

Energy and Climate Action Committee Stormwater Working Group Minutes

Meeting Date: 1/5/23

Working Group Members: Miriam DeFant, Zoe Weizenbaum, Michael DeChiara (absent)

Others: MaryJo Johnson

The Working Group discussed how stormwater management relates to Town climate resilience and brainstormed project ideas.

Stormwater Management Priorities and Big-Picture Themes

Overview: Stormwater management is an identified high priority in both the MVP and the HMP (Hazard Mitigation Plan). Extreme weather and storm events can create flooding and erosion hazards in hilly, riverine areas like Shutesbury. Stormwater levels are expected to increase with more extreme weather events and climate change. Stormwater contains sediments and vehicle contaminants that enter wetlands, streams, groundwater, and drinking water (private wells, Quabbin Reservoir, Atkins Reservoir, etc.). Septic systems and homes are also at risk when stormwater flooding occurs. Excessive flooding damages roads and transportation infrastructure, costing the Town in resources to repair roads, culverts, etc.

Nature-Based Solutions

Nature-based Solutions (NbS) are a top priority with the Stormwater Working Group (SWG). For stormwater management, NbS includes practices and designs that incorporate natural features or processes into the built environment to address climate change, flooding, water quality, wetlands protection, and property/infrastructure protection.

Nature-based Solutions to stormwater management involves infrastructure practices that use natural or biological processes to control water runoff volume and treat runoff (e.g., filter out sediments and contaminants). These often simple approaches have benefits in terms of often superior performance, lower cost, aesthetics, and wildlife habitat protection.

Problem Areas

Culverts: Culverts, where wetlands and stormwater channels cross under roads, are particularly vulnerable to storm events that result in flooding and erosion. Culverts that are in poor conditions or are undersized can become blocked by sediments and debris. Because Shutesbury is a hilltown with many wetlands, our Town roads have dozens, if not hundreds, of culverts. Many stream crossings are aging and have not been thoroughly inventoried and evaluated. Blocked, collapsed, or undersized culverts make the Town vulnerable to extreme weather events and flooding, putting transportation, emergency access, and homes at risk. The Town needs a comprehensive survey of all culverts on Town roads, with an assessment and prioritization of which ones need

repair or upgrades. There are also problem spots where wetland seeps in the road create frost heaves and potholes.

Right-of-Way Swales and Basins: Roadside swales (ditches) and drainpipes in the Town-owned Right-of-Way (ROW) direct stormwater downhill to environmentally sensitive areas. There are also many aging, buried drainpipes running parallel on the edges of Town roads in the ROW. Dirt roads rely on swales and unvegetated “country drainage” basins for stormwater, but these features continually erode and silt up, requiring ongoing maintenance. In many parts of dirt roads, “entrenchment” has developed where stormwater is concentrated because the road is much lower than the ROW and there is no room for drainage. Some areas don’t have two full travel lanes (e.g., Wendell Road and Pratt Corner Road). Corrections for entrenched roads are often not feasible. While Town roads use many stormwater features, the Town does not utilize NbS such as bioswales, rain gardens, etc.

Homeowners and Driveways: The intersection between Town roads and driveways can exacerbate stormwater problems. The Town lacks effective regulatory mechanisms for evaluating how driveways, including changes to driveways (such as paving or “berming”) affect road stormwater management. Homeowners often lack necessary information about how to incorporate eco-friendly, NbS principles into landscaping for stormwater management.

Lake Wyola District: The Lake Wyola District is a priority area due to the topography, the population density, and the environmental sensitivity of the lake. Planning problems include the dense settlement and the many privately-owned unpaved roads. Sediment and phosphorus contamination in the lake are concerns. Stormwater flooding also puts drinking wells and septic systems at risk.

Beavers: An established beaver population in the Lake Wyola watershed leads to beaver-human interactions and concerns about the impact of beaver on infrastructure. Mary Jo Johnson shared a number of resources and research that discuss how beaver communities can provide NbS stormwater resilience by enhancing wetland habitat and controlling flooding. The Town lacks to financial resources to develop a proactive approach to beaver management. MaryJo Johnson has been researching non-lethal approaches to beaver management and the benefits of beavers for water quality and stormwater management. She has shared a number of useful resources. DeFant shared information about an upcoming webinar through the Massachusetts Association of Conservation Commissions (1/18/23) on beavers and climate resilience.

Lake Wyola Dam: The Lake Wyola Dam needs repairs. The dam, while not a NbS, is important for stormwater management. MVP does not fund dam repairs because this is considered a maintenance issue, but exploration of other grant sources for the repairs makes sense. The Mass Dam and Seawall Program funds dam repairs.

Project Ideas for further research:

The working group discussed possible projects that could be either pursued separately or bundled together. Development of these ideas requires input from the Select Board, Town Administrator,

Highway Department, Board of Health, Conservation Commission, LWAC, and other stakeholders.

- 1. Stream Crossing Survey and Technical Assessment (See Uxbridge and Belchertown examples):** evaluation could include developing a comprehensive inventory that describes each culvert or stream crossing, and evaluates it in terms of condition, sizing, storm resilience, and aquatic organism connectivity, among other factors. Goal would be to assist Town in prioritizing actions and streamline repairs/replacements. MVP and the Compact Communities Program fund these types of assessments. The Working Group discussed this type of assessment being a high priority.
- 2. Nature-Based Solutions for Beaver Management:** assessment of a selected number of stream crossings where beaver/infrastructure interactions occur, with design of appropriate beaver management devices to match each location. Many residents have voiced a desire to see the Town develop proactive and non-lethal approaches to beaver management.
- 3. Lake Wyola:** FRCOG is working on a Watershed-Based Plan for Lake Wyola that could be used to develop future MassDEP grant applications for stormwater engineering and construction (§604b Water Quality Management Planning Grants; §319 Nonpoint Source Competitive Grants). Some engineering assessments have already been conducted, and the Sawmill River culvert is slated for replacement this year. A more limited action plan could look to address identified flooding hazards in specific areas. LWAC is likely to support efforts in this area.
- 4. Public Education:** public education and engagement programming on how to use Nature-Based Solutions and bioretention stormwater methods in landscaping and driveway design (e.g., “Use of Native Plants for Stormwater Management”, “How to Construct a Rain Garden”, “Vegetated Buffer Strips in Lakeshore Landscaping”, “Homeowner’s Guide to Stormwater Management”).
- 5. Nature-Based Solutions Demonstration Projects:** Identify a small number of high-impact stormwater areas in Shutesbury to design and build bioretention basins or rain gardens.
- 6. Culvert Replacements:** There are a number of grant resources for culvert replacements, including MVP, MassDOT, and the Mass DER Culvert Replacement Municipal Assistance Grant Program. Culverts need to be permitted and engineered to meet state regulations.

Meeting adjourned at 2:36 p.m.

Respectfully submitted by Miriam DeFant, 1/8/23

Documents:

Shutesbury Culverts; Stormwater Resource List (attached)

Resources for Further Research

Lake Wyola Advisory Committee (LWAC) has links on its homepage to stormwater assessments for the Lake Wyola watershed. A stormwater engineering analysis was conducted by DCR in 2007.

See https://www.shutesbury.org/lake_wyola_advisory_committee

Conservation Commission homepage has links with best practices for homeowners, including native gardening, rain garden design, erosion controls and ecological lakeshore landscaping. [shutesbury.org/concom_resources](https://www.shutesbury.org/concom_resources)

[Nature-Based Solutions \(resilientma.mass.gov\)](https://resilientma.mass.gov)

River Smart Communities, an environmental education program sponsored by UMass (<https://extension.umass.edu/riversmart/about-riversmart-communities>).

- [*Building Community Resilience with Nature-Based Solutions: a guide for local communities, FEMA*](#)

[Nature-based Stormwater Strategies to Reduce Flooding and Improve Water Quality in N.C.](#)

[Vermont Lake Wise Lakeshore Management](#)

[Lake Superior Streams Tools for Stormwater Management](#)