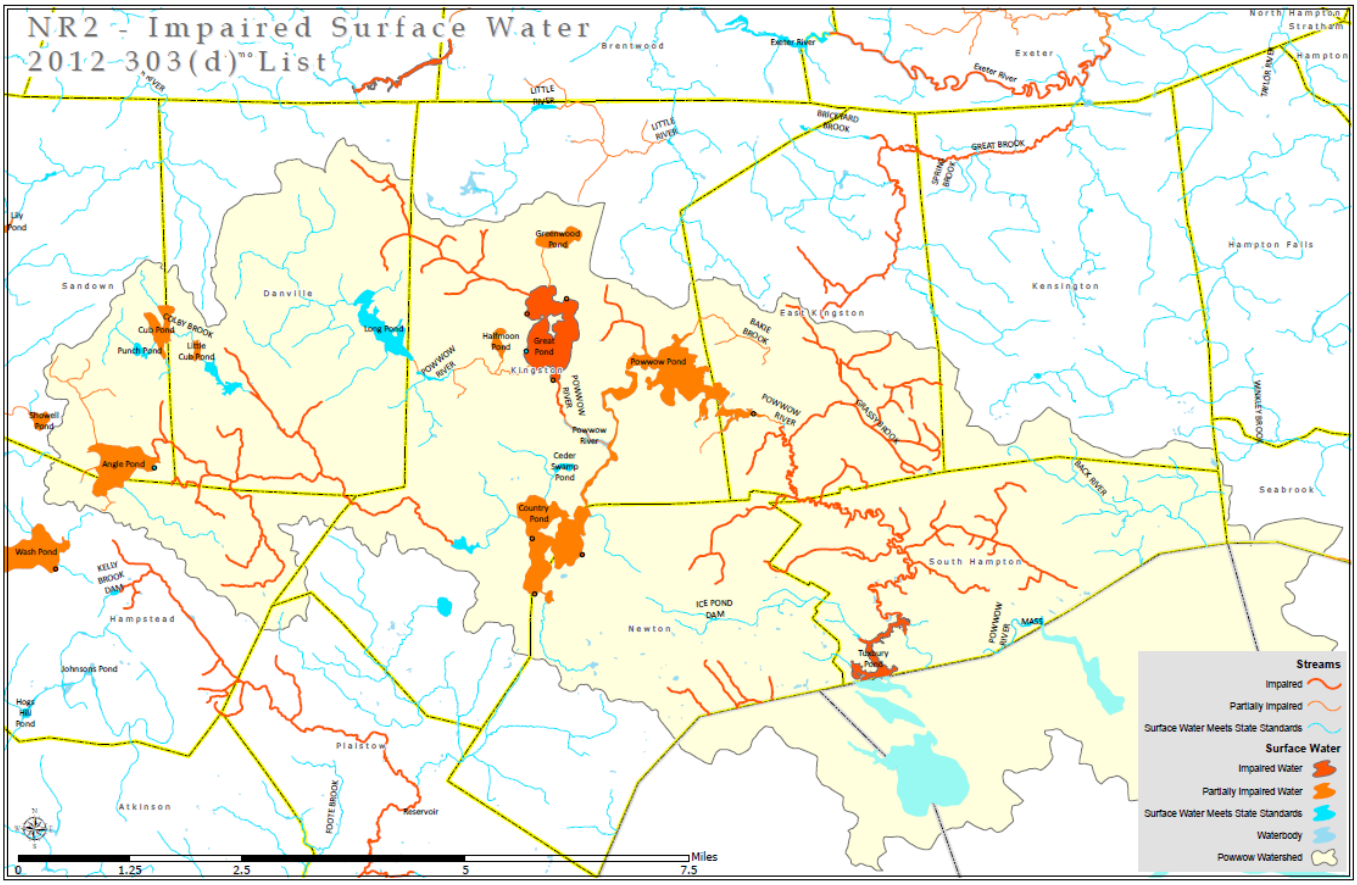
POWWOW RIVER WATERSHED COLLABORATIVE

IMPROVING WATER QUALITY IN THE POWWOW RIVER WATERSHED

MUNICIPAL AUDIT REPORT:
Water Quality Protections in the Powwow River Watershed

ROCKINGHAM PLANNING COMMISSION

Prepared by the Rockingham Planning Commission
September 2018



Funding for this project was provided in part by a Watershed Assistance Grant from the NH Department of Environmental Services with Clean Water Act Section 604(b) funds from the U.S. Environmental Protection Agency.

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

POWWOW RIVER WATERSHED MUNICIPAL AUDIT REPORT

INTRODUCTION

The purpose of this municipal audit is to document the existing levels of protection in force in the 10 NH municipalities that protects water quality and quantity, manages development impacts, and reduces pollutant loads in the Powwow River watershed.

Completing this municipal audit provides many benefits to the watershed communities:

- Identifies gaps and opportunities for improvement in regulatory and nonregulatory protections throughout the watershed.
- Informs municipal level policies, funding needs, investment priorities, and long-term infrastructure and facilities planning.
- Identifies options to adopt or amend existing regulatory standards to protect watershed resources and improve water quality.
- Provides a basis for future comprehensive watershed planning.

HOW CAN THE MUNICIPAL AUDIT BE USED?

Planning Boards can use the audit results to develop long-range plans to improve regulatory standards related to land development and resource protection.

Conservation Commissions can use the audit results to help establish priorities for land conservation investments that provide maximum water quality and resource protection benefits.

Municipalities that have waterbodies with shared boundaries can use the audit results to collaborate on water quality issues, reduce pollution entering waterbodies, and educate land owners about ways to protect water resources.

Infrastructure and facilities managers can use the audit results to prioritize asset improvements necessary to address water quality impairments and sources of pollution both point and nonpoint.

Municipal staff can use the audit results to identify gaps in regulatory protections needed for MS4 permit compliance, funding needs, planning and implementation.

KEY FINDINGS OF THE MUNICIPAL AUDIT

1. Updates/improvements needed in stormwater management regulations (post-construction).
2. Updates/improvements needed in erosion and sediment control regulations (during construction).
3. The terms “buffer” and “setback” are often used without definition, weakening their intent and effectiveness.
4. Posting information, zoning ordinances and land use regulations on municipal websites is not enough to elevate awareness of local regulations to protect water quality and quantity.
5. 5 municipalities subject to the EPA MS4 Permit; 5 municipalities are waivered or not subject to Permit.
6. 6 of 10 municipalities have no-disturb buffers to wetlands.
7. 3 of 10 municipalities have no-disturb buffers to streams, rivers and surface waters.
8. 2 of 10 municipalities have designated Prime Wetlands.
9. 8 of 10 municipalities have impaired water bodies in the watershed (Kensington and Seabrook have none).
10. 4 of 10 municipalities have adopted the SWA or equivalent stormwater management standards.
11. 1 of 10 municipalities have impervious surface limits for developments.
12. 3 of 10 municipalities have a designated Aquifer Protection District and protection zoning standards.
13. 2 of 10 municipalities have standards limiting development on steep slopes.

RECOMMMENDATIONS

Following are recommendations for regulatory, non-regulatory and municipal actions, and opportunities for collaboration to protect water quality at the municipal level.

REGULATORY ACTIONS

☑ *Adopt State of the Art Erosion and Sediment Control and Stormwater Management Standards*

All of the 10 watershed municipalities would benefit from some degree of updating or improvement to erosion and sediment control and post-construction stormwater management standards in their Site Plan Review Regulations and Subdivision Regulations. Specific standards absent in most existing regulations include:

- Numeric water quality treatment and pollutant removal criteria;
- Use of current precipitation data for design of stormwater infrastructure such as Northeast Regional Climate Center extreme precipitation atlas or NOOA precipitation atlas;
- Implementation of low impact development and Green Infrastructure practices;
- Stormwater volume controls and groundwater recharge requirements;
- Preparation of Operations and Maintenance Plans for privately owned stormwater infrastructure; and
- Specific inspection criteria during and after installation of stormwater BMP's.

Municipalities are encouraged to share examples of erosion and sediment control and post-construction stormwater management standards successfully implemented with other watershed municipalities.

☑ *Adopt No-Disturb Buffers and Development Setbacks to Wetlands and Surface Waters*

Buffer

A buffer is a naturally occurring or planted vegetated area that separates resources such as wetlands, streams, and lakes from human activity and disturbances. A buffer performs many functions including removing sediment and other pollutants from stormwater runoff, slowing the flow of stormwater runoff to these resources, storing flood waters, providing wildlife habitat, and regulating the temperature of surface water.

Existing naturally occurring vegetated buffers are also a cost-effective way of managing stormwater and removing pollutants from runoff. Natural buffers require little maintenance to keep them functioning and attractive landscape features. Man-made or replanted buffers can often be integrated into the landscaping plan for a developed site. Native plants are recommended for man-made or replanted buffers as these species are acclimated to local climate conditions so need less watering and upkeep.

Setback

A setback is the distance separating resources such as wetlands, streams, rivers and lakes typically from buildings and septic systems. Setbacks are not required to remain vegetated and are often allowed to be developed into parking lots, stormwater management structures, and other structures that support a development.

Buffer Versus Setback: What do they mean to accomplish?

Functionally, buffers and setbacks are quite different. A buffer serves to protect the area of separation in a natural state thereby preserving the natural functions (described above) of the fringe areas surrounding the resource. Setbacks do little or nothing to protect these natural functions and in some instances incentive replacing natural vegetation in the setback with managed turf, lawn, accessory structures and impervious surfaces.

☑ *Adopt Impervious Surface Limits for Developed Sites*

A uniformly effective method for reducing stormwater runoff is to set impervious surface limits for developed sites. Another important aspect of runoff to keep in mind is the cumulative impact of impervious cover in a particular drainage area or subwatershed. While total impervious surface acreage in a municipality may remain at or below the recommended 15 percent threshold to prevent water quality and aquatic habit impacts (Schueler, 2000[1]), where impervious surfaces are located is also important as concentration of impervious surfaces can cause localized flooding, pollutant loading and erosion problems. These headwater areas of a watershed are critical for protecting water quality as they typically contain a dense network of small streams that attenuate pollution and maintain water temperature.

> *Impervious surfaces* (or impervious cover) are hardened surfaces such as asphalt, concrete, rooftops and stone that do not infiltrate water and runoff. Impervious surfaces can include highly compacted materials like gravel and crushed asphalt that do not readily infiltrate water or runoff.

Another element of impervious surface to consider what is called "*effective impervious area*" or EIA which is the portion of total impervious area that is discharged to surface waters and wetlands or hydraulically connected to the storm sewer system. In other words, EIA takes into account the impervious surfaces that can contribute to water pollution and degradation. For example, a bio-retention area where all stormwater runoff from impervious surfaces is treated and infiltrated in the ground would not count toward EIA.

RECOMMENDED NON-REGULATORY ACTIONS

☑ *Develop and Implement a Comprehensive Public Outreach and Engagement Initiative About Water Quality Protection and Sources of Water Pollution*

Provide information via municipal website, social media, and at municipal and civic events about how residents and businesses can help protect water resources. The purpose of this outreach is to empower residents and businesses to identify water quality problems and take action on their own property to remedy them. Informational materials should focus on the "how to's" of protecting water quality by illustrating "if I do this, this will be the result". Convening neighborhood gatherings can be an informal and social way to strengthen local support to address water quality problems and deepen understanding of and interest in solving them.

☑ *Utilize Land Protection and Conservation to Protect High-Quality and High-Value Water Resources*

Evaluate the most critical local water resource protection features including groundwater recharge areas, stratified drift aquifer deposits, and the condition of natural buffers to surface waters and wetlands, and features that could negatively impact water quality such as steep slopes, erodible soils and impervious surfaces. Evaluate existing land uses and zoning district standards. Use this information to prioritize land for conservation and protection. Develop water resource protection objectives to incorporate into the scoring criteria used for land acquisition decisions. Partner with regional land trusts and national land conservation organizations to conserve and protect high-value water resource lands. Consider implementing other water resource protection measures such as Groundwater Reclassification (see NHDES www.des.nh.gov/organization/divisions/water/dwgb/dwspp/reclassification/index.htm) or protecting groundwater recharge areas by requiring infiltration of stormwater runoff, prohibiting land uses that pose a high risk for contamination, limiting development of steel slopes, and land conservation.

RECOMMENDED MUNICIPAL ACTIONS

☑ *Identify Measures for Municipal Properties, Facilities and Infrastructure and Prioritize Their Implementation to Address Water Quality Impairments*

[1] The Importance of Imperviousness, Schueler 2000. Feature article from Watershed Protection Techniques. 1(3): 100-111

Another way of leading by example is to ensure that municipal properties, facilities and infrastructure are being managed properly so as not to contribute to water quality impairment. As part of their overall Stormwater Management Plan, MS4 municipalities are required to inventory their municipal properties, facilities and infrastructure and identify measures to improve impaired waters and protect high-quality waters. Some MS4 areas cover only a portion of a municipality, however because water does not abide by MS4 boundaries, it makes sense to apply the same methodology across the entire municipality beyond just their MS4 area and by those municipalities with waivers or that are not subject to the MS4 permit. Non-MS4 and waivered municipalities can prioritize corrective measures for municipal properties, facilities and infrastructure that discharge stormwater runoff to a surface water body or hydrologically connected wetlands.

☑ *Install Demonstration Projects at Municipal Properties and Facilities*

Municipalities can lead by example by installing demonstration projects aimed at eliminating a source of water quality pollution. Tangible examples go a long way toward helping property owners visualize what these practices may look like in their own back yards such as a rain garden, grass swale or vegetated buffer.

☑ *Work Toward Improving Water Quality Regardless of Whether the Municipality is Subject to the MS4 Permit*

MS4 communities are responsible for complying with the water quality standards in their permits, however in many instances water flows across borders from non-MS4 and waivered municipalities to permitted municipalities. For this reason, being proactive voluntarily about protecting water quality only makes sense and could result in a more effective and consistent approach on a watershed scale.

☑ *Incorporate Water Quality Goals and Objectives in the Municipal Master Plan (e.g. Vision Chapter, Land Use Chapter, Natural Resources Chapter or Natural Resources Inventory).*

Under RSA 674:2 Master Plan Purpose and Description, municipalities and Planning Boards are responsible for maintaining a Master Plan to ensure appropriate future development, preserving and enhancing the unique quality of life and culture in New Hampshire, and guide smart growth, sound planning, and wise resource protection. The Master Plan is a document that lays out a vision chapter containing a set of guiding principles and priorities, and supporting chapters that state the goals and objectives necessary to carry out that vision. The Master Plan enables the municipality to plan, regulate, invest and otherwise act to attain their vision, goals and objectives for water quality and water resource protection.

OPPORTUNITIES FOR COLLABORATION

☑ *Collaborate with Lake and Pond Associations*

Most major water bodies in the watershed have a formal association or active stewardship organization of some kind. These groups often perform water quality testing, conduct outreach to property owners, work to control non-native aquatic species, and interact regularly with local residents and property owners about environmental issues. Municipalities can benefit from the expertise of these groups, share data, and collaborate to fund and implement new water quality initiatives including identifying sites for erosion control and stormwater retrofit projects. The causes of pollution are more readily identified when all parties are engaged and have a similar level of understanding.

☑ *Collaborate with the Manchester/Nashua and Seacoast Stormwater Coalitions*

Regional stormwater coalitions, comprised of municipal representatives and stormwater professionals, are very helpful in organizing municipalities, providing resources and guidance, and sharing success stories. Refer to the NH Stormwater Coalition website at https://www.des.nh.gov/organization/divisions/water/stormwater/coalitions.htm for stormwater related materials. Watch for new materials focused on water quality outreach and education to be posted soon.

☑ *Collaborate with Neighboring Municipalities on Public Outreach and Engagement*

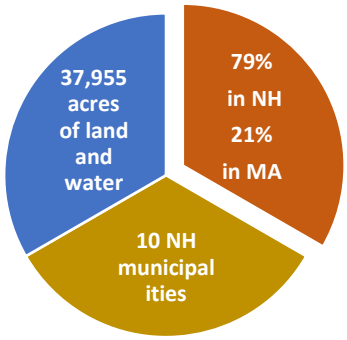
Because most municipalities share surface water bodies and watershed boundaries, collaborating on public outreach and engagement can result in consistent messaging and wider public support for water quality protection (e.g. interests ranging from recreation, fishing, habitat and drinking water). Local messages resonate most effectively with local water based activities and users which can help create a stronger sense of ownership about water quality issues and the actions necessary to address them.

☑ *Collaborate on Water Quality Testing with Municipalities that Share Water Bodies*

Lake and Pond Associations and municipalities under an EPA MS4 permit can benefit from collaborating on water quality testing for shared waterbodies. In additional to efficiency and cost savings, a more comprehensive water quality profile and history can be collected for each water body. Water quality testing can help document over time the effectiveness of measures implemented to reduce specific pollutants causing impairments and guide adjustment of measures as necessary to improve the desired reductions.

APPENDIX A: FACTS AND FIGURES ABOUT THE POWWOW RIVER WATERSHED

The Powwow River Watershed contains 37,955 acres of land and water: 30,114 acres (79 percent) in New Hampshire and 7,842 acres (21 percent) in Massachusetts (Merrimac and Amesbury). Ten New Hampshire municipalities are partially or wholly within the watershed: Seabrook, Kensington, East Kingston, Kingston, Danville, Sandown, Hampstead, Newton and South Hampton. South Hampton is the only NH municipality located entirely within the watershed.



Municipality	Total Area (acres)	Acres in Watershed	% Area in Watershed (acres)	Impervious Surface (watershed acres)
Danville	7,569	5,575	73%	325 / 5.8%
East Kingston	6,381	3,144	49%	132 / 4.2%
Hampstead	9,014	1,581	17%	*NA*
Kensington	7,668	699	9%	19 / 2.7%
Kingston	13,450	7,836	58%	434 / 5.5%
Newton	6,365	4,244	67%	*NA*
Plaistow	6,790	77	1%	*NA*
Sandown	9,232	1,583	17%	83 / 5.2%
Seabrook	6,161	228	4%	32 / 14.0%
South Hampton	5,147	5,147	100%	*NA*

Note: NA = Impervious surface data not available

Land Conservation Plan for the Merrimack River Watershed of New Hampshire and Massachusetts (2014)			
Resource Category	Total Acres	Acres in NH	Acres in MA
Tier 1 – Highest value	6,303	6,020 (96%)	283
Tier 2 – Higher value	16,242	14,569 (90%)	1,673
Tier 3 – High value	9,085	8,071 (89%)	1,014
Total Acres	31,630	28,661 (91%)	2,970

Source: Land Conservation Plan for the Merrimack River Watershed of New Hampshire and Massachusetts (2014) available on the Society for Protection of New Hampshire Forests website at https://forestsociety.org/sites/default/files/Merrimack%20Plan%20Executive%20Summary%20FINAL%20April%202014.pdf

Resource Category	Acres in Watershed-NH	% Total Watershed-NH
Freshwater Wetlands	6,997	23%
Forested	13,285	44%
Stratified Drift Aquifer	8,911	30%
Surface Water	1,570	5%
Agricultural Soils (total)	9,651	32%
Farmland of Statewide Importance	3,796	13%
Farmland of Local Importance	4,349	14%
Prime Farmland	1,506	5%
NH Wildlife Action Plan	**Acres in Watershed-NH**	**% Total Watershed-NH**
Tier 1 – Highest	3,928	13%
Tier 2 - Higher	4,884	16%
Tier3 - High	7,210	24%
Total Acres	16,022	53%
Land Use Category	**Acres in Watershed-NH**	**% Total Watershed-NH**
Undeveloped Lands	16,157	54%
Developed Lands	13,957	46%