Green Infrastructure Rapid Assessment Plan

Glen Haven Creek

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

June 2013

Table of Contents

Cover Photo: Upper –below NYS Rt 590 in Irodequoit Bay Park West

List of Abbreviations

cfs	cubic feet per second
CWP	Center for Watershed Protection
E	Education
EMC	Event Mean Concentration
EPA	US Environmental Protection Agency
GI	Green Infrastructure
GIS	Geographic Information System
GPS	Global Positioning System
IC	Impervious Cover
I	Infiltration
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
POC	Pollutant of Concern
S	Flood Storage
CP	Channel Protection
CR	Community Revitalization
Sc	Source Control
SWAAP	Stormwater Assessment and Action Plan
RH	Riparian Habitat
Wq	Water Quality
WS	Watershed
USGS	US Geological Survey

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 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 harmed 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 this the Rapid Green Infrastructure Assessment Plan (Plan). Due to limited funding, a 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, have the potential to 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. These files are listed and described in Appendix A. 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:

This tributary has no name on record. For this report, it was given the name Glen Haven Creek because it discharges at a point bar where the famous Glen Haven Hotel once stood on the shore of Irondequoit Bay (Figure 1). The Creek originates in the northeast portion of the city of Rochester NY, flows northeasterly through the town of Irondequoit, down a long embankment of mature hardwood to Irondequoit Bay (Figure 2). Approximately half of its length is protected in Irondequoit Bay Park West—a 147 acre county park, The actual watershed size of 885 acres is considerably smaller than would naturally drain to this watershed since a portion drains to the Rochester Combined Sewer System (see "Combined Sewer System" section 1.4.1 below). The watershed's predominate land use is residential with some commercial area along Empire Blvd (Figure 3). There is 50 percent impervious cover and most of its length piped. Table 1 lists other relative watershed statistics. piped.

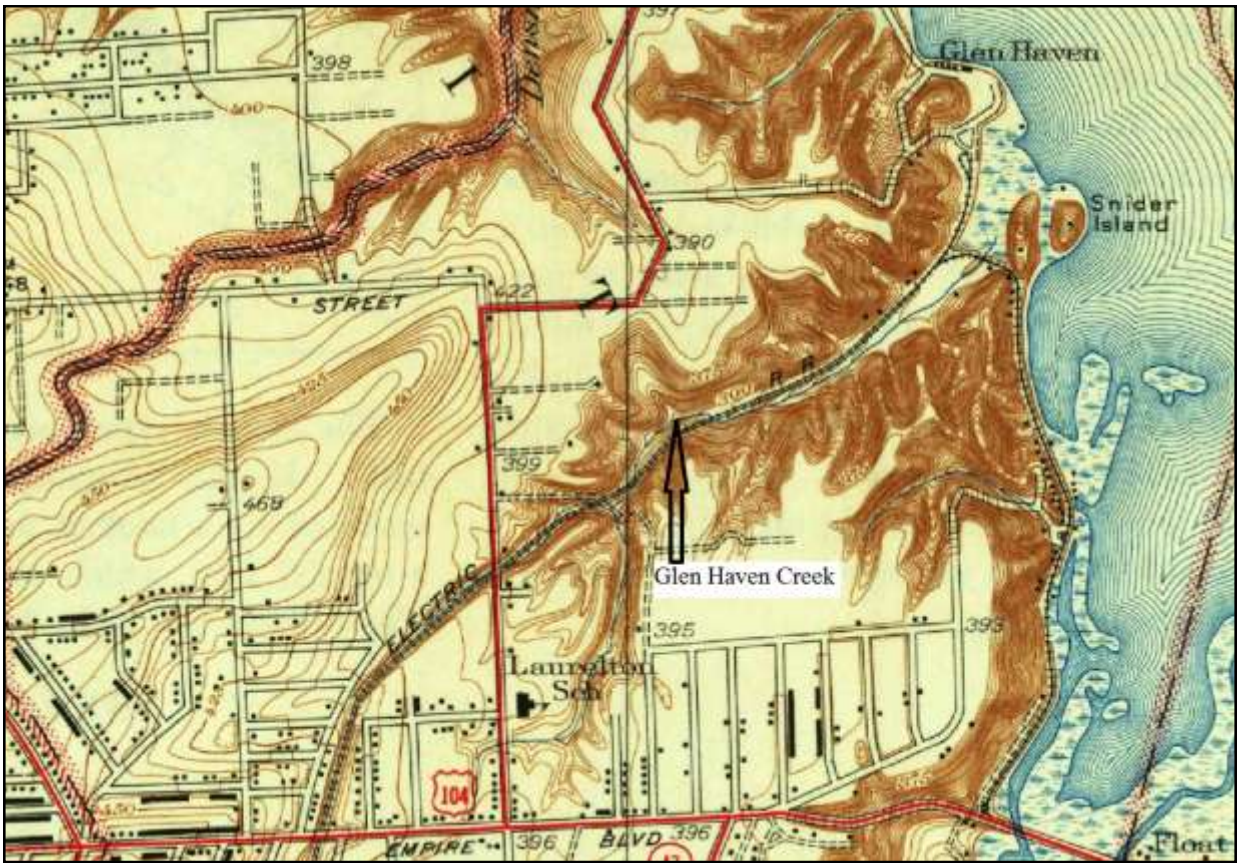

Figure 1: 1935 USGS map showing rail line to Glen Haven

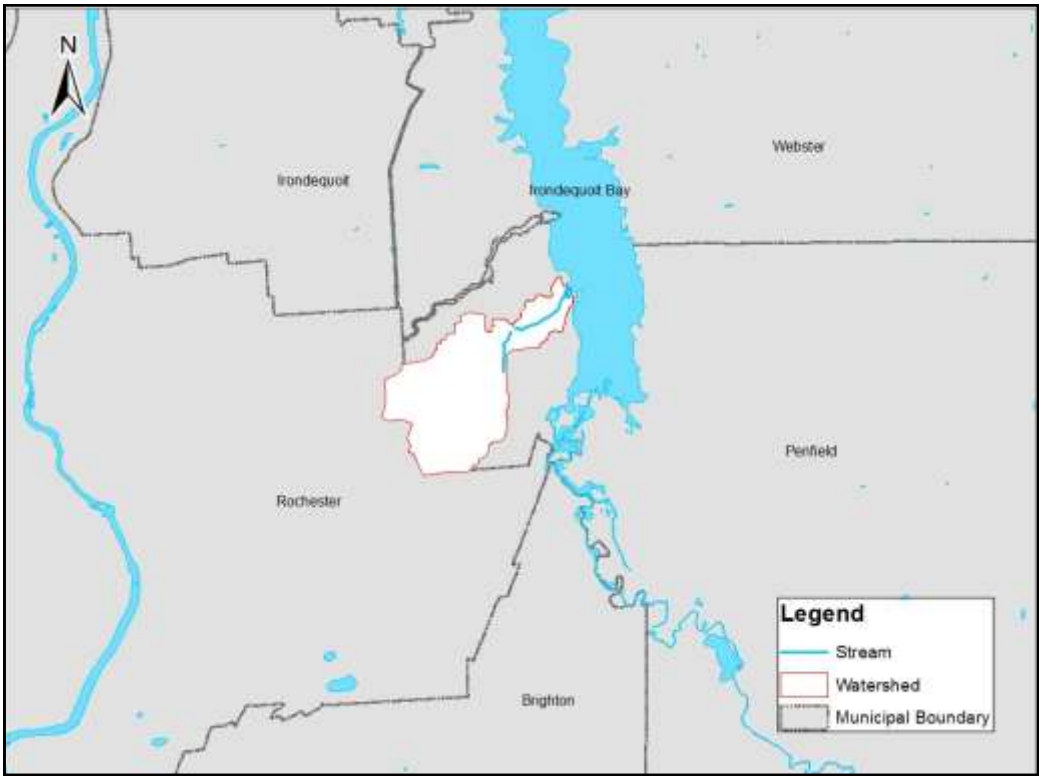

Figure 2: Glen Haven Creek Watershed.

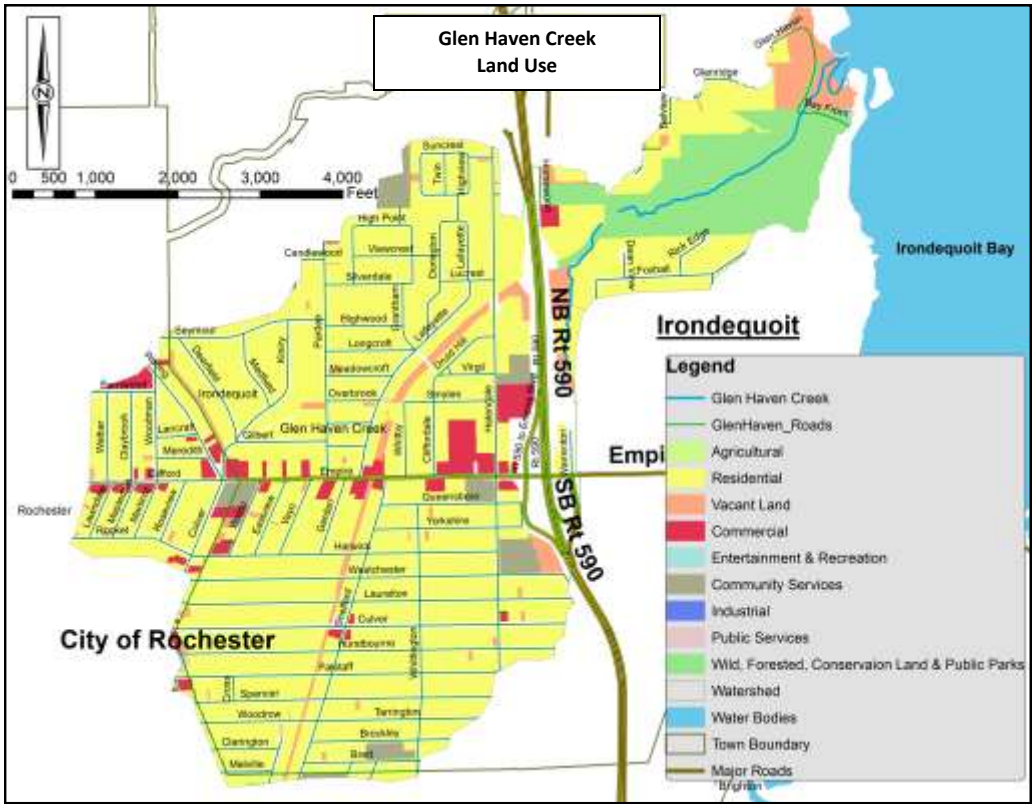

Figure 3: Land use within Glen Haven Creek Watershed.

Table 1. Watershed Data	
Metric	**Value**
Area	885
Mapped Stream Length	1.3 miles current, 1.7 miles historic
Percent of Stream Channelized	21
Primary/secondary land use	Residential/Park lands
Land Use (percent of watershed)	
Agricultural	0
Residential	60
Vacant Land	5
Commercial	3
Recreation & Entertainment	0
Community Service (utilities)	<1
Industrial	0
Public Services (schools)	3
Wild, Forested, Conservation Lands & Public Parks	8
Roads	21
# of Stormwater Treatment Ponds	0
# of Stormwater Outfalls	24
Current Impervious Cover (%)	50
Estimated Future Impervious Cover (%)*	51
Wetland acres	10
Municipal Jurisdiction	Irondequoit 71%, City of Rochester 29%

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)".* Glen Haven Creek is not mentioned in the text of the full waterbody datasheet (Appendix B) that includes data on all three minor tributaries to Irondequoit Bay (Glen Haven, Densmore 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). The Regulations also state that some other restoration strategy may be allowable. 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. Pollutants noted on the 303d list for the Minor Tributaries of Irondequoit Bay are oxygen demand, urban runoff, and phosphorus from municipal sources. Adding to the complexity of the 303d process is how the list is sectioned based on how much information the state has on the severity of the waterbody's impairment. The three tributaries fall in the category of a **"**Waterbody for which TMDL Development May be Deferred (Requiring Verification of Cause/Pollutant)". Very little chemical or biological sampling of this stream is known to exist.

Combined Sewer System (CSS). Rochester, like many industrial cities in the early 20th century, installed sewage collection systems using a single-pipe system or, CSS which collects both sewage and urban runoff from streets and roofs. At a time before sewage treatment plants and little perceived public health issues, the city planners' rationale was that it would be cheaper to build a single system. Combined sewer systems are found throughout the United States but are most heavily concentrated in the Northeast and Great Lakes regions. In the Glen Creek Watershed, the older urban areas along the current upper watershed limits would (under natural drainage conditions), be part of the watershed. Today, the CSS in these areas are piped to the Frank E. Van Lare Wastewater Treatment Plant that treats the combined inffluent before discharging to Lake Ontario. An estimated additional 100 acres would drain naturally to the watershed from the upper (southwest) portion.

Another report that references Glen Haven Creek's water resource value is the Irondequoit Bay Harbor Management Plan (Dufresne-Henry 2003) which discusses the Creek's connection to Irondequoit bay: *"The Glen Haven/Snider Island Complex also retains much of its wildlife habitat. The transition to a unique forested upland area and the fact that the upland areas are publicly owned and have remained undeveloped creates a site used by waterfowl, fur-bearers and upland birds. The mature forest of oak and beech provides an ample food supply for a variety of animals. The flowing creek adds to the habitat's attractiveness for songbirds."*

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 and has been confirmed by nearly 60 peer-reviewed stream research studies (Figure 4) . The ICM shows that stream quality decline becomes evident when the watershed impervious cover exceeds ten percent. Glen Haven has an average of 50 percent impervious cover placing stream quality somewhere between poor and fair and non supporting for aquatic life. Based on current zoning, future impervious cover (over the next 20 years) will increase by 1 percent.

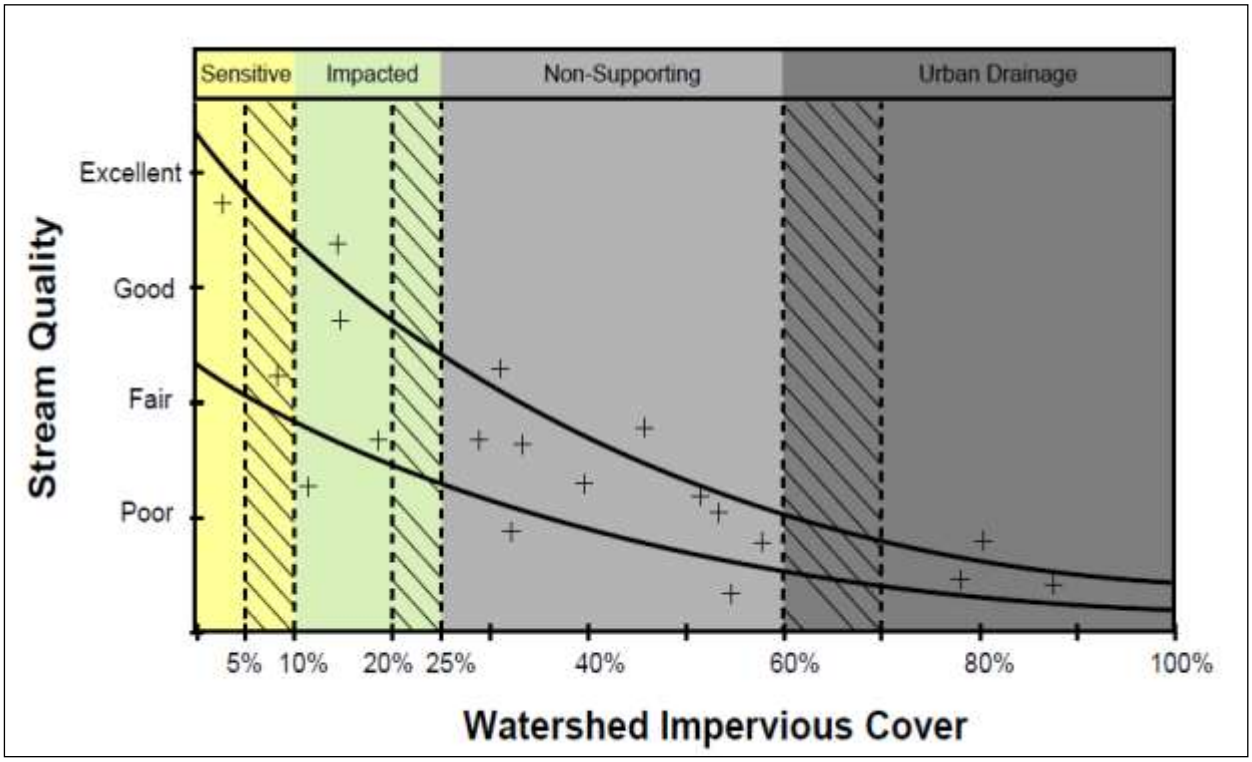

Figure 4. Impervious Cover Model (based on current zoning, future impervious cover over the

1.4.4 Streambank Erosion The Creek has numerous locations of eroding streambanks and has been piped through most of the developed portions of the watershed. Several significant eroding sections exist downstream of NYS Route 590. Annually, large storms cause the Creek to overtop South Glen Road due to large gravel depositions from the eroding streambanks upstream (Figure 5). High velocities are apparent from boulders displaced in the creek bed (Figure 6).

Figure 5. Upstream erosion of glacially laid gravels regular deposit at these twin culvert pipes on South Glen Road, Irondequoit, NY

Figure 6. Severe streambank erosion on Glen Haven Creek, exists through much of the section in Irondequoit Bay Park West.

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, their ability to absorb stormwater. Infiltration practices installed in the upper parts of a watershed can prevent and reduce flooding, drainage problems, and streambank erosion as well as greatly improve water quality in streams. 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. The amount of each soil type in Glen Haven Creek is: A soils 0%; B soils 15%; C soils 3%; D soils 2%, altered/urban 80% (Figure 6).

This desktop analysis of mapped soils is insufficient to determine whether infiltration-type stormwater retrofits, such as bioretention, would function here. It is known that much of the soils in the upper plateau areas surrounding Irondequoit Bay are well drained sands so field testing of soils using standard percolation soils testing is recommended.

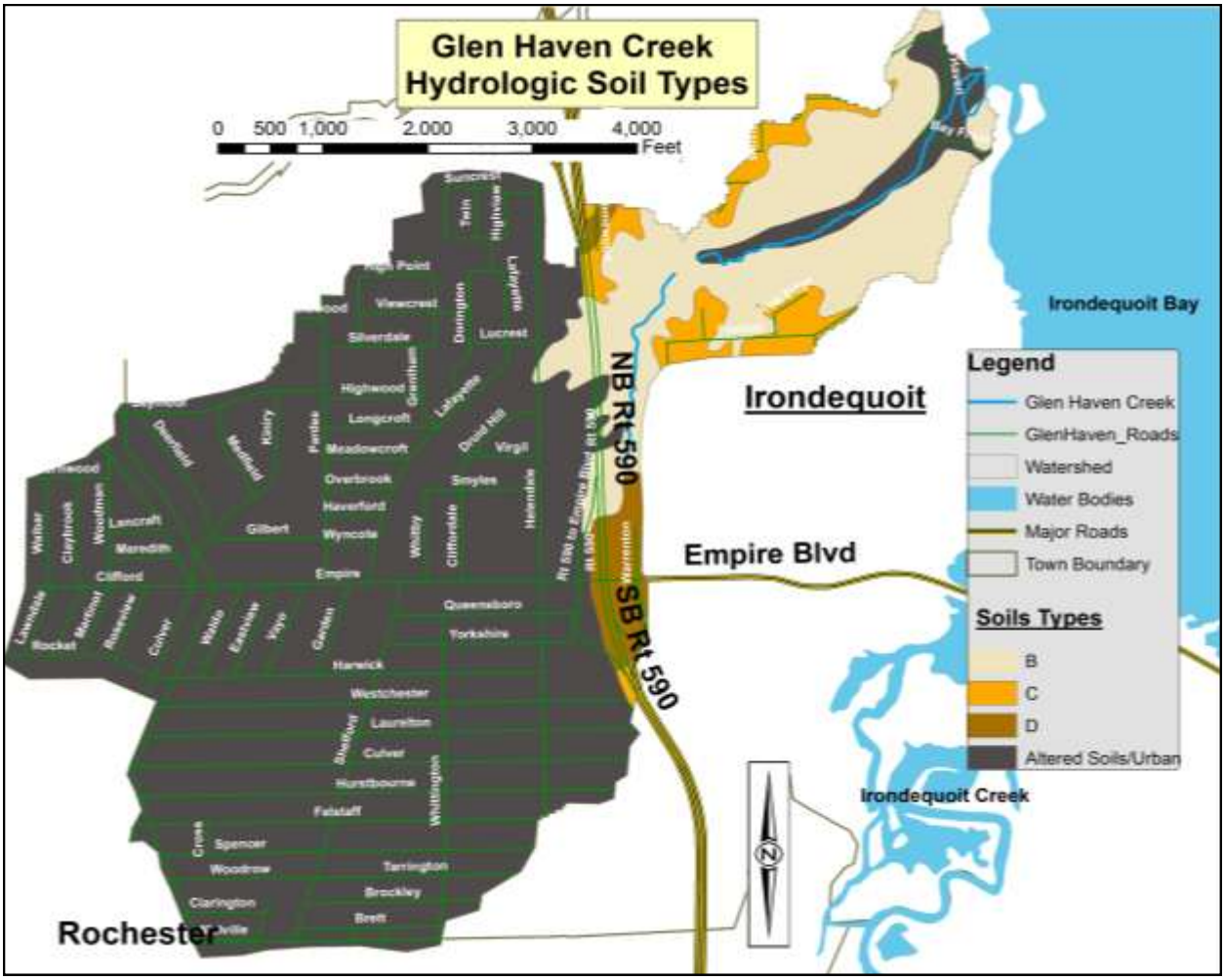

Figure 6. Hydric Soils Map of Glen Haven Creek Watershed

Section 2. Retrofit Inventory

An inventory of potential retrofit sites was generated using GIS mapping tools to locate public properties, stormwater practices like 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 those were ranked based on their feasibility, how much they would improve water quality and, be cost-effective. While the stormwater management practice types focused on green infrastructure (stormwater volume-reducing practices such as infiltration) retrofitting stormwater ponds is a highly cost-effective practice and these projects rank well and are recommended. 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 new 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,
    - Older Residential Neighborhoods, and
    - Other Locations (such as areas with large impervious surfaces i.e. shopping malls)

Since the primary land use is residential in Glen Haven Creek watershed and 99 percent of homes predate any stormwater management requirements, every neighborhood could be retrofitted with GI to help restore the hydrology and water quality of Glen Haven Creek. However, another criteria adopted is a 10,000 square foot minimum lot size. Smaller lots are considered unable to accommodate GI practices. Only 20 percent of the 2900 residential lots met this criteria or six subdivisions chosen for GI retrofits.

Because so much of this urban stream has been piped, the first stream daylighting project in Monroe County has been proposed here and added to the retrofit list. The project could have considerable community, education and habitat value. There is also a good opportunity to add stormwater storage at two sites above the stream's crossing at Helendale Road and NYS Route 590. Both of these potential retrofits are shown in the retrofit diagrams. A group of pond retrofits and new ponds are shown around the NYS Route 590 interchange with Empire Boulevard. The large, relatively level surfaces are ideal potential retrofit sites.

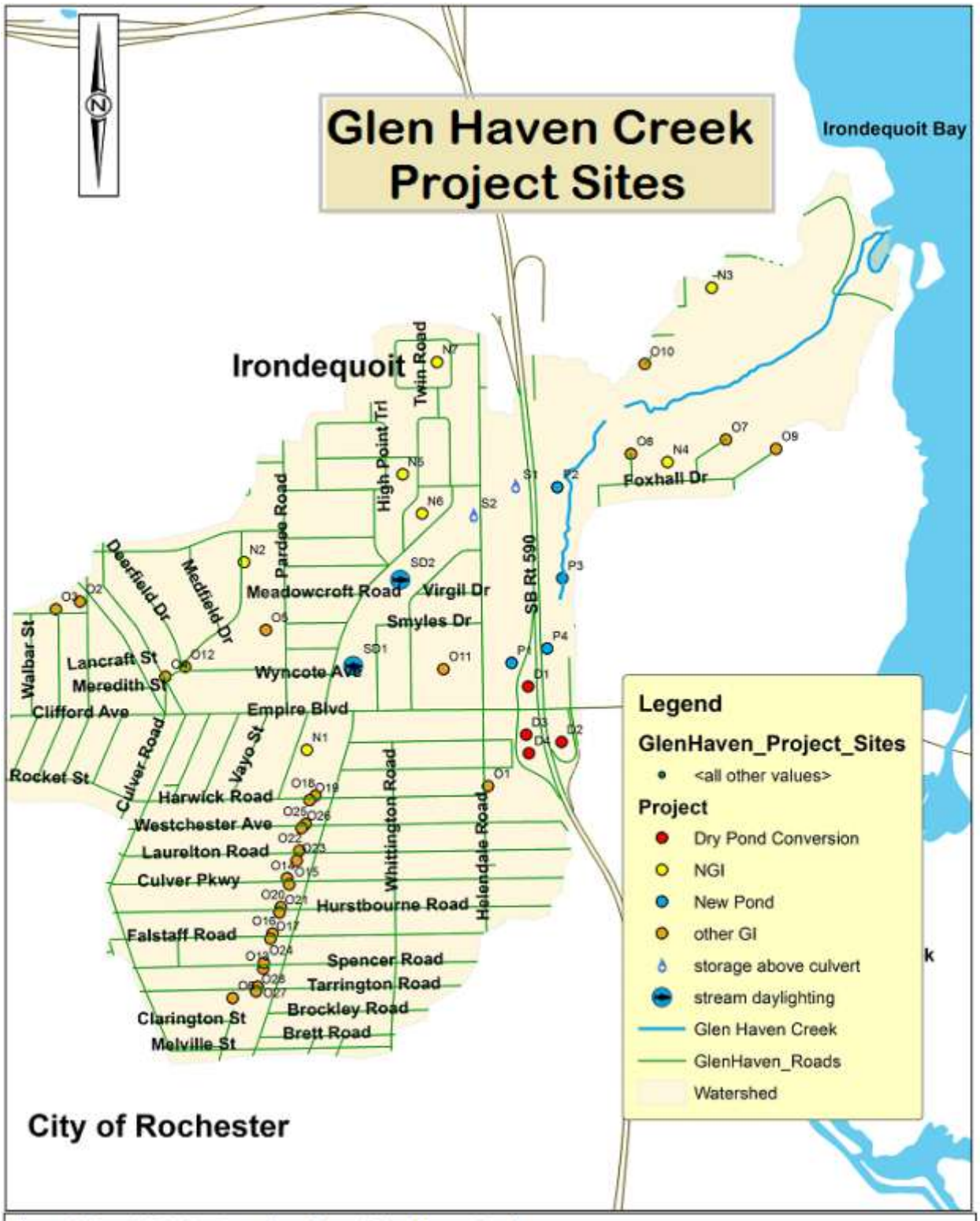

Figure 6. Retrofit Project Locations Map of Glen Haven Creek

Figure 6 shows project locations and project number within the watershed. Table 2 lists project addresses and how they scored. Diagrams of the top scoring projects follow the table.

In addition, Figure 6 shows another group of retrofits along the Rochester Gas and Electric easement/greenway south of Empire Boulevard. Retrofit opportunities include capturing road runoff in landscaped bioretention basins before allowing it to enter storm sewers where the seven residential roads cross the 45 foot wide easement with overhead utility poles (Figure 7).

One ranking criteria awards points for soils with good infiltration capabilities. Projects in the upper watershed scored fewer points since soils there are mapped under the generic hydrologic group "Altered/Urban" or basically, unknown.

Figure 7. Bioretention could be installed in the road right-of-way adjacent to RG&E's 45 foot wide easement (note the red gate access)

Table 2 Glen Haven Creek Retrofit Ranking List

Project Type/Map ID	Project Location	Fea-sability	Environ-mental Benefits	Cost Effec-tivness	Score	Over-all Rank
New Pond/P2	C/O monroe capture SW (E. side 590 N. of Empire)	5	I, FS, WQ, CP	3	13	1
New Pond/P3	C/O monroe capture SW (E. side 590 N. of Empire)	5	I, FS, WQ, CP	3	13	1
New Pond/P4	pick up storm sewer to 590 from Warrenton St	5	I, FS, WQ, CP	3	13	1
dry basin conversion/D1	590 at empire off ramp south bound (west side)	5	FS,WQ,Cp,	3	11	2
dry basin conversion/D2	590 at empire on ramp cloverleaf (east side)	5	FS,WQ,Cp,	3	11	2
dry basin conversion/D3	590 at empire on ramp south bound (west side)	5	FS,WQ,Cp,	3	11	2
dry basin conversion/D4	590 at empire on ramp south bound (west side)	5	FS,WQ,Cp,	3	11	2
New Pond/P1	590 at Empire south bound west side of off ramp	5	FS, WQ, CP	3	11	2
New Pond/P7	590 North bound at Empire Blvd exit	5	FS,WQ,Cp,	3	11	2
other GI/O6	bioretention 143 Woodrow Ave vacant Irondequoit Sewer dist lot	5	WQ. SC	3	10	3
Neighborhood G1/N1	Clifford Garden, around Garden Dr	2	CR, WQ, E, SC	3	9	4
Neighborhood G1/N2	Fairview around Kiniry dr	2	CR, WQ, E, SC	3	9	4
Neighborhood G1/N3	Glenview ht, around Glenview ln	2	CR, WQ, E, SC	3	9	4
Neighborhood G1/N4	Orchard pk. around Foxhall Dr Rick Edge cir	2	CR, WQ, E, SC	3	9	4
Neighborhood G1/N5	Silverdale around Silverdale and Lucrest dr	2	CR, WQ, E, SC	3	9	4
Neighborhood G1/N6	Suncrest 2 around Layfayette Rd	2	CR, WQ, E, SC	3	9	4
Neighborhood G1/N7	Suncrest ht. around highview dr, Suncrest dr	2	CR, WQ, E, SC	3	9	4
GI on Public Highway/O7	c-d-s- biorentention Rick Edge Cir	4	WQ,SC		9	4
GI on Public Highway/O8	c-d-s biorention Dean View	4	WQ,SC	3	9	4
GI on Public Highway/O9	c-d-s bioretention Fox Hall Dr	4	WQ,SC	3	9	4

Glen Haven Creek Retrofit Ranking List (continued)

Project Type/ Map ID	Project Location	Feasability	Environmental Benefits	Cost Effectivness	Score	Overall Rank
GI on Public High-	c-d-s bioretention Shingle Mill rd	4	WQ,SC	3	9	4
GI on Public High-	large pved intersec deerfield kinity and gil-	4	WQ, SC	3	9	4
New Pond/P5	throttle flow in deep ravine above west side	4	FS, CP	3	9	4
New Pond/P6	throttle flow in deep ravine above west side culvert at Helendale	4	FS, CP	3	9	4
other GI/O1	220 Helendale Road Primary School	4	WQ,SC, E	1	8	5
other GI/O4	bioretention on vacant 0.3 ac RPWD parcel 75 Deerfield Dr	5	WQ,SC	1	8	5
other GI/O5	bioretention 113 Pardee Rd playground 1/2 ac park	5	WQ, SC	1	8	5
GI on Public High-way/O13	pick up roadside RG&E ROW+Spencer Rd S. side	3	WQ, SC	3	8	5
GI on Public High-way/O14	picks up roadside runoff RG&E ROW+ culver pkwy N	3	WQ, SC	3	8	5
GI on Public High-way/O15	picks up roadside runoff RG&E ROW+ culver pkwy S	3	WQ, SC	3	8	5
GI on Public High-way/O16	picks up roadside runoff RG&E ROW+ Fal-staff N Side	3	WQ, SC	3	8	5
GI on Public High-way/O17	picks up roadside runoff RG&E ROW+ Fal-staff S Side	3	WQ, SC	3	8	5
GI on Public High-way/O18	picks up roadside runoff RG&E ROW+ Har-wick N	3	WQ, SC	3	8	5
GI on Public High-way/O19	picks up roadside runoff RG&E ROW+ Har-wick S	3	WQ, SC	3	8	5
GI on Public High-way/O20	picks up roadside runoff RG&E ROW+ hurst-bourne N	3	WQ, SC	3	8	5
GI on Public High-way/O21	picks up roadside runoff RG&E ROW+ hurst-bourne S	3	WQ, SC	3	8	5
GI on Public High-way/O22	picks up roadside runoff RG&E ROW+ Laurel-ton N	3	WQ, SC	3	8	5
GI on Public High-way/O23	picks up roadside runoff RG&E ROW+ Laurel-ton S	3	WQ, SC	3	8	5
GI on Public High-way/O24	picks up roadside runoff RG&E ROW+ Spen-cer N Side	3	WQ, SC	3	8	5
GI on Public High-way/O25	picks up roadside runoff RG&E ROW+ Westchester N	3	WQ, SC	3	8	5
GI on Public High-way/O26	picks up roadside runoff RG&E ROW+ Westchester S	3	WQ, SC	3	8	5
GI on Public High-way/O27	picks up roadside runoff RG&E ROW+ Wood-row N side	3	WQ, SC	3	8	5
GI on Public High-way/O28	picks up roadside runoff RG&E ROW+ Wood-row S side	3	WQ, SC	3	8	5

Glen Haven Creek Retrofit Ranking List (continued)						
Project Type/ Map ID	**Project Location**	**Feasabil-ity**	**Environmental Benefits**	**Cost Effec-tivness**	**Score**	**Over-all Rank**
other GI/011	impervious cover reduction at 380 Empire Blvd	3	WQ,SC	2	7	6
other GI/02	bioretention Fernwood Park Apt. 65 waring rd ex. greenspace along Woodman Park	3	WQ, SC	1	6	7
other GI/03	bioretention Fernwood Park Apt. 65 waring rd ex. greenspace along Fernwood ROW	3	WQ, SC	1	6	7
stream daylighting/	1650 lf b/w druid hill park and Lafayette	4	FS,CR, E,	NA	6	7
stream daylighting/	400 lf N of Empire Blvd along trolley ROW	4	FS,CR, E,	NA	6	7


NYS Route 590
DRY BASIN CONVERSIONS
D2, D3, and D4
Empire Blvd
Queensboro Rd
Queensboro Rd
D2
D3
D4
LEGEND
Project Site
Creek


Fairview Subdivision
Neighborhood Green
Infrastructure (N2)
LEGEND
Parcel
Boundary
N
Highwood Road
Longcroft Road
Overbrook Ave
Pardee Road
Kinley Dr
Medfield Dr
Gilbert Dr
Seymour Road
Deerfield Dr
Culver Road
Lancraft St
Meredith St
Woodman Park


OTHER GREEN INFRASTRUCTURE
PRACTICE RETROFIT
biorentention at school - O1
LEGEND
A1
Project site
123
Contour interval
Yorkshire Rd
Helendale Rd
Helendale Rd
Helendale Rd
Helendale Road
Primary School
Westchester Ave
Laurelton Rd
A


Rt 590
LEGEND
Project site
A1
Contour interval
123
S1
S2
SD1
STREAM DAYLIGHTING
SD1, and
STORAGE ABOVE
CULVERT S1 and S2
Helendale
Druid Hill
Lafayette
Lucrest
Dorington
370
360
350
380
390
400
N

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.

New York State Department of Environmental Conservation. 2004. *Ontario Basin Waterbody Inventory and Priority Waterbodies List, Revised 2007*

2013

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

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

APPENDIX A

Rapid Assessment Compiled Data

Data and Files Developed

Glen Haven Creek Rapid Assessment Data

files are located in parent directory: **H:IW\Stormwater\Asmnt\Glen Haven Ck minor trib to IB** (unless otherwise noted)

Folder	Description	File Name	Data Origin
GIS Data			
-	Parcel data clipped to the extent of the watershed boundary	GlenHaven_Parcels.shp	Monroe County
	Diplays soil types and the drainage characteristics of the soils. An "A" soil has the highest drainage rate and "D" soils the lowest.	GlenHaven_Soils.shp	Monroe County
	Points show the location of all the new pond, pond retrofit, impervious cover, and storage projects.	GlenHaven_Project_Sites.shp	Monroe County
	Shapefile of the Glen Haven watershed from the USGS StreamStats website. The boundary was reshaped to reflect the influence of stormwater and combined sewer system.	GlenHaven_WS_CORR.shp	Originally from USGS StreamStats and then edited.
Photos	shapefile of over 100 photos of Glen Haven watershed in subfolder "photos" in parent directory	Glen_photos.shp	Field derived
	points show the location of field survey of outfalls from Monroe County DES years 2005-present	GlenHaven_outfalls	Field derived
	potential stream project locations for dechannelization and stabilization	Glen_StreamProjects.shp	Aerial and field derived
	Stormsewers	stormsewer.shp	Monroe County
Maps			
	watershed map and land use based on Real Property class codes	GlenHaven_LULC.pdf	Monroe County
	map displays all of the hot spot locations throughout the watershed.	GlenHavenCreek_HS.pdf	Monroe County
	displays all outall locations mapped and rated by possibility of illicit discharge.	GlenHaven_outfalls.pdf	Monroe County
	This map displays the hydrolic soils (A, B, C, D) throughout the watershed.	GlenHaven_soils.pdf	Monroe County
	This map displays the locations of various stream projects throughout the watershed.	stream projects.jpg	Monroe County
	This map displays the locations of the potential projects sites throughout the watershed.	projects map.jpg	Monroe County

Glen Haven Creek Rapid Assessment Deliverables (continued)

files are located in parent directory: **H:IW\Stormwater\Asmnt\Glen Haven Ck minor trib to IB** (unless otherwise noted)

ID or Folder	Description	File Name	Data Origin
Diagrams			
O24	jpg shows site aerial photo with general location of GI practice	192 spencer rd potential gi.jpg	Monroe County
D1-D4	jpg shows site aerial photo with general location of GI practice	590 dry basin conversions.jpg	Monroe County
N2	jpg shows site aerial photo with general location of GI practice	FairviewNGI.jpg	Monroe County
O1	jpg shows site aerial photo with general location of GI practice	helendale primary school biore-tention.jpg	Monroe County
O22	jpg shows site aerial photo with general location of GI practice	laurelton st no gutters.jpg	Monroe County
SD1 & S2	jpg shows site aerial photo with general location of GI practice	stream daylite and culvert deten-tion.jpg	Monroe County

APPENDIX B

NYSDEC PWL Data

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 **Resolution Potential:** Medium
TMDL/303d Status: 3b*

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.

Part 3b - Waterbodies for which TMDL Development May be Deferred (Requiring Verification of Cause/Pollutant) (con't)

Water Index Number	Waterbody Name (WI/PWL ID)	County	Type	Class	Cause/Pollutant	Source	Year
	Lake Ontario (Minor Tribs) Drainage Basin (con't)						
Ont 108/P113- 1 thru 6 (selected)	Minor Tribs to Irondequoit Bay (0302-0038) [72]	Monroe	River	C	Oxygen Demand [1]	Municipal, Urban Runoff	2008
Ont 108/P113- 1 thru 6 (selected)	Minor Tribs to Irondequoit Bay (0302-0038) [72]	Monroe	River	C	Phosphorus	Municipal, Urban Runoff	2008
Ont 108/P113- 1 thru 6 (selected)	Minor Tribs to Irondequoit Bay (0302-0038) [72]	Monroe	River	C	Pathogens	Municipal, Urban Runoff	2008
Ont 108/P113- 3-12	Thomas Creek/White Brook and tribs (0302-0023)	Monroe	River	B	Phosphorus	Municipal, Urban Runoff	2008
Ont 120	Slater Creek and tribs (0301-0020)	Monroe	River	C	Oxygen Demand [1]	Onsite WTS	2004
Ont 144	Golden Hill Creek and tribs (0301-0050)	Niagara	River	C	Aquatic Toxicity	Unknown	2008
Ont 148	Eighteenmile Creek, Upp, and minor tribs (0301-0055)	Niagara	River	D	Aquatic Toxicity	Unknown	2008
Ont 149	Hopkins Creek and tribs (0301-0060)	Niagara	River	C	Aquatic Toxicity	Unknown	2008
Ont 156	Fourmile Creek, Lower, and tribs (0301-0066)	Niagara	River	B	Aquatic Toxicity	Unknown	2008
	Genesee River Drainage Basin						
Ont 117- 14	Red Creek and Tribs (0402-0024)	Monroe	River	C	Aquatic Toxicity	Urban Runoff	2010
Ont 117- 18	Little Black Creek, Lower, and tribs (0402-0047)	Monroe	River	C	Aquatic Toxicity	Urban Runoff	2004
Ont 117- 19-28	Spring Creek and tribs (0402-0036)	Genesee	River	C	Aquatic Toxicity	Urban Runoff	2010
Ont 117- 19-30	Bigelow Creek and tribs (0402-0016)	Genesee	River	C	Phosphorus	Agriculture	2004
Ont 117- 27-13	Unnamed Trib to Honeoye Cr, and tribs (0402-0081)	Monroe	River	C	Nutrients	Agriculture	2010
Ont 117- 57	Jaycox Creek and tribs (0402-0064)	Livingston	River	C	Phosphorus	Agriculture	2004
Ont 117- 57	Jaycox Creek and tribs (0402-0064)	Livingston	River	C	Silt/Sediment	Agriculture	2004
Ont 117- 66-22	Mill Creek and minor tribs (0404-0011)	Livingston	River	C(TS)	Silt/Sediment	Streambank Erosion	2004
Ont 117- 70	Silver Lake Outlet, Upper, and tribs (0403-0034)	Wyoming	River	C	Unknown	Unknown	2004
	Chemung River Drainage Basin						
Pa 3-57- 5 (portion 4)	Canisteo River, Middle, and minor tribs (0503-0001)	Steuben	River	C	Aquatic Toxicity	Unknown	2008
	Susquehanna River Drainage Basin						
SR- 31 thru 37 (selected)	Minor Tribs to Lower Susquehanna (0603-0044) [73]	Broome	River	C	Phosphorus	Agric, Urban Runoff	2010
	Oswego River (Finger Lakes) Drainage Basin						
Ont 66- 4	Waterhouse Creek and tribs (0701-0026)	Oswego	River	C	Aquatic Toxicity	Urban Runoff	2012
Ont 66-12 (portion 1)	* Seneca River, Lower, Main Stem (0701-0001)	Onondaga	River	C	Oxygen Demand [1]	Invasive Species, Agric	1998
Ont 66-12 (portion 2)	Seneca River, Lower, Main Stem (0701-0008)	Onondaga	River	C	Oxygen Demand [1]	Invasive Species, Agric	1998
Ont 66-12-12-P154- 2	Bloody Brook and tribs (0702-0006)	Onondaga	River	C	Aquatic Toxicity	Unknown	2010
Ont 66-12-51	Crane Brook and tribs (0704-0024)	Cayuga	River	C	Salinity	Unknown	2008

[72] The specifically identified impaired water(s) in this segment include Densmore Creek (-5).

[73] The specifically identified impaired water(s) in this segment include Patterson Creek (-36).