

Pollutant Hot Spots - Priority Ranked Parcel Summary Report

Municipality: Portsmouth, NH

Date of Report: November, 2021

Purpose

The NH 2017 Small MS4 General Permit requires for permittees to create an inventory and priority ranking of permittee-owned properties that could be retrofitted with Best Management Practices (BMPs) to reduce stormwater discharges and address pollutant loading from catchments identified as having high loading for nitrogen and/or phosphorus. To aid in these efforts, the information presented in this report may be used to identify and prioritize measures to reduce pollutant loading to impaired waters from the permittee's MS4 area.

This information will assist in fulfilling the following permit requirements for Year 4:

1. MCM #5 Post Construction Stormwater Management
 - a. Inventory and priority ranking of permittee-owned property and existing infrastructure that could be retrofitted with BMPs designed to reduce frequency, volume and pollutant loads of stormwater discharges (page 48, section 2.3.6.e).
2. Appendix H - Requirements Related to Water Quality Limited Waters
 - a. Nitrogen Source Identification Report (Appendix H, page 3, section I.1.b).
 - b. Phosphorus Source Identification Report (Appendix H, page 6, section II.1.b).
3. Appendix F - Lake and Pond Phosphorus TMDLs
 - a. Information in this report may be used in the development of Lake Phosphorus Control Plans (LPCP), such as developing a priority ranking of areas and infrastructure for potential implementation of phosphorus control practices.

Methods

Geographic Information System (GIS) analysis of the municipality of Portsmouth, NH was performed in 2019 using publicly available GIS layers; the analysis yielded total suspended solids (TSS), total nitrogen (TN), and total phosphorus (TP) pollutant load "hot spot" data per parcel by utilizing layers for parcel boundaries, conservation areas, land use, and impervious cover (IC) coupled with the pollutant load export rates found in Table 2-1 of Appendix F of the NH MS4 permit*.

The results were sorted to identify non-conservation parcels owned by the municipality in descending order by acreage of impervious cover, which indicated the priority rank for BMP implementation on municipally owned properties. Parcels were ranked using impervious cover because it is a key metric representing the largest manageable load for pollutants commonly associated with stormwater. Because impervious cover is not evenly distributed on municipal parcels, the graph of cumulative percent of impervious cover for the resulting ranked parcels is non-linear with a typical "knee" which indicates

*<https://www.epa.gov/npdes-permits/new-hampshire-small-ms4-general-permit>

the point of decreasing IC area per additional parcel to be managed. The knee represents the optimal number of parcels to be treated by BMPs as they will treat the most impervious cover on the least number of parcels. This method also generally optimizes the resulting TSS, TN, and TP reductions, and costs for treatment as they are all linked to the IC area.

Results

Figure 1 shows the graph of cumulative percent of IC for the resulting ranked, municipal, non-conservation parcels. The knee of the curve is called out as the goal for treatment.

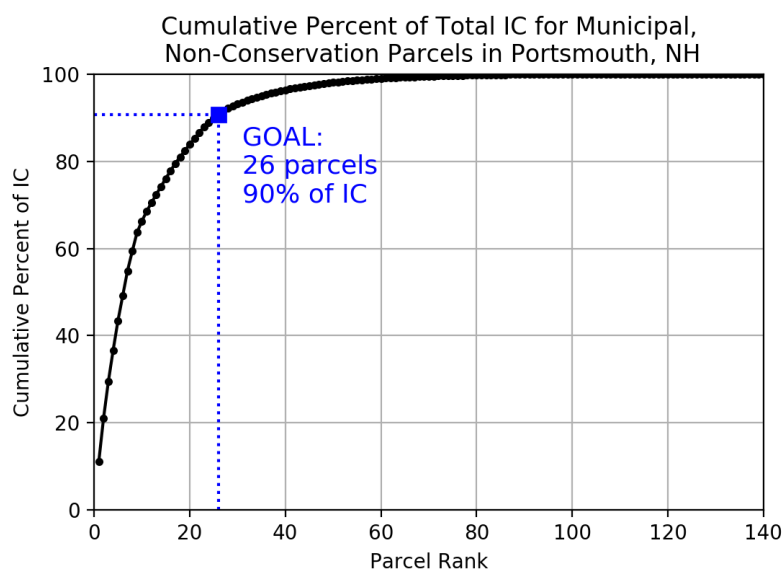


Figure 1: Cumulative percent of IC vs rank (priority) for municipal, non-conservation parcels.

Portsmouth's target for treatment is 26 parcels . Treating all the IC from these top 26 parcels accounts for 90% of all the municipally owned, non-conservation properties.

Pollutant reductions were estimated using the EPA performance curves for an infiltration basin BMP class** with a physical storage capacity of 0.4 inches and infiltration rate of 1.02 in./hr.. The curve yields 96% TSS reduction, 92% TN reduction, and 81% TP reduction. Table 1 is a summary table showing the IC, TSS reduction, TN reduction, TP reduction, and total estimated costs using the EPA costs outlined in UNH performance fact sheets** for the top 26 parcels and the percentage of the top parcels to the total municipal, non-conservation properties.

Table 1: Summary of priority municipal, non-conservation parcels. The total IC, TSS, TN, and TP reductions using the stated assumed treatment, and estimated cost of treatment are summarized for the priority parcels and their percentage of total municipal, non-conservation parcels.

	IC	TSS Red.	TN Red.	TP Red.	Cost
Top 26 Parcels Total	64 ac	38,868 lb/yr	869 lb/yr	93 lb/yr	\$2,955,000
Percent of Municipal, Non-Cons.	91%	89%	88%	88%	91%

**https://www.unh.edu/unhsc/sites/default/files/media/ms4_permit_nomographs_sheet_final_2020.pdf

Table 2 shows the priority list of the 26 municipal, non-conservation parcels with their NH GIS ID and street address.

Table 2: Priority municipal, non-conservation parcels ranked by descending IC with NH GIS ID and street address.***

Treatment Priority	IC (ac)	NH GIS ID	Street Address
1	7.83	08178-0254-0008-0000	680 Peverly Hill Rd
2	7.06	08178-0208-0001-0000	99 Peirce Island Rd
3	5.91	08178-0239-0012-0000	Gosling Rd
4	5.06	08178-0110-0001-0000	1 Junkins Ave
5	4.77	08178-0206-0020-0000	50 Clough Dr
6	4.09	08178-0250-0106-0000	32 Van Buren Ave
7	4.03	08178-0220-0002-0000	1 Franklin Dr
8	3.17	08178-0114-0001-0000	Junkins Ave
9	3.05	08178-0128-0016-0000	Parrott Ave
10	1.82	08178-0117-0001-0000	34 Hanover St
11	1.60	08178-0115-0004-0001	Parrott Ave
12	1.38	08178-0136-0016-0000	245 Middle St
13	1.35	08178-0128-0015-0000	155 Parrott Ave
14	1.30	08178-0292-0012-0000	3010 Lafayette Rd
15	1.29	08178-0243-0004-0000	195 Greenleaf Ave
16	1.25	08178-0116-0038-0000	140 Court St
17	1.21	08178-0174-0002-0000	Woodbury Ave
18	1.05	08178-0242-0002-0000	1 Plains Ave
19	1.03	08178-0259-0010-0000	35 Sherburne Rd
20	1.00	08178-0217-0005-0000	25 Granite St
21	0.96	08178-0128-0014-0000	175 Parrott Ave
22	0.95	08178-0104-0001-0000	Marcy St
23	0.93	08178-0126-0003-0000	Maplewood Ave
24	0.71	08178-0138-0060-0000	100 Foundry Pl
25	0.66	08178-0104-0005-0000	Marcy St
26	0.58	08178-0126-0059-0000	11 Bridge St

***For the complete prioritized spreadsheet including loads, reductions, and estimated costs, see:
https://www4.des.state.nh.us/nh-ms4/?page_id=1798