 3: Town of Ipswich Water Use Mitigation Charges

Development Type	Fee
Residential	$ 1,500/Bedroom
Non-Residential	$ 13.50/gpd (Gallon per day volume defined per Title 5)

- **Town of Wenham**[5]
  "*The Wenham Water Use Mitigation Program [WUMP] has been implemented to collect a fee to fund water savings projects to mitigate new water demand."* Wenham's example fee structure outlined in **Table 4.**

Table 4: Town of Wenham Water Use Mitigation Charges

Development Type	Fee
Residential – 1 Bedroom	$ 550/unit
Residential – 2 Bedroom	$ 1,100/unit
Residential – 3 Bedroom	$ 1,650/unit
Residential – 4 Bedroom	$ 2,200/unit
Commercial and Industrial	$5.5/gpd/unit (Gallon per day volume defined per Title 5)

Cost

[4] https://www.ipswichma.gov/DocumentCenter/View/12583/Interim-Water-Use-Mitigation-Program-ADOPTED-10-5-20
[5] https://cms4files1.revize.com/wenhamma/WUMP_Policy%203.26.19.pdf

WUMPs effectively shift the financial responsibility for sustainable water management from municipalities to developers and residents. By requiring developers pay a fee based on projected water demand, these programs can result in higher housing costs as developers incorporate these additional expenses into their pricing.

References

Massachusetts Department of Environmental Protection (MassDEP). 2023. *310 CMR 36.00: The Water Management Act Regulations*. Mass.gov

Massachusetts Executive Office of Energy and Environmental Affairs (EEA) and Water Resources Commission (MWRC). 2018. *Massachusetts Water Conservation Standards*. Mass.gov

Inter-Municipal Agreements

Category: Recommendation

Brief Description

An Inter-Municipal Agreement (IMA) is a collaboration contract between two or more municipalities that unites them towards a common goal and designates duties to each other. IMAs can be a solution to water and/or sewer problems with one or more neighboring communities. There are three basic types of inter-municipal agreements:

- **Formal Contracts:** written contract under which one local government agrees to provide a service to another local government for an agreed-upon price.
- **Join Service Agreement**: two or more municipalities agree to join forces to plan, finance, and deliver a service within the boundaries of all participating jurisdictions.
- **Service Exchange**: an arrangement where participating jurisdictions agree to lend services to one another, generally without any payment required. The most common example is mutual aid for emergency services.

This recommendation will focus on providing examples of formal contracts, as they are the most common type of IMA. Examples of IMA's for the sharing of water and sewer services between neighboring towns in Massachusetts are listed in **Table 5**. For best practices on creating an IMA, additional resources are available on Mass.gov [6].

Table 5: Examples of Water and Sewer IMA's in MA

IMA Service	Between	Footnote
Wastewater Collection and Treatment	Towns of Chatham and Harwich Towns of Ayer and Groton City of New Bedford and Town of Freetown	7 8 9
Water Service	City of Leominster and County of Worcester Towns of Andover and North Reading Towns of Foxborough and Mansfield	10 11 12
Water and Sewer	Towns of Mansfield and Norton	13

[6] https://www.mass.gov/doc/best-practices-of-inter-municipal-agreements-mcwt/download
[7] https://www.chatham-ma.gov/DocumentCenter/View/812/Chatham-Harwich-Intermunicipal-Agreement-for-Wastewater-Collection-and-Treatment-Effective-Date-June-20-2017-PDF
[8] https://www.ayer.ma.us/sites/g/files/vyhlif2756/f/uploads/170428_dpw_wastewater_intermunicipal_agreement_with_groton.pdf
[9] https://cms2.revize.com/revize/fallriver/City%20Council%20Agendas/2016/November-22-2016-agenda-packet.pdf
[10] https://www.ci.lancaster.ma.us/sites/g/files/vyhlif4586/f/uploads/attachment_7-1b_infrastructure_-_executed_intermunicipal_agreement_between_leominster_lancaster_for_water_service.pdf
[11] https://andoverma.gov/DocumentCenter/View/4856/2018-5-30_Final-IMA-North-Reading-Water
[12] https://www.mansfieldma.com/DocumentCenter/View/7624/32223-TOM-Foxborough-Water-IMA-Intermunicipal-Agreement-PDF
[13] https://www.mansfieldma.com/DocumentCenter/View/7625/51123-TOM-Norton-Water-IMA-Intermunicipal-Agreement-PDF

Ecosystem Assessment and Ecological Flow Needs

Who Could Benefit:
Region

Timeline:
Short Term

Category: Environmental

Brief Description

Ecosystem assessment can take many forms, but it most commonly involves documenting factors that affect the health and functioning of natural ecosystems. This includes examining land use changes, water quality, habitat fragmentation, the spread of invasive species, and biodiversity levels. These assessments provide a comprehensive overview of the ecosystem's current state, enabling conservationists to identify key threats and prioritize areas for intervention. By evaluating these factors, ecosystem assessments are critical for targeting conservation efforts, setting goals for ecosystem health, and ensuring the resilience of natural systems in the face of environmental change.

One important metric derived from an ecosystem assessment is ecological flow need (EFN). EFN refers to the amount, quality, and timing of water flows necessary to sustain the health of river ecosystems while also supporting sustainable human development. Understanding EFN is crucial for maintaining biodiversity, as many aquatic and riparian species rely on specific flow conditions for breeding, feeding, and habitat stability. In the Jones River, river herring populations should be considered.

Numerous approaches have been developed to define ENF for specific watersheds and regions across multiple spatial scales, often involving hydrological modeling, ecological studies, and stakeholder engagement to ensure that the needs of both ecosystems and communities are addressed. The Massachusetts Department of Conservation and Recreation (DCR) reviewed various standard-setting instream flow methods and created their own Index Streamflow Statistics to represent the characteristics of natural streamflow in Massachusetts (DCR, 2008). The Index Streamflow documentation presents three different sets of statistics for benchmarking streamflow:

1. **Annual Target Hydrograph:** This method uses monthly quartile flows to describe natural flow patterns throughout the year, serving as a standard for managing streamflow in the absence of site-specific data.
2. **Aquatic Base Flow (ABF) Approach**: This method focuses on the median of monthly mean flows, providing a critical benchmark for low-flow conditions necessary to sustain aquatic habitats.
3. **Indicators of Hydrologic Alteration (IHA) Statistics**: This group of statistics represents various aspects of streamflow, including magnitude, duration, frequency, and rate of change, helping to identify deviations from natural flow regimes.

In addition to the Index Streamflow Statistics, MassDEP partnered with the U.S Geological Survey (USGS) to develop the Massachusetts Sustainable-Yield Estimator (MASYE)[1]. MAYSE is a planning-level decision-support tool designed to help decision makers estimate daily mean streamflow and selected streamflow statistics that can be used to assess sustainable water use at ungaged sites in Massachusetts.

[1] https://www.usgs.gov/software/massachusetts-sustainable-yield-estimator-masye-application-software-version-20

Environmental Considerations

Setting flow targets for altered rivers and streams is challenging because restoring natural flow might harm local species that have adjusted to changed conditions. It's important to consider the historical context and current ecological dynamics when making decisions about stream flow.

Risk Considerations

Climate change, regulations, or other factors may make it unfeasible to achieve ecological flow needs. Furthermore, different species may have conflicting ecological needs.

References

DCR. 2008. *2008 Index Streamflows for Massachusetts*. Massachusetts Department of Conservation and Recreation (DCR), Office of Water Resources.

Native Landscaping Local Bylaws

Category: Environmental

Brief Description

Who Could Benefit:
Abington, Avon, Bridgewater, Brockton, Duxbury, East Bridgewater, Easton, Halifax, Hanover, Hanson, Kingston, Pembroke, Plymouth, Plympton, Stoughton, West Bridgewater, Whitman

Timeline:
Long Term

Potential Water Savings and Co-benefits

This recommendation seeks to support reimplementation of plantings native to the Northeast in new development and municipal owned properties. Plants native to the region have adapted to local climate conditions and require less water than nonnative plants. Native landscaping has many additional co-benefits, such as requiring less fertilizer which helps reduce impacts to water quality, storing water in deep root systems which helps reduce runoff and control erosion, maintaining native biodiversity, providing habitat for birds and other animals.

Key Assumptions

Towns in the OCPC region would enact bylaws, passed by their selectboard, that would require native landscaping to be implemented on newly developed properties and when plantings are replaced on municipal owned properties.

Examples of Related Bylaws Passed in New England

To support with the development of language for local native landscaping bylaws, CDM Smith has included examples of local bylaws passed by other municipalities in New England. These can be used as guides for developing local ordinances in the OCPC Region.

- **Somerville Massachusetts, City of Somerville Ordinance No. 2021-05, March 2021**[2]
  "All new plantings shall consist of native plants only in Riparian areas, The community path, The green line extension rail corridor, bioswales, plaza's, streetscapes, and other city-owned properties. A minimum of 75% native plantings in parks. A minimum of 50% native street trees planted by the city each year to increase in subsequent years."

- **Ridgefield Connecticut, Town of Ridgefield Policy on the Use of Native Plants on Town- Owned Property, September 2022**[3]
  "100% of new and replacement trees, shrubs, herbaceous perennials, and ground cover plantings on municipal properties will be native to the Northeast. The policy also applies to any replacement plantings, including but not limited to trees, shrubs, and perennials felled by storms, disease, redevelopment/expansion, or other reasons. The policy also applies to seeds used in place of plants."

[2] https://s3.amazonaws.com/somervillema-live/s3fs-public/native-planting-ordinance.pdf
[3] https://www.pollinator-pathway.org/_files/ugd/7bd21d_26e9150df13e4b5387e0cf869eb23004.pdf

- **Newtown Connecticut, Town of Newtown, Text Amendments to Town of Newtown Zoning Regulations - Article VIII Supplemental Regulations, Section 4 - Landscape, Screening and Buffer Requirements, December 2021**[4]

  "A minimum standard requirement for all new plantings of trees, shrubs and other plants on municipal properties. It also applies to seeds used in place of plants. The policy applies to any replacement plantings, including but not limited to trees, shrubs, and perennials felled by storms, disease, redevelopment/expansion, or other reasons. New and replacement plantings for trees, grasses and ground covers must be 100% native. New and replacement plantings of shrubs must be 85% native. New and replacement plantings of herbaceous perennials must by 75% native."

It is important to note that these ordinances had specific exceptions, such as growing food in gardens and green roofs. These exceptions should be carried forward into local bylaws in the OCPC region, to support other work related to food resilience OCPC is pursuing.

Cost

CDM Smith has not developed costs for this recommendation. It should be noted that there may be increased landscaping costs for new development and for municipalities when replanting landscaping.

Risk Considerations

Local landscaping companies may not have the skillset required to source, plant, or care for native plants. Local plant nurseries may not

[4] https://www.pollinator-pathway.org/_files/ugd/110149_94878021d2224a378060b110694d158a.pdf

Requiring Water Quality Tests of Private Wells Bylaw

Who Could Benefit:
Abington, Avon, Bridgewater, Brockton, Duxbury, East Bridgewater, Easton, Halifax, Hanover, Hanson, Kingston, Pembroke, Plymouth, Stoughton, West Bridgewater, Whitman

Timeline:
Long Term

Category: Supply

Brief Description

This recommendation would require that property owners with private wells who are in the process of selling their property should be required to conduct water quality testing on their wells prior to the sale. The water quality test must include PFAS and if the testing reveals any levels of PFAS contamination that exceed EPA/MassDEP standards, the responsibility will fall on the seller to take appropriate action to address and treat the contamination before finalizing the sale of the property. This would ensure that buyers are not inheriting potential health risks or liabilities related to water quality.

Key Assumptions

Towns in the OCPC region could enact bylaws that mandate water quality testing for private wells prior to the sale of a home.

Examples of Related Bylaws Passed in New England

- **Harvard Massachusetts, Harvard Board of Health, Testing and Treating your private well for PFAS in the Town of Harvard**[5]
  "The Harvard Board of Health (BoH) regulations prescribe testing for specific water quality parameters. These regulations apply to new wells and to existing wells on properties when they are being transferred (sold). The Board of Health's regulations require the well on the property being transferred to be tested within 12 months prior to the transfer of the house. The Board of Health requires PFAS testing of drinking water on certain streets where PFAS chemicals have been found. If your house is on one of these streets, in addition to the standard water quality tests, a PFAS test is required."

- **Stowe Massachusetts, Town of Stow Board of Health, Private Well Regulations**[6]
  "The Board recommends that prior to selling, conveying, or transferring title to real property, the owner (or prospective buyer) have a sample of the water of every private drinking water well serving that property collected and tested by a certified laboratory using the parameters listed in the Water Quality section of this document [Section5.6(3)]. The Board also requests that results of the water quality testing be submitted to the Board prior to property transfer or the start of construction. It is recommended that the owner give copies of all available water quality test

[5] https://www.harvard-ma.gov/sites/g/files/vyhlif676/f/uploads/guidance_testing_and_treating_pfas_in_harvard.pdf#:~:text=The%20Board%20of%20Health%E2%80%99s%20regulations%20require%20the%20well,months%20prior%20to%20the%20transfer%20of%20the%20house

[6] https://www.stow-ma.gov/sites/g/files/vyhlif11851/f/uploads/town_of_stow_private_well_regulations5-21-2015.pdf

results of which he/she has knowledge (regardless of age of results) for the well in question to any buyer and/or broker involved in the transfer."

Environmental Considerations

Water quality testing of private wells can help detect PFAS and other potential contaminants and prompt necessary actions to address and remediate pollution, ultimately protecting public health by ensuring safe drinking water in private wells.

Risk Considerations

Water quality testing can be costly for the well owner and may pose a financial risk to some.

Conduct Regular Rate Studies

Category: Demand

Brief Description

When establishing water rates, there are several objectives to consider, such as generating income, ensuring fair cost distribution among customers, maintaining the affordability of water for essential needs, and promoting efficient use and conservation of water.

According to a 2017 survey given by the Massachusetts DCR and Divisions of Ecological Restoration (DER), the most common reasons water suppliers cited for rate revisions was to increase revenue to meet operating costs, increase revenue to address long-term capital needs, and improving revenue stability. The most common obstacles cited were the lack of support from ratepayers and lack of political will from town officials.

Rate should be reviewed frequently and adjusted as needed to ensure revenue adequate to sustain operations and finance system expansion and upgrade, as well as distribute costs equitably.

To effectively sustain operations, finance system expansion, and upgrade infrastructure, water rates should be reviewed and adjusted frequently. AWE and its partners offer resources for developing, evaluating, and implementing effective rate structures. Notable materials include the handbook *Building Better Water Rates for an Uncertain World*[7], and the *Sales Forecasting and Rate Model Analytical Tool*[8]. Additionally, the American Water Works Association provides valuable guidelines through resources like *M1 Principles of Water Rates, Fees and Charges*[9] and *M54 Developing Rates for Small Systems*[10].

Rate Structures for Conservation and Affordability

Incorporating conservation incentives into rate structures can encourage responsible water use. Several approaches include:

- **Seasonal Rates**: Higher unit charges during peak demand seasons.
- **Increasing Tiered or Block Rates**: Charges increase as usage crosses predetermined thresholds.
- **Sliding Scale**: Prices rise based on average daily consumption.
- **Drought or Scarcity Rates**: Increased charges triggered by drought indicators or resource stress.
- **Excess Use Charges**: Significantly higher rates for usage above average, typically determined by winter consumption.
- **Indoor/Outdoor Rates**: Lower rates for indoor usage compared to outdoor usage.
- **Spatial Pricing**: Costs reflect the actual supply cost to discourage new or challenging connections.
- **Water Budgeting**: Households receive a "water budget" based on anticipated needs, considering factors like household size or property dimensions.

[7] https://www.allianceforwaterefficiency.org/sites/default/files/assets/AWE_Building%20Better%20Water%20Rates%20for%20an%20Uncertain%20World_Final_0.pdf
[8] https://www.allianceforwaterefficiency.org/resources/financing-sustainable-water/sales-forecasting-and-rate-model
[9] https://store.awwa.org/M1-Principles-of-Water-Rates-Fees-and-Charges-Seventh-Edition
[10] https://store.awwa.org/M54-Developing-Rates-for-Small-Systems-Second-Edition

To enhance affordability, especially for low-income customers, various support mechanisms can be integrated:

- **Income-Based Discounts**: 'Lifeline' rates that ensure essential water needs are met at reduced costs.
- **Senior or Disabled Discounts**: Targeted discounts for vulnerable populations.

Nine of the OCPC communities have revised their rates within the last three years. Several of these communities are implementing incremental rate increases over the next few years to effectively manage rising costs. It is strongly recommended that all communities continue to conduct rate studies periodically, particularly in response to unexpected capital expenses.

Cost

American Water Works Association has a Rate Survey subscription that costs $199 for non-members.[11]

[11] https://www.awwa.org/data-products/rate-survey/