Green Infrastructure Rapid Assessment Plan

Densmore Creek Watershed

Prepared by:

The Stormwater Coalition of Monroe County and

Monroe County Department of Environmental Services

Prepared for:

New York State Environmental Protection Fund — Round 10

September 2013

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Cover Photos: Top - Densmore Creek below Culver Road; Bottom - Densmore Creek below Norton Street

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List of Abbreviations

cfs	cubic feet per second
CSO	Combined Sewer Overflow
CWP	Center for Watershed Protection
DPW	Department of Public Works
EMC	Event Mean Concentration
EPA	US Environmental Protection Agency
GI	Green Infrastructure
GIS	Geographic Information System
GPS	Global Positioning System
IC	Impervious Cover
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
POC	Pollutant of Concern
SWAAP	Stormwater Assessment and Action Plan

Section 1. Assessment Overview

1.1 PROBLEM STATEMENT:

Similar to many developing areas, growth in Monroe County has caused some unfortunate consequences to water quality. One consequence is that developed areas shed larger volumes of stormwater from impervious surfaces (roads, buildings and parking lots) than natural landscapes. Because there is more water volume, there is more pollution. Typical pollutants include: petroleum products and heavy metals from vehicles; fertilizers, chemicals and animal waste from lawns; and, sediment from eroded streambanks, construction sites and roadways.

A second consequence is that streams more frequently flow full or overflow their banks. High stormwater flows can cause flooding, damage property, and harm fish and wildlife habitat. Common damages from high flows are eroded stream banks, wider and deeper stream channels, and excessive sediment deposition. The degradation results in poor water quality and added maintenance costs to municipalities and property owners. In Monroe County, stormwater pollution and associated wet weather flows have had an impact on virtually all urban streams, the Genesee River and Lake Ontario's shoreline.

1.2 PURPOSE:

Developing plans to improve our impacted water resources is the objective of the Rapid Green Infrastructure Assessment Plan (Plan). A streamlined method was devised to quickly evaluate multiple watersheds for stormwater retrofit potential. The main product is a ranked inventory of retrofit projects that, if constructed, could improve water quality and stream health while also providing flow attenuation to reduce erosive storm flows and localized drainage problems. A second significant product is the creation of multiple, electronic data files and maps that lay the foundation for future, more in-depth studies. The Plan is a simplified version of more detailed Stormwater Assessment and Action Plans being done in other parts of Monroe County. These larger studies include water quality sampling as well as modeling the effects of the current watershed's condition and the potential improvement from proposed retrofits. The field work completed for this report was kept to a minimum and only a summary report is produced (herein). The project was conducted with funding from New York's Environmental Protection Fund, the Monroe County Department of Environmental Services, and the Stormwater Coalition of Monroe County.

1.3 Setting

There are two branches of Densmore Creek (Figure 1). The headwaters of the main branch are in the northeast side of Rochester NY and the northern tributary is Hobbie Creek who's headwaters are in the southeast portion of the Town of Irondequoit. Flowing through the Town of Irondequoit, the creek and tributary flow easterly for four miles and merge before discharging into Irondequoit Bay.

The watershed is highly urbanized with 42 percent impervious cover and over half its length piped or channelized with concrete lined walls. The actual watershed size of 1640 acres is much smaller than would naturally drain to this watershed because the upstream portion within Rochester flows to the combined sewer system (see "Combined Sewer System" discussion under section 1.4.1 below).

The major land use in the watershed is residential with a dense commercial area mainly along the northern portion of Ridge Road East (Figure 2). Table 1 lists other relative watershed statistics.

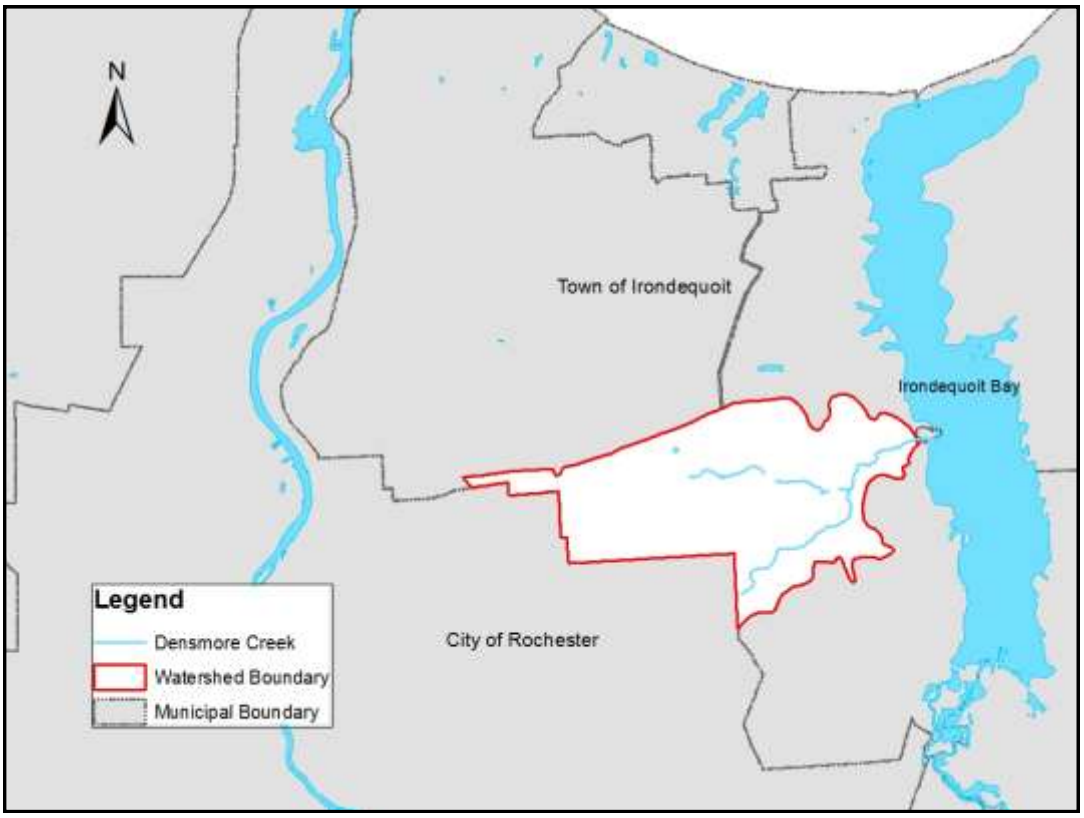


Figure 1: Densmore Creek Watershed.

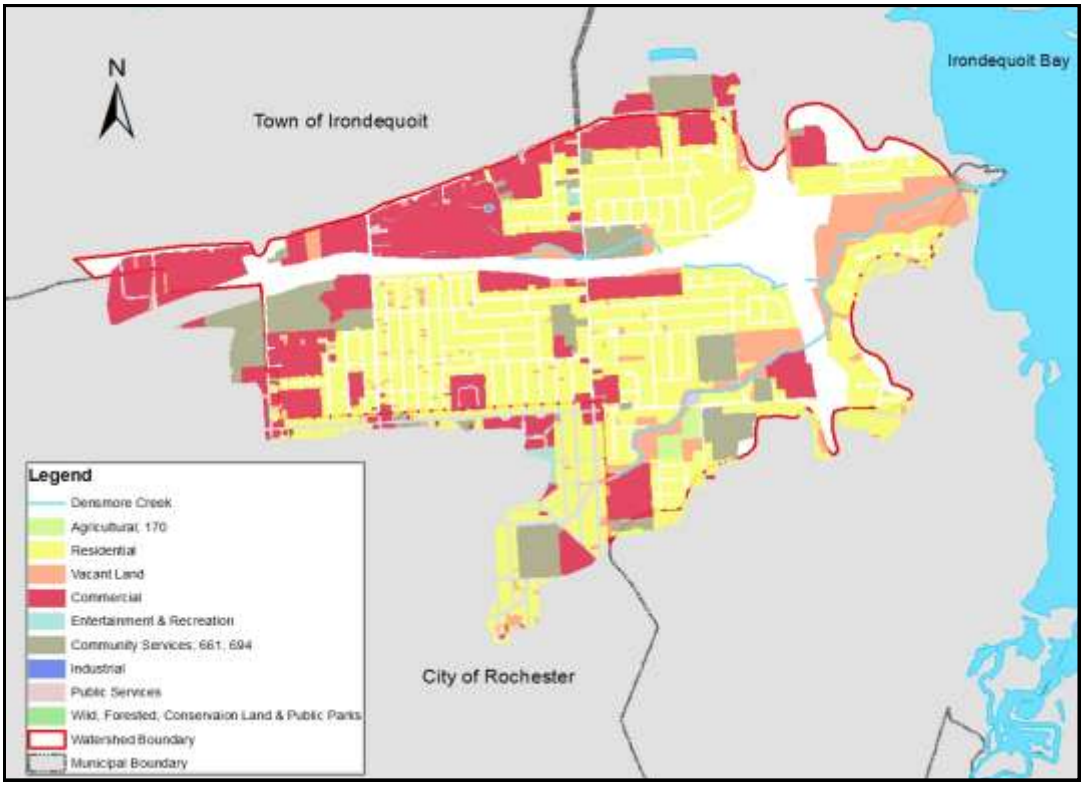


Figure 2: Densmore Creek Land Use.

Table 1. Watershed Data	
Metric	**Value**
Area	1640 (Acres)
Mapped Stream Length	3.51 (Miles)
Percent of Stream Channelized	53%
Primary/secondary land use	Residential, Commercial
Land Use (percent of watershed)	
Agricultural	1%
Residential	43%
Vacant Land	11%
Commercial	25%
Recreation & Entertainment	<1%
Community Service	12%
Industrial	<1%
Public Services	<1%
Wild, Forested, Conservation Lands & Public Parks	8%
# of Stormwater Treatment Ponds	3
# of Stormwater Outfalls	21
Current Impervious Cover (%)	42
Estimated Future Impervious Cover (%)*	44
Wetland acres	19.7
Municipal Jurisdiction	Rochester, Irondequoit

* estimated for 20 year build out

1.4 WATERSHED CHARACTERISTICS:

1.4.1 Water Quality Concerns The New York State Department of Environmental Conservation's (NYSDEC), 2004 Lake Ontario (Minor Tribs) Basin Waterbody Inventory/ Priority Waterbodies List (revised 2007, NYSDEC 2004), states that *"Aquatic life support and recreational uses of Densmore Creek is thought to be limited by sewage inputs and various urban runoff impacts. Various nonpoint urban and stormwater runoff sources are suspected of causing water quality impacts to most of the smaller minor tribs to the bay. A biological (macroinvertebrate) assessment of Densmore Creek in Newport (at Bayshore Drive) was conducted in 1999. Sampling results indicated moderately impacted water quality conditions. Impact Source Determination identified sewage wastes as the primary factor affecting the fauna. (DEC/DOW, BWAM/SBU, January 2001)".* The full waterbody datasheet is in Appendix A and includes two other minor tributaries to Irondequoit Bay (Glen Haven and Tufa Glen Creeks). Each has had a separate rapid assessment completed (Stormwater Coalition of Monroe County 2013).

In 2010, these three tributaries were added to NYSDEC's Waterbody Inventory/Priority Waterbodies List (revised 2013, NYSDEC), called the "303d" list because it refers to section 303(d) of the Federal Clean Water Act. The 303d list is generated and updated every two years by NYSDEC who must consider a restoration strategy to reduce the input of the specific pollutant(s) that cause "impairments" or restrict a listed waterbody's use. Impaired water does not support appropriate uses (drinking, swimming, fishing etc.) and may require the development of a Total Maximum Daily Load (TMDL- a prescribed diet that reduces the inputs of the listed problem pollutants) or, some other restoration strategy.

Pollutants noted on the 303d list for Densmore Creek are oxygen demand, urban runoff, and phosphorus from municipal sources. Adding to the complexity of the 303d process is how the list is divided into three parts, depending on how much information is known about the impairments. Densmore Creek is listed as a **"**Waterbody for which TMDL Development May be Deferred (Requiring Verification of Cause/Pollutant)". It is anticipated that implementation of this report's retrofit projects will help to reduce the impairment level and avoid the regulatory approach of TMDL development.

Combined Sewer System - Since the early 1900's, untreated sewage discharges commonly flowed to Densmore Creek and Irondequoit Bay from the sewer collection system called, combined sewers. Combined sewers convey both stormwater and wastewater. In dry weather, the flow went to the wastewater treatment plant but when it rained, the combined sewers became overloaded and the flow was discharged to waterbodies like Densmore Creek in what is called a combined sewer overflow (CSO). Combined sewers are common in older urban areas across the US. Federal regulation of water pollution came in stages and in the 1960's, combined sewer discharges to Densmore Creek were routed through a small sewage treatment building on Norton Street where combined flow was disinfected with chlorine and released back to the creek channel. It was reported that the chlorination dosing was so high, the surrounding neighborhood smelled of chlorine. The chlorine killed harmful bacteria in the mixed water but also killed off the natural organism in the creek (RCSI 1967).

To deal with the huge problems and costs of separating the combined sewer system, the Pure Waters Program was created and districts were established in 1968. Deep, large tunnels were built in the early 1970's to divert and store combined sewerage, that is then treated at the Frank E. Van Lare (Van Lare) Sewage Treatment Plant rather than discharged to waterbodies.

There are still two locations were CSOs can occur on Densmore (Figure 4). One is at the old chlorination facility on Norton Street in Irondequoit. The second is slightly further downstream at the Culver-Goodman Control Structure. This is a relief point for the Culver-Goodman tunnel were it can overflow, usually only during very extreme rain events.

Other reports that reference Densmore Creek's water resource value is the Irondequoit Bay Harbor Management Plan (Dufresne-Henry 2003) which discusses the mouth of the creek at Irondequoit bay: *"Although moderately developed, the Densmore Creek alluvial fan/wetland area retains considerable wildlife value, although some natural shoreline has been lost to bulkheading. Cooper noted that northern pike congregate here and may spawn offshore. The gradual transition between upland and aquatic habitat makes this area valuable for a variety of waterfowl, shorebirds and upland animals."*

Figure 4: The Norton and Culver-Goodman Control Structures adjacent to Densmore Creek.

1.4.2 Impervious Cover Analysis The Center for Watershed Protection created the "Impervious Cover Model" (ICM) to predict a typical stream's health using the relationship between subwatershed impervious cover and stream quality indicators. This relationship has have been confirmed by nearly 60 peer-reviewed stream research studies (Figure 5). The ICM shows stream quality decline becomes evident when the watershed impervious cover exceeds ten percent. The Densmore Creek Watershed has an average of 42 percent impervious cover. According to the model this would place Densmore stream quality somewhere between poor and fair and non-supporting of aquatic life. Based on current zoning, future impervious cover (over the next 20 years) will increase by 2 percent.

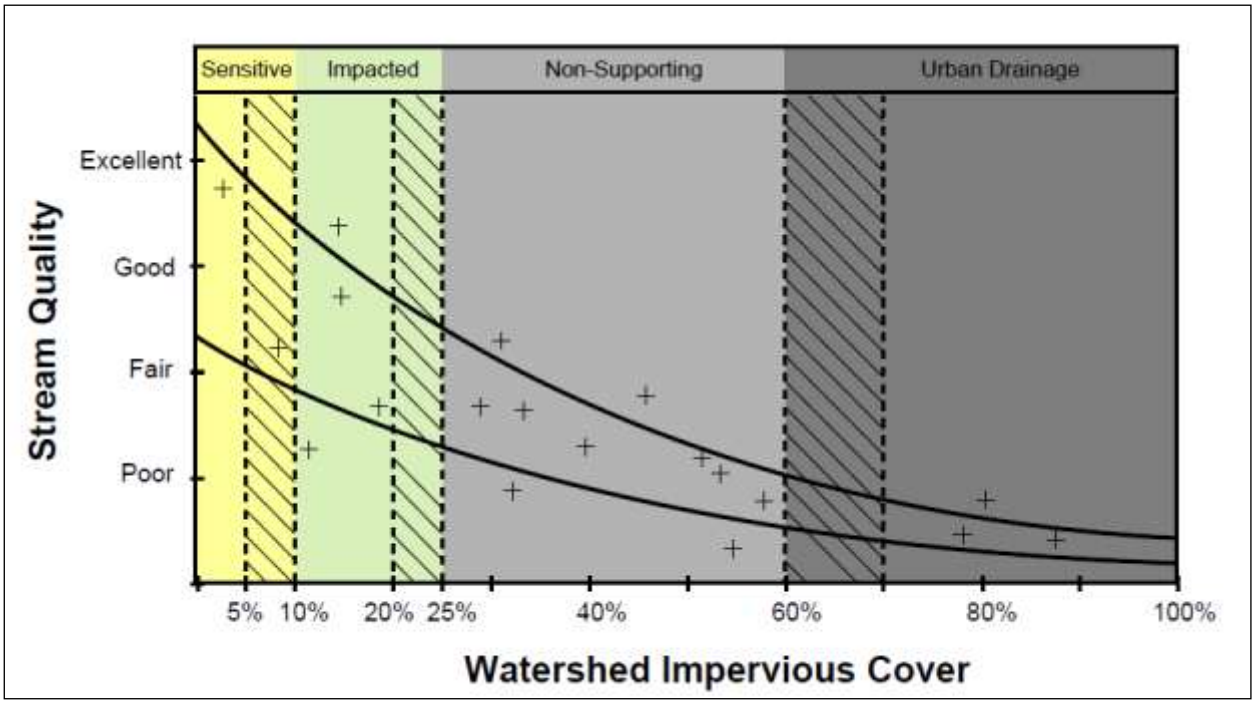


Figure 5: Impervious Cover Model

1.4.3 Drainage Concerns In the City of Rochester's sewer system, the issue is the capacity of the combined sewers. Large storm events still can overwhelm the system and send combined sewage to the Creek.

1.4.4 Streambank Erosion - The Creek has numerous locations of eroding streambanks and has been armored through most of the developed portions of the watershed. A significant eroding section of Hobbie Creek is recommended for stabilization as well as several others along the main stem downstream of NYS Route 590 (Figure 6).

Figure 6: Severe streambank erosion on Hobbie Creek, 200 feet upstream of its confluence with Densmore Creek.

1.4.5 Soils - A simplistic yet useful way to define how much stormwater runs off the pervious land surface is to determine soils' infiltration capabilities. Soil scientist have categorized soils into four categories, A through D. A and B soils are well drained and absorb much of the stormwater that drains on or over them. C and D soils are more poorly drained. However, the soils in some parts of this watershed are not categorized, denoting areas that have been so altered by land development that grouping a specific soil type is not feasible. Figure 7 shows watershed soils which are generally dominated by C and D soils.

A conservative estimate of these unverified soils is to consider them poorly drained or D soils. The amount of each soil type in Densmore Creek is: A soils 14%; B soils 28%; C soils 26%; and D soils or not verified 32%.

A large percentage of A and B soils in the upper watershed areas have been paved over with commercial and residential development. Yet these areas provide opportunities to retrofit with infiltrating green infrastructure practices. These practices installed in the upper parts of the watershed may reduce flooding, drainage problems, and streambank erosion as well as greatly improving water quality in Densmore Creek and Irondequoit Bay.

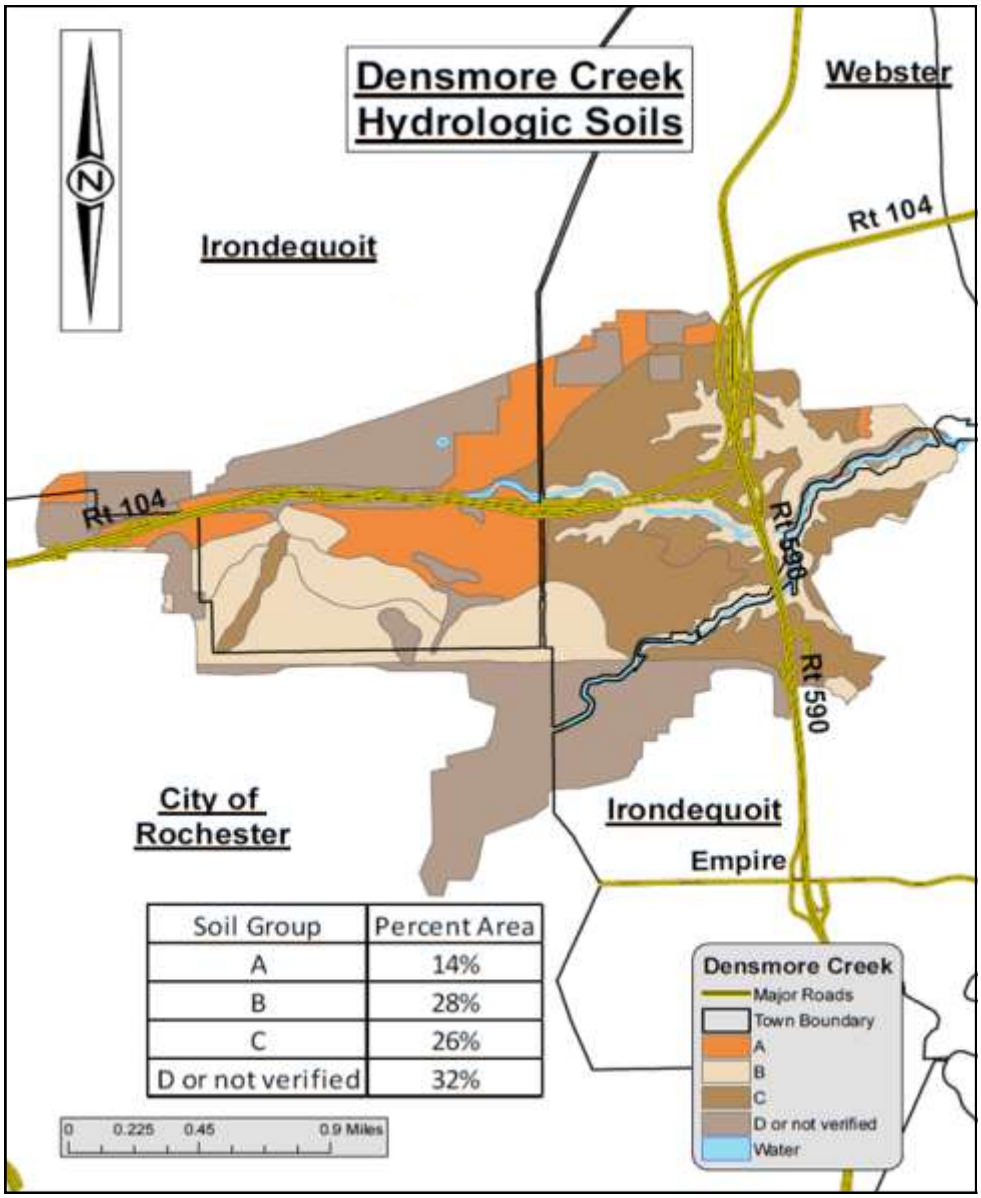


Figure 7: Hydric Soils Map of Densmore Creek.

Section 2. Retrofit Inventory

An inventory of potential retrofit sites was generated using GIS mapping tools to locate public properties, stormwater practices such as ponds, old urban areas (built before stormwater management requirements) and pervious soil areas. Next, the appropriate stormwater management practice was determined for the properties identified and ranked based on their feasibility, possible water quality improvement and cost effectiveness. While the stormwater management practice types focused on green infrastructure (stormwater volume-reducing practices such as infiltration), there are project types that include retrofitting stormwater ponds which can be a highly cost-effective practice. Stormwater pond projects rank well and are a recommended component of watershed restoration. Complete details of methods used to complete the rapid assessment and retrofit ranking is explained in a reference document titled "Assessment Methodology, Project Descriptions, and Retrofit Ranking Criteria For Monroe County Green Infrastructure Rapid Assessment Plans".

Two broad categories of retrofit project types were considered:

1) New Stormwater Ponds, upgrades to existing stormwater ponds and adding stormwater storage to existing drainage channels.
2) Green Infrastructure (GI). This category was divided and ranked by where a GI project might be installed and includes:
   - Public Right of Ways - All paved cul-de-sacs were identified for retrofitting with a rain garden/bioretention. Also, the large, green spaces adjacent to the NYS Route 104 and 590 expressways were also selected for stormwater storage ("new ponds") and or bio-retention.
   - Older Residential Neighborhoods - Of the 3073 single family homes in this watershed, 2869 of them (93%), were built before 1975—typically before stormwater runoff was detained and/or treated for flood or quality control. There are 24 large subdivisions listed for possible green infrastructure neighborhood retrofits totaling 1993 residences.
   - Other Locations (such as areas with large impervious surfaces ie. shopping malls) - Several large paved areas were identified and included for possible retrofitting.

Other watershed retrofitting that would help meet water quality goals include the investigation and remediation of any stormwater hotspots (Appendix B) and dechannelization and revegetation of straightened and degraded stream corridors (Appendix C). However these projects are outside the scope of this report and therefore were not ranked. Figure 8 shows project locations and project numbers within the watershed. Table 2 lists project addresses and how they scored. Diagrams of a variety of potential projects follow the table.

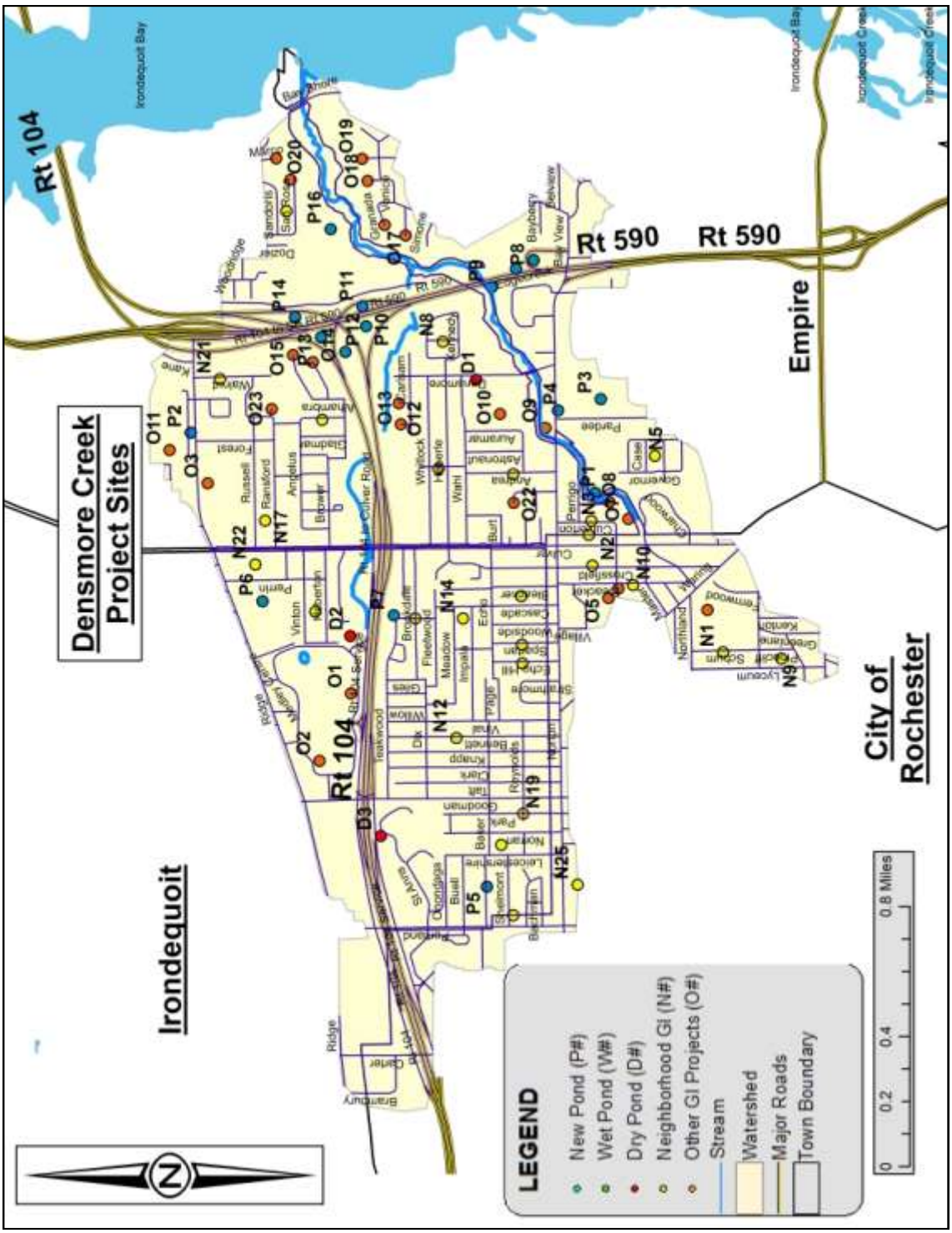


Figure 7: Retrofit project locations within the Densmore Creek watershed.

Table 2 Densmore Creek Retrofit Ranking List

Map ID	Project Type	Project Location	Feasibility	Environmental Benefits	Cost Effectiveness	Total Score
P2	New Pond	2350 East Ridge Road	4	S, WQ, I, Cp, E	3	13
P14	New Pond	NYSDOT 590 storage retrofits along 590	5	S, WQ, I, Cp	3	13
P15	New Pond	NYSDOT 590 storage retrofits along 590	5	S, WQ, I, Cp	3	13
P10	New Pond	NYSDOT 590 storage retrofits along ROW	5	S, WQ, I, Cp	3	13
P11	New Pond	NYSDOT 590 storage retrofits along ROW	5	S, WQ, I, Cp	3	13
P12	New Pond	NYSDOT 590 storage retrofits along ROW	5	S, WQ, I, Cp	3	13
P13	New Pond	NYSDOT 590 storage retrofits along ROW	5	S, WQ, I, Cp	3	13
P8	New Pond	NYSDOT 590 storage retrofits along ROW	5	S, WQ, I, Cp	3	13
P9	New Pond	NYSDOT 590 storage retrofits along ROW	5	S, WQ, I, Cp	3	13
P16	New Pond	Town of Irondequoit 53 ac parcel Eagle Rock Dr.	5	S, WQ, I, Cp	3	13
D1	Dry Pond Conversion	165 Densmore Road	5	S,WQ, Cp,E	3	12
P7	Dry Pond Conversion	2621 Culver Road	3	F,WQ,Cp, I	3	11
D2	Dry Pond Conversion	285 Medley Center Parkway	5	S, WQ, Cp,	3	11
P3	New Pond	600 Pardee Road	4	S,WQ, Cp,E	3	11
P4	New Pond	600 Pardee Road	4	S,WQ, Cp,E	3	11
O5	Other GI Project	350 Waring Rd C/o Roch Playground bioretention	4	Cr,WQ,Sc, E	2	10
O4	Other GI Project	C/o Rochester 940 Fernwood Pk -bioretention	4	Cr,WQ,Sc, E	1	10
O10	Other GI Project	Densmore Road Elementary Rain Garden	4	WQ,E, Sc	3	10
D3	Dry Pond Conversion	1550 Portland Ave.	3	S, WQ, Cp,	3	9
P6	Dry Pond Conversion	1945 East Ridge Road	3	F,WQ,Cp	3	9
N14	Neighborhood GI	Brookdale Subd	2	Cr,WQ,E,Sc	3	9
N4	Neighborhood GI	Culver Hills Subd	2	Cr,WQ,E,Sc	3	9
N7	Neighborhood GI	Culver Manor Subd	2	Cr,WQ,E,Sc	3	9
N16	Neighborhood GI	Culver Meadows	2	Cr,WQ,E,Sc	3	9
N18	Neighborhood GI	Culver Ridge	2	Cr,WQ,E,Sc	3	9
N3	Neighborhood GI	Culver Road Subd	2	Cr,WQ,E,Sc	3	9
N8	Neighborhood GI	Densmore Heights Northeast	2	Cr,WQ,E,Sc	3	9
N15	Neighborhood GI	Densmore Heights Southwest	2	Cr,WQ,E,Sc	3	9
N6	Neighborhood GI	Echo Hill Subd	2	Cr,WQ,E,Sc	3	9
N2	Neighborhood GI	Edgewood Sub -	2	Cr,WQ,E,Sc	3	9
N24	Neighborhood GI	HL Perrigo Subd	2	Cr,WQ,E,Sc	3	9

Densmore Creek Retrofit Ranking List (Continued)

Map ID	Project Type	Project Location	Feasibil-ity	Environmental Benefits	Cost Effectiveness	Total Score
N13	Neighborhood GI	Merrydale Subd	2	Cr,WQ,E,Sc	3	9
N17	Neighborhood GI	Newport Heights	2	Cr,WQ,E,Sc	3	9
N12	Neighborhood GI	North GoodmanPark	2	Cr,WQ,E,Sc	3	9
N19	Neighborhood GI	Norton Park	2	Cr,WQ,E,Sc	3	9
N22	Neighborhood GI	Perrin Estates	2	Cr,WQ,E,Sc	3	9
N20	Neighborhood GI	Portland Park	2	Cr,WQ,E,Sc	3	9
N9	Neighborhood GI	SchumCroft Subd	2	Cr,WQ,E,Sc	3	9
N11	Neighborhood GI	Spartan Heights	2	Cr,WQ,E,Sc	3	9
P5	New Pond	32 Portland Parkway	3	Sc, WQ, I	3	9
P1	New Pond	Perrigo Street (Farm field near Creek)	3	S, WQ, Cp	3	9
O1	Other GI Project	285 Medley Center Parkway - IC reduction	5	Cr,WQ,Sc	2	9
O2	Other GI Project	500 Medley Center Parkway - IC reduction	5	Cr,WQ,Sc	2	9
O6	Other GI Project	C/O Rochester 155 Bleaker St -bioretention	4	Cr,WQ,Sc,	1	9
O15	Other GI Project	Retrofit cul-de-sac Alhambra Dr	3	I, WQ	3	9
O12	Other GI Project	Retrofit cul-de-sac Calsam Cir E	3	I, WQ	3	9
O13	Other GI Project	Retrofit cul-de-sac Carlsam Cir W	3	I, WQ	3	9
O22	Other GI Project	Retrofit cul-de-sac Cashmere Lane	3	I, WQ	3	9
O16	Other GI Project	Retrofit cul-de-sac Favara Cir	3	I, WQ	3	9
O17	Other GI Project	Retrofit cul-de-sac Granada Cir	3	I, WQ	3	9
O21	Other GI Project	Retrofit cul-de-sac Marco Lane	3	I, WQ	3	9
O14	Other GI Project	Retrofit cul-de-sac Moroa Dr	3	I, WQ	3	9
O8	Other GI Project	Retrofit cul-de-sac Nandor Circle	3	I, WQ	3	9
O19	Other GI Project	Retrofit cul-de-sac off Eagle Rock Dr	3	I, WQ	3	9
O23	Other GI Project	Retrofit cul-de-sac off Ransford Ave	3	I, WQ	3	9
O20	Other GI Project	Retrofit cul-de-sac San Rose dr	3	I, WQ	3	9
O18	Other GI Project	Retrofit cul-de-sac Venice Cir	3	I, WQ	3	9
O3	Other GI Project	2255 East Ridge Road - IC reduction	3	WQ,E, Sc	2	8
O11	Other GI Project	Bioretention at East Ridge HS	4	WQ,E, Sc	3	7


2350 East Ridge Road
New Pond Project (P2)
N
Ridge
0 20 40 80 Feet
Project Area
Stormsewer
Project Site
Densmore Parcels


NYSDOT 590 storage retrofits along ROW
New Pond Project (P14)
N
Rt 590
Rt 590 to EB Rt 104
Rt 104
Rt 104 to SB Rt 590
Rt 590
0
75
150
300 Feet
Project Area
Stormsewer
Densmore Parcels
Project Site


NYSDOT 590 storage retrofits along ROW
New Pond Project (P15)
N
590
0
50
100
200 Feet
Project Area
Stormsewer
Densmore Parcels
Project Site


NYSDOT 590 storage retrofits along ROW
New Pond Project (P10)
N
Rt 104
WB Rt 104
Rt 590
Rt 104 to SB Rt 590
0
75
150
300 Feet
Project Area
Stormsewer
Project Site
Densmore Parcels
Densmore Creek


NYSDOT 590 storage retrofits along ROW
New Pond Project (P11)
N
Rt 590
Rt 590
Rt 590 to WB Rt 104
0
50
100
200 Feet
Project Area
Stormsewer
Densmore Parcels
Project Site
Densmore Creek


NYSDOT 590 storage retrofits along ROW
New Pond Project (P12)
N
Morse
Rt 590
Rt 590
Rt 590
Rt 104
Rt 590 to WB Rt 104
Rt 104
Rt 104 to SB Rt 590
0
100
200
400 Feet
Project Area
Stormsewer
Densmore Parcels
Project Site
Densmore Creek


NYSDOT 590 storage retrofits along ROW
New Pond Project (P13)
N
Rt 104
4 to SB Rt 590
Rt 590
Rt 590
Rt 590 to WB Rt 104
0
55
110
220 Feet
Project Area
Stormsewer
Densmore Parcels
Project Site
Densmore Creek

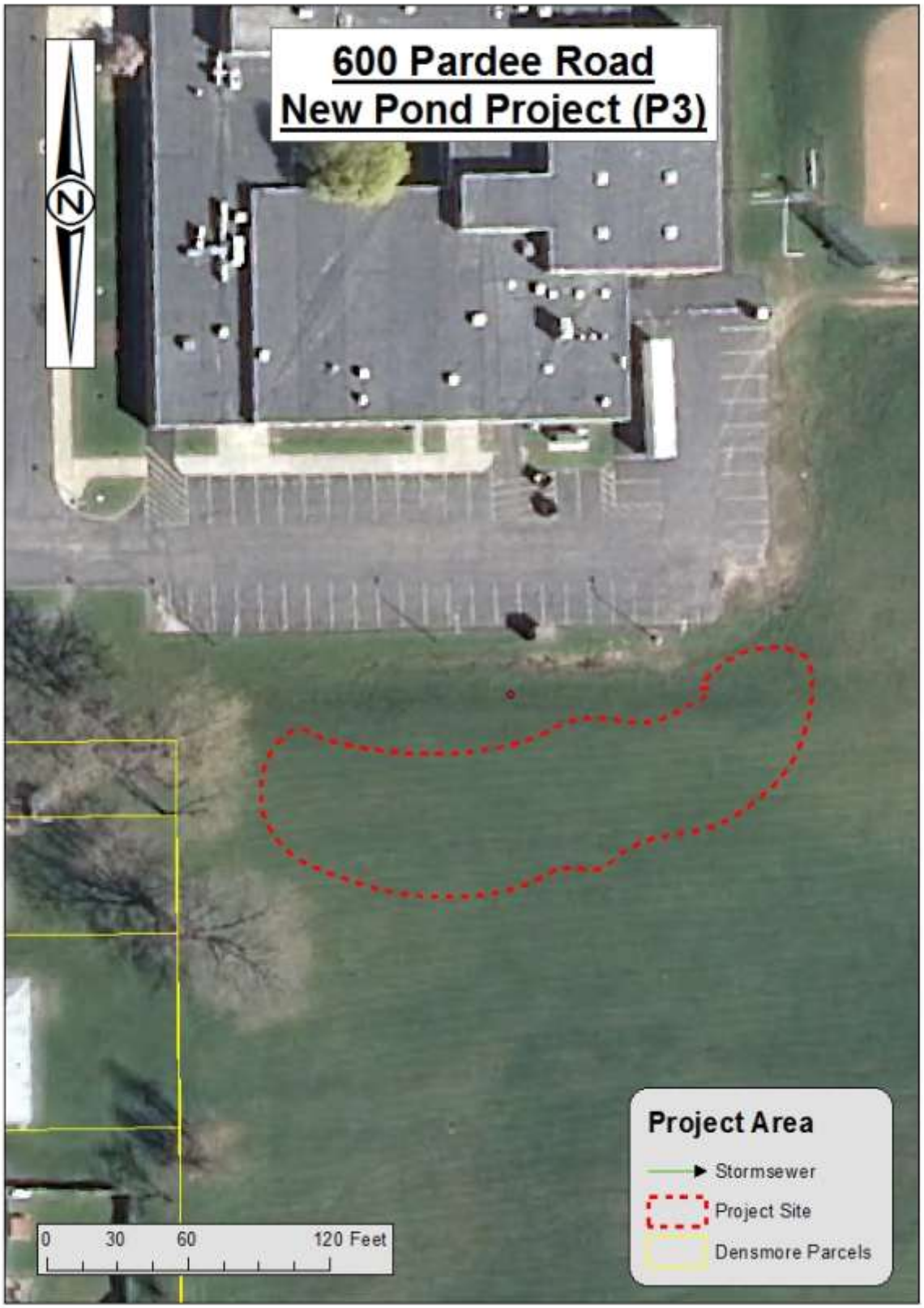

NYSDOT 590 storage retrofits along ROW
New Pond Project (P8)
N
Rt 590
Rt 590
Rt 590 to Norton St
0
50
100
200 Feet
Project Area
Stormsewer
Project Site
Densmore Parcels

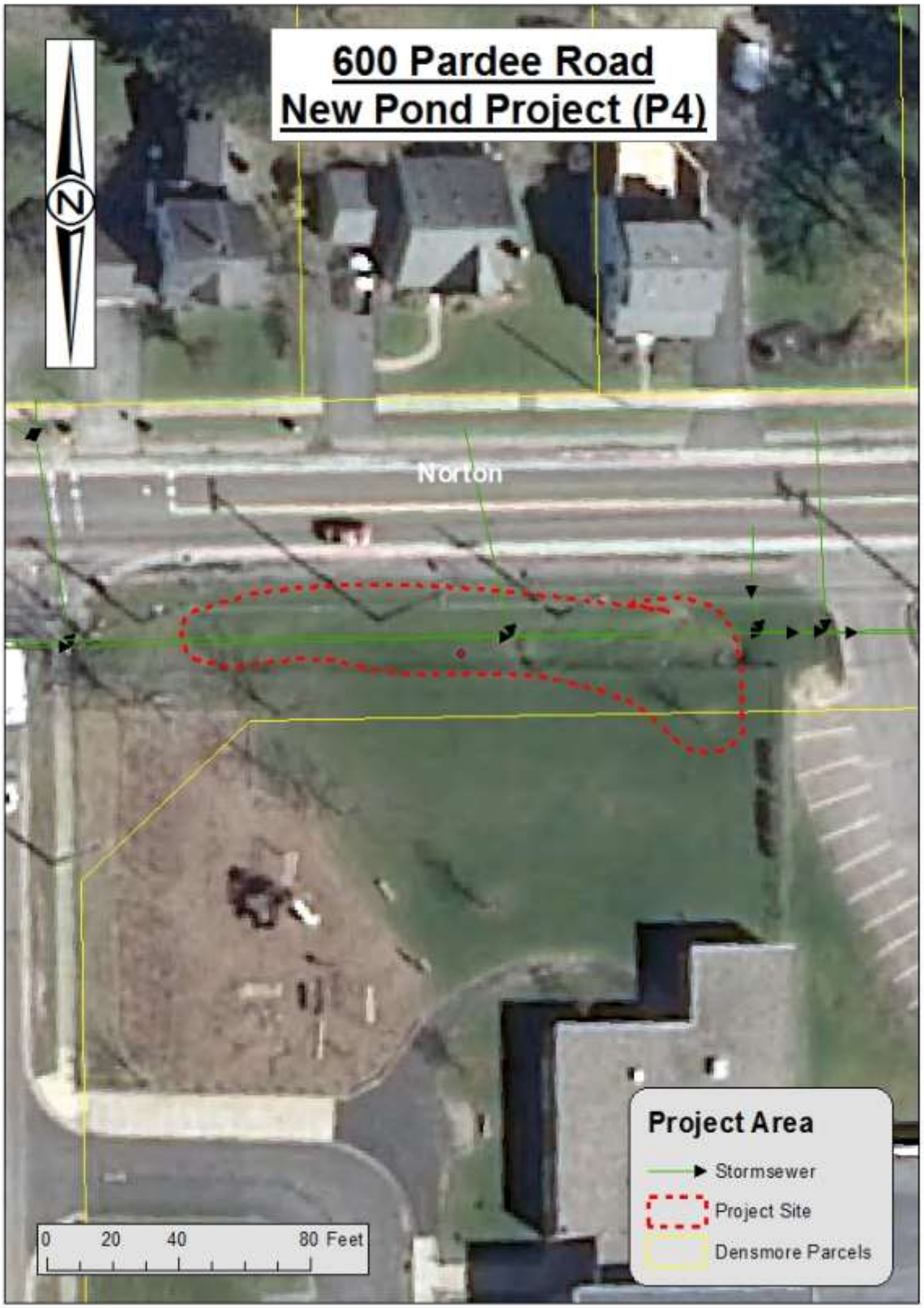

NYSDOT 590 storage retrofits along ROW
New Pond Project (P9)
N
Rt 590
Rt 590
0
30
60
120 Feet
Project Area
Stormsewer
Project Site
Densmore Parcels
Densmore Creek


Town of Irondequoit Eagle Rock Dr.
New Pond Project (P16)
N
0
75
150
300 Feet
Project Area
Stormsewer
Densmore Parcels
Project Site
Densmore Creek

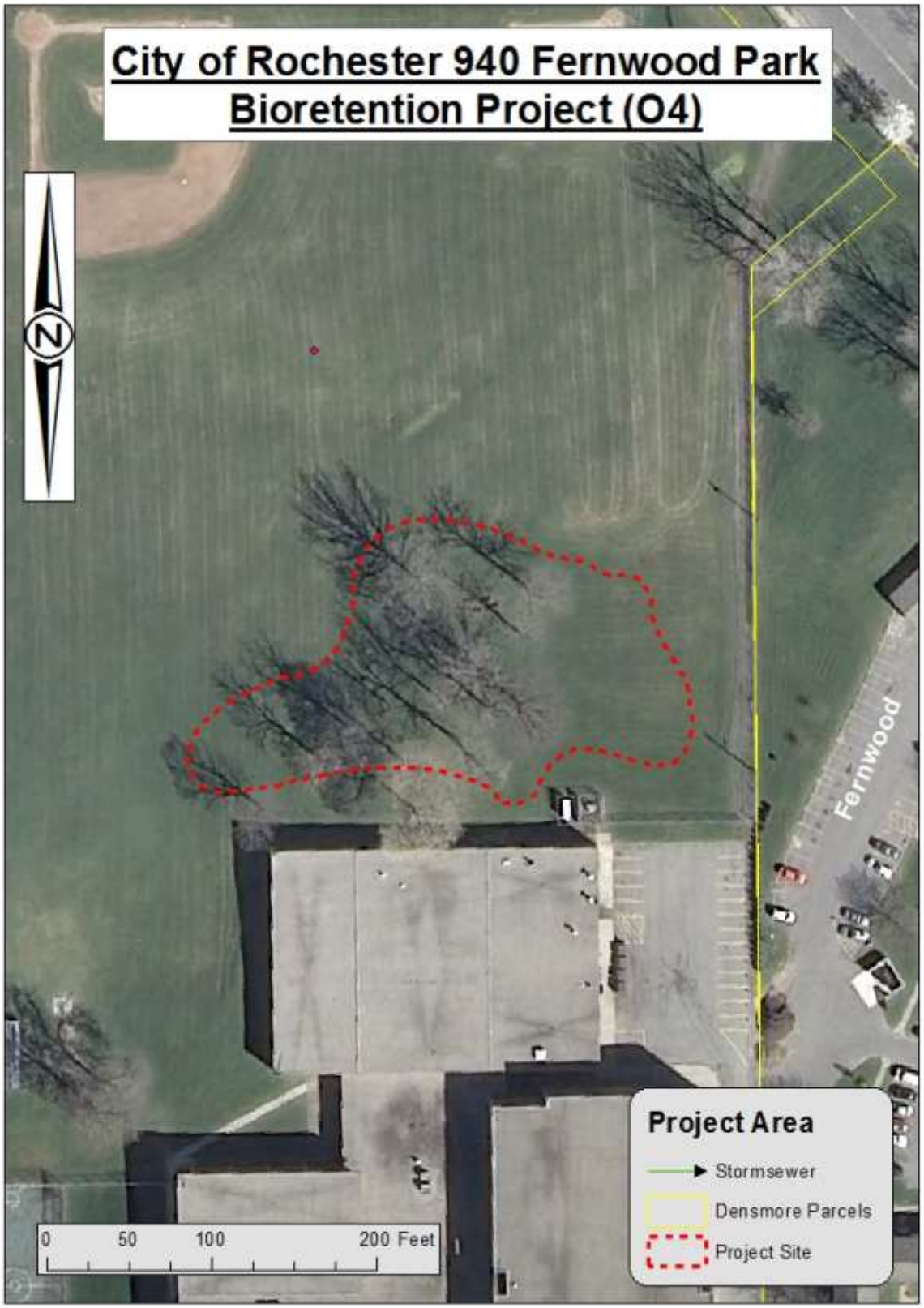

2621 Culver Road
New Pond Project (P7)
N
La Croix Court
0 20 40 80 Feet
Project Area
Stormsewer
Project Site
Densmore Parcels


285 Medley Center Parkway
Dry Pond Project (D2)
N
Medley Centre
Vint
0
50
100
200 Feet
Project Area
Stormsewer
Project Site
USACE Wetlands
Densmore Parcels


600 Pardee Road
New Pond Project (P3)
N
0
30
60
120 Feet
Project Area
Stormsewer
Project Site
Densmore Parcels

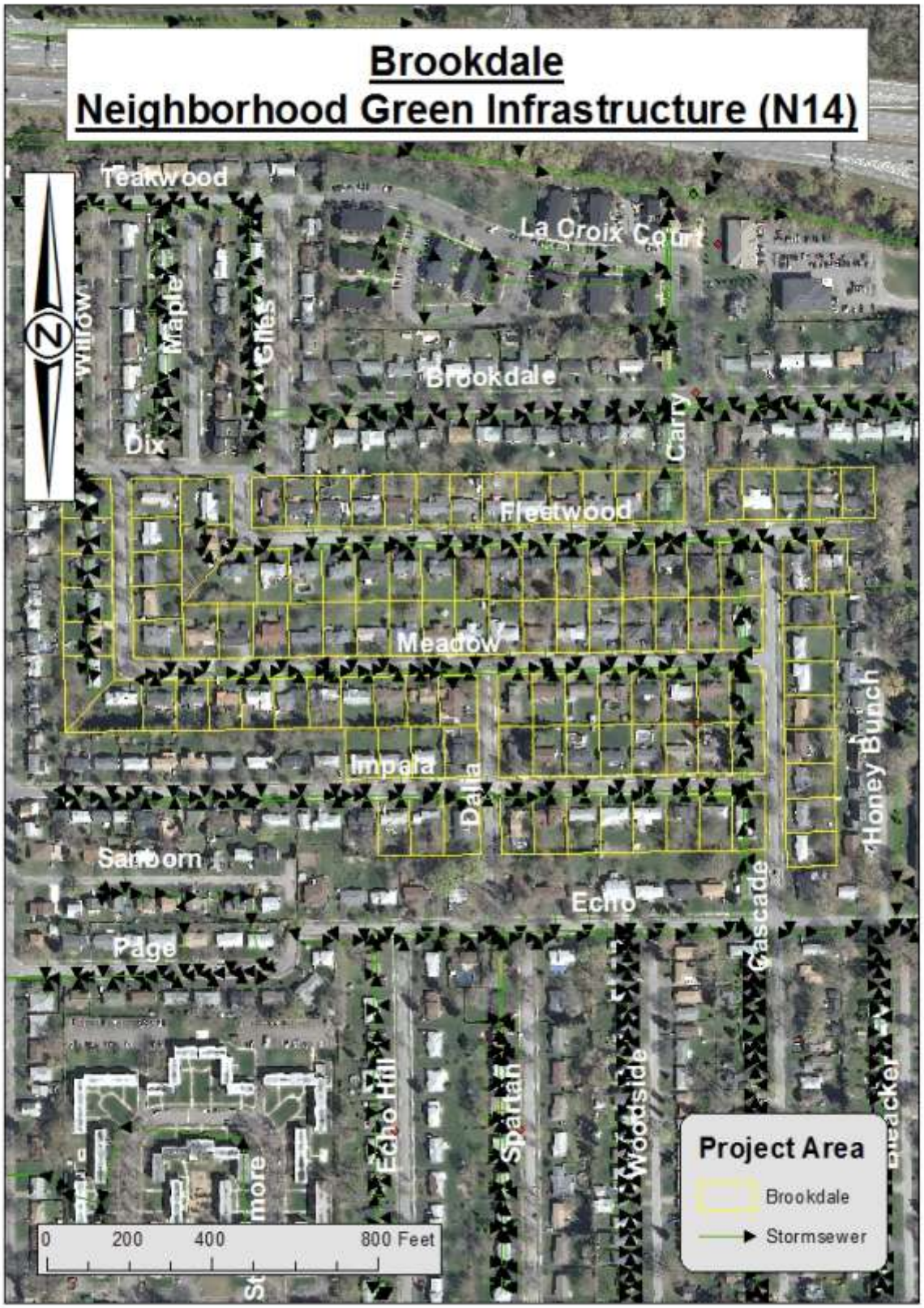

600 Pardee Road
New Pond Project (P4)
N
Norton
0 20 40 80 Feet
Project Area
Stormsewer
Project Site
Densmore Parcels


350 Waring Road City of Rochester Playground
Bioretention Project (O5)
N
Costich
0
30
60
120 Feet
Project Area
Stormsewer
Densmore Parcels
Project Site


City of Rochester 940 Fernwood Park
Bioretention Project (O4)
N
Fernwood
0
50
100
200 Feet
Project Area
Stormsewer
Densmore Parcels
Project Site


1550 Portland Ave.
Dry Pond Project (D3)
N
104 to N Goodman St
Rt 104 Service
St Anns
0
25
50
100 Feet
Project Area
Stormsewer
Project Site
Densmore Parcels


1945 East Ridge Road
New Pond Project (P6)
N
0
30
60
120 Feet
Project Area
Stormsewer
Project Site
Densmore Parcels


Brookdale
Neighborhood Green Infrastructure (N14)
Teakwood
La Croix Court
Willow
Maple
Giles
Brookdale
Dix
Carry
Fleetwood
Meadow
Impala
Dalia
Honey Bunch
Sanborn
Echo
Cascade
Page
Echo Hill
Spartan
Woodside
Project Area
Brookdale
Stormsewer
0
200
400
800 Feet


Culver Hills
Neighborhood Green Infrastructure (N4)
Fleetwood
Meadow
Impala
Dalia
Honey Bunch
Echo
Cascade
Echo Hill
Spartan
Woodside
Bleacker
Norton
Village
Norton Village
Crossfield
Project Area
Stormsewer
Culver_Hills
0
200
400
800 Feet
N


Culver Manor
Neighborhood Green Infrastructure (N7)
N
Rt 104
Rt 104 to Culver Road
Rt 104
Road to EB Rt 104
Carlsam
Whitlock
Heberle
Hulda
Densmore
Wahl
Leslie
Burt
Andrea
Astronaut
Auraman
Culver
Cashmere
Norton
0
265
530
1,060 Feet
Project Area
Culver_Manor
Stormsewer
Densmore Creek


Culver Meadows
Neighborhood Green Infrastructure (N16)
N
Russell
Ransford
Angelus
Forest
Walnut
Ranch
Alhambra
Morea
Breton
Brewer
Del Rio
Caren
Gladmar
Rt 104
Rt 104 to Culver Road
Culver Road to EB Rt 104
Carlsam
Project Area
Stormsewer
Culver_Meadows
0
290
580
1,160 Feet


Culver Ridge
Neighborhood Green Infrastructure (N18)
N
Perrin
William
Culver
Vinton
Medley Centre
Heberton
Rt 104 Service
0
150
300
600 Feet
Project Area
Stormsewer
Culver_Ridge

References:

Center for Watershed Protection. 2004a. *Unified Stream Assessment: A User's Manual*. Manual 10 in the Urban Subwatershed Restoration Manual Series. Center for Watershed Protection, Inc. Ellicott City, MD.

2004b. *Unified Subwatershed and Site Reconnaissance: A User's Manua*l. Manual 11 in the Urban Subwatershed Restoration Manual Series.

2005. *An Integrated Framework to Restore Small Urban Streams User's Manua*l. Manual 1 in the Urban Subwatershed Restoration Manual Series.

2007. *Stormwater Retrofit Practices*. Manual 3 in the Urban Subwatershed Restoration Manual Series.

Dufresne-Henry. 2003. *Irondequoit Bay Harbor Management Plan*

New York State Department of Environmental Conservation. 2004. *Lake Ontario (Minor Tribs) Basin Waterbody Inventory/Priority Waterbodies List (revised 2007).*

2012. *Waterbody Inventory/Priority Waterbodies List (revised 2013, NYSDEC).*

(RCSI 1967).

Stormwater Coalition of Monroe County. 2013. *Green Infrastructure Rapid Assessment Plan Glen Haven Creek Watershed.*

2013. *Green Infrastructure Rapid Assessment Plan Tufa Glen Creek Watershed.*

APPENDIX A

NYSDEC PWL Datasheet

Minor Tribs to Irondequoit Bay (0302-0038) — Impaired Seg

Waterbody Location Information

Revised: 05/04/2007

Water Index No: Ont 108/P113- 1 thru 6 (selected)
Hydro Unit Code: 04140101/020 **Str Class:** C
Waterbody Type: River (Low Flow)
Waterbody Size: 9.7 Miles
Seg Description: total length of smaller/selected tribs

Drain Basin: Lake Ontario
Irondequoit/Ninemile
Reg/County: 8/Monroe Co. (28)
Quad Map: ROCHESTER EAST (I-10-2)

Water Quality Problem/Issue Information

(CAPS indicate MAJOR Use Impacts/Pollutants/Sources)

Use(s) Impacted	Severity	Problem Documentation
AQUATIC LIFE	Impaired	Suspected
RECREATION	Impaired	Suspected

Type of Pollutant(s)

Known: NUTRIENTS (phosphorus)
Suspected: D.O./OXYGEN DEMAND, PATHOGENS
Possible: - - -

Source(s) of Pollutant(s)

Known: URBAN/STORM RUNOFF
Suspected: MUNICIPAL (unknown), ON-SITE/SEPTIC SYST
Possible: Other Sanitary Disch

Resolution/Management Information

Issue Resolvability: 1 (Needs Verification/Study (see STATUS))
Verification Status: 3 (Cause Identified, Source Unknown)
Lead Agency/Office: DOW/Reg8
TMDL/303d Status: 3b*

Resolution Potential: Medium

Further Details

Aquatic life support and recreational uses of Densmore Creek is thought to be limited by sewage inputs and various urban runoff impacts. Various nonpoint urban and stormwater runoff sources are suspected of causing water quality impacts to most of the smaller minor tribs to the bay.

A biological (macroinvertebrate) assessment of Densmore Creek in Newport (at Bayshore Drive) was conducted in 1999. Sampling results indicated moderately impacted water quality conditions. Impact Source Determination identified sewage wastes as the primary factor affecting the fauna. (DEC/DOW, BWAM/SBU, January 2001)

This segment includes the total length of selected/smaller tribs to Irondequoit Bay. Tribs within this segment, including Densmore Creek (-5), are Class C. Irondequoit Creek (-3) is listed separately.

APPENDIX B

Potential Stormwater Hotspots in the Densmore Creek Watershed

Stormwater hotspots are defined as commercial, municipal, industrial, institutional or transport related operations that produce higher levels of stormwater pollutants, and may present a higher than normal risk for spills, leaks, or illicit discharges. In many cases, a hotspot exists on private property where a change in how the facility is managed is all that is required to prevent stormwater pollution. Pollution prevention is a term commonly used for hotspots and refers to reducing or eliminating the generation of pollutants where they are generated. Another term used is "good housekeeping", meaning a practical and cost-effective way to maintain a clean and orderly facility, in order to prevent potential pollution sources from coming into contact with stormwater. Good housekeeping practices of a potential hotspot also help to enhance safety and improve the overall work environment. An example is a paving and construction company off Ridge Road. Runoff from the paved areas goes untreated to the creek through storm sewers (Figure C-1).

Using the watershed parcel records and the parcel property class description, potential hotspots were identified, mapped and listed (Figure C-2 and Table C-1 respectively). Property uses include trucking, gas stations, auto washing, storage, repair and recyclers, minimarts, and fast food restaurants. Pollution prevention methods will vary greatly depending on the type of facility, but could include better handling of automotive fluids at an auto recycling yard or installing a canopy over a gas station's fueling island. The goal is to have the facility owners implement site specific practices to treat the quality of runoff from all severe stormwater hotspots using existing authority under industrial and/or municipal stormwater permits, since hotspot runoff may violate water quality standards and warrants abatement.

Figure C-1: A mixed use industrial area is a potential hotspot

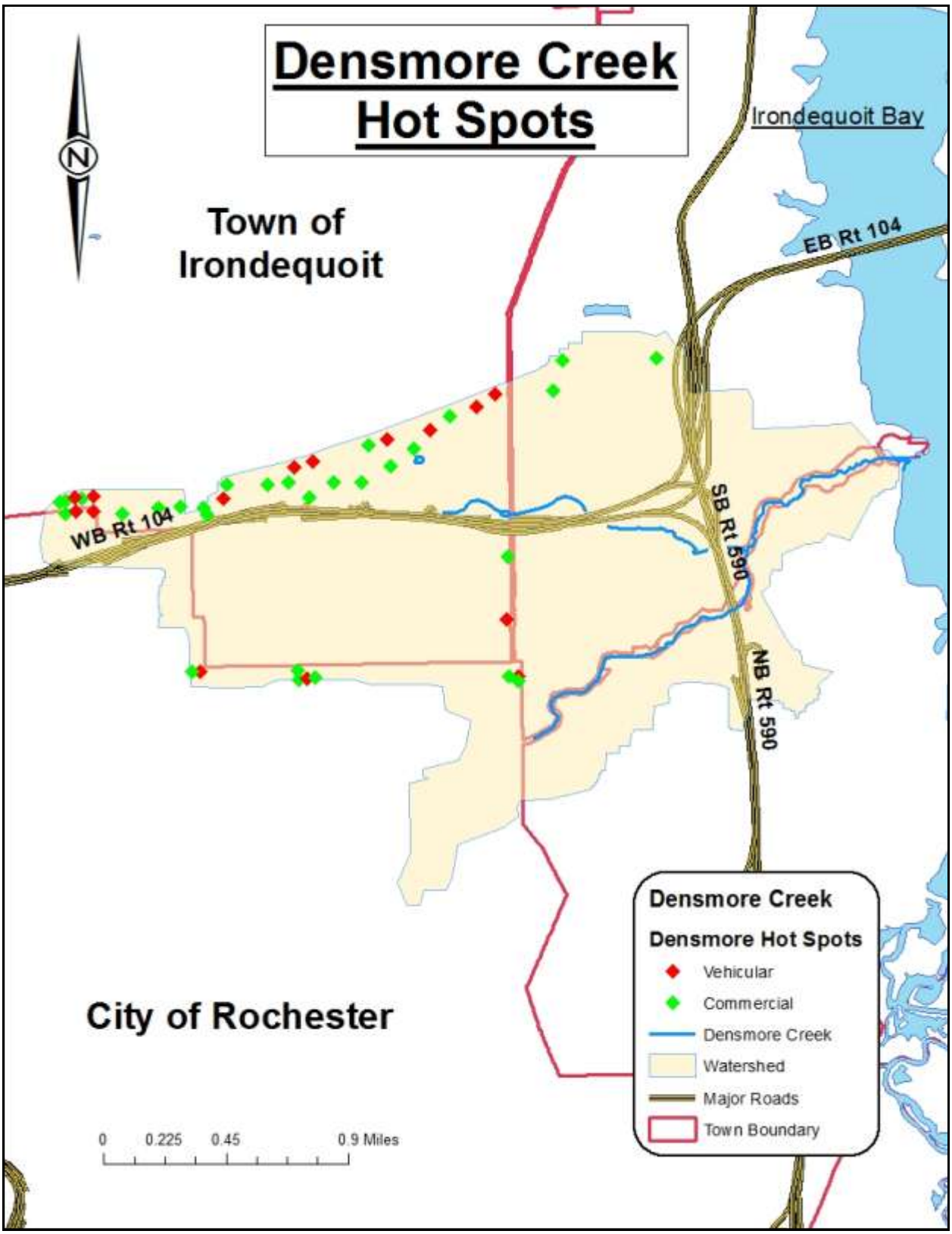


Figure C-2: Locations of potential hotspot within the Densmore Creek watershed.

Table C-1. List of Potential Hotspot Locations - Densmore Creek Watershed		
Location	**Property Class**	**Property Description**
2265 NORTON ST	433	Auto body
1968 E RIDGE ROAD	433	Auto body
1672 E RIDGE ROAD	433	Auto body
70 DUBELBEISS LANE	433	Auto body
1301 E RIDGE ROAD	433	Auto body
1480 E RIDGE ROAD	433	Auto body
1502 E RIDGE ROAD	433	Auto body
1985 E RIDGE ROAD	433	Auto body
2025 E RIDGE ROAD	431	Auto dealer
1700 E RIDGE ROAD	431	Auto dealer
1733 E RIDGE ROAD	431	Auto dealer
2299 CULVER ROAD	426	Fast food
1517 E RIDGE ROAD	426	Fast food
1571 E RIDGE ROAD	426	Fast food
1599 E RIDGE ROAD	426	Fast food
1802 E RIDGE ROAD	426	Fast food
1175 E RIDGE ROAD	426	Fast food
2417 CULVER ROAD	432	Gas station
2272 CULVER ROAD	432	Gas station
1541 E RIDGE ROAD	432	Gas station
1495 E RIDGE ROAD	432	Gas station
2075 E RIDGE ROAD	432	Gas station
2458 E RIDGE ROAD	453	Large retail
2575 CULVER ROAD	486	Mini-mart
1304 E RIDGE ROAD	452	Neighborhood Shopping Center
1381 E RIDGE ROAD	452	Neighborhood Shopping Center
2255 E RIDGE ROAD	452	Neighborhood Shopping Center
1780 E RIDGE ROAD	452	Neighborhood Shopping Center
2270 CULVER ROAD	421	Restaurant
1925 E RIDGE ROAD	421	Restaurant
1313 E RIDGE ROAD	421	Restaurant
1683 E RIDGE ROAD	421	Restaurant
1930 E RIDGE ROAD	421	Restaurant
2200 E RIDGE ROAD	454	Supermarket
1455 E RIDGE ROAD	454	Supermarket

APPENDIX C

Potential Stream Repair Projects in the Densmore Creek Watershed

Figure D-1: Streams need naturalized buffers to protect aquatic habitat and maintain water quality (Source, Philadelphia Water Department).

Stream Repairs include physical modifications to stream channels, banks, and in-stream habitat to repair and improve degraded or unstable conditions. The project objectives are to reduce streambank erosion, recover biological diversity of a naturalized stream, protect threatened infrastructure such as adjacent homes or roads, and to add community resources, aesthetics and recreation opportunities (Figure D-1).

In 2000, the Monroe County Soil & Water Conservation District began a streambank and shoreline erosion assessment program (SEAP) to inventory, assess, and prioritize erosion sites with the expertise of SUNY Geneseo's Dr. Richard Young and local knowledge of town and village highway superintendents, who were asked to identify their most severe erosion sites. The severity of each site was evaluated by measuring its physical properties such as area of eroded bank, stream hydrology, and geology. Limited grant funding over the years has allowed some of these sites to be repaired. The data from this program has been entered into the County's GIS database and was used to identify potential projects in this watershed. Additional sites were located using aerial imagery analysis and limited field surveys of the watershed (Figure D-2, Table D-1). A recommendation is that at some future date the sites listed be visited and evaluated by technical staff in order to a) determine the extent of the repair needed, b) define the specific needed repair project and cost and c) rank projects according to an agreed prioritization criteria.

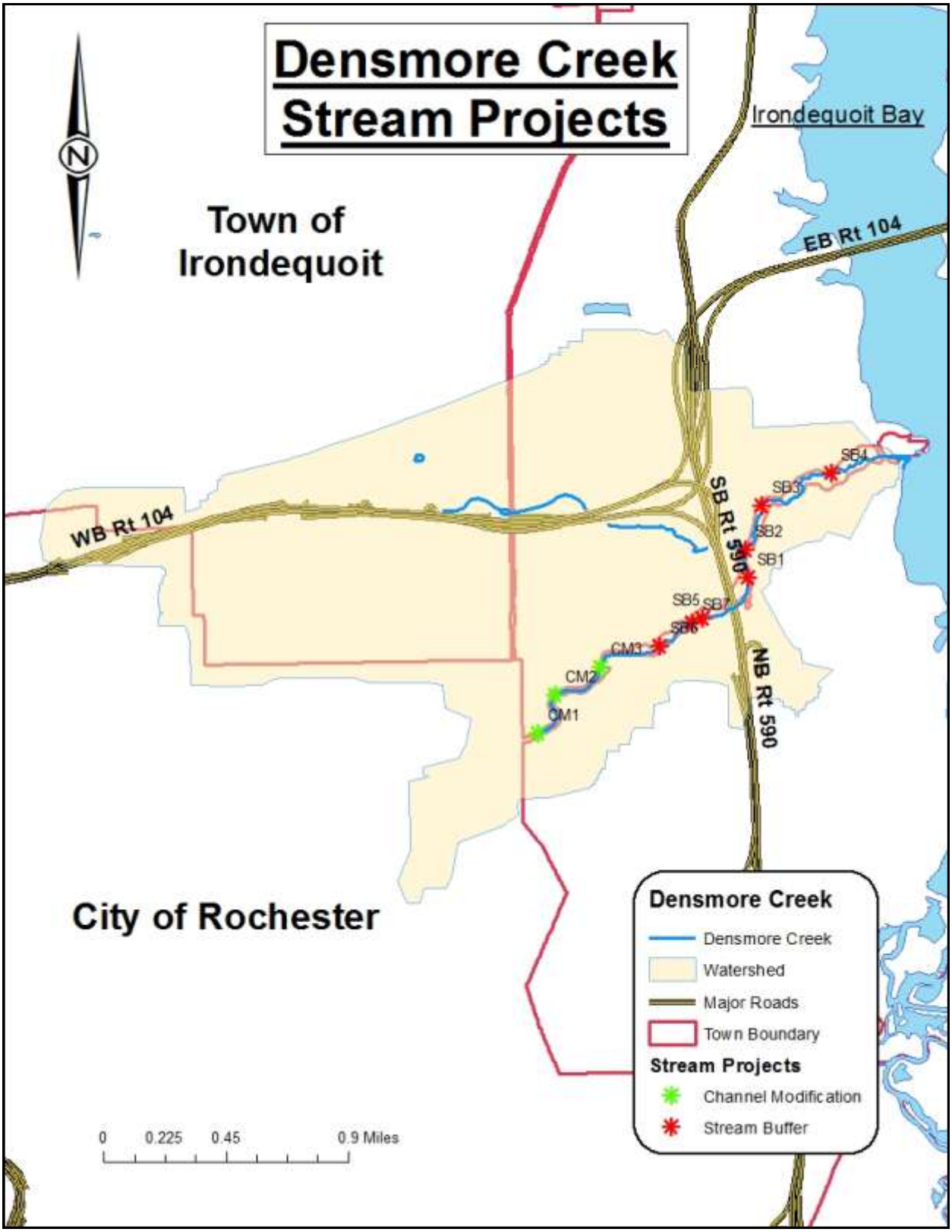


Figure D-2: Locations of Potential Stream Repair Projects

Potential Stream Repairs Project Types:

- Stream Channel Modification: As areas become more urbanized, stream channels are frequently straightened and stream banks are armored in order to accommodate additional growth. Channel modification projects attempt to restore a natural meandering path, gently sloped banks and strategically placed obstructions within the stream channel to create variable habitat.
- Stream Buffers: Urbanized streams frequently are disconnected from their flood plain or have development, such as pavement or lawns, right up to the stream bank. These factors have negative effects on the stability of the stream in terms of bank erosion, and stream health. Stream buffer projects create a vegetated zone along a length of stream that acts as a filter for incoming runoff and adds space for the stream to meander and rise to minimize erosion and property
  damage.
- Streambank Stabilization: There are numerous streambank erosion sites in Monroe County which deliver significant quantities of sediment and associated pollutants to our local water resources. Streambank stabilization projects can help reduce the delivery of sediment and nutrients from bank erosion and include both hard armoring the banks but can also include bioengineered practices on smaller streams and tributaries.

Table D-1. Potential Streambank Repair Projects - Densmore Creek watershed

Location		Repair Type
2000 Culver Road	CM1	channel modification
98 Nandor Drive	CM2	channel modification
Behind 2535 Norton Street	CM3	channel modification
Behind 35 Simone Circle	SB1	Stream buffer
Driveway off East Ridge Road near I-590	SB2	stream buffer
Behind 135 Granada Circle	SB3	stream buffer
Across stream from 1372 Bay Shore Road	SB4	stream buffer
Behing 2750 Norton Street	SB5	stream buffer
82 densmore road	SB6	stream buffer
Behind 150 Densmore Road	SB7	stream buffer