

Madigan Creek Watershed Assessment

Introduction

Material presented in the following summary documents current stormwater management and flooding issues for the Madigan Creek Watershed. Information presented is based on a review of available information related to current conditions in the drainage basin. No comprehensive analysis of stormwater management and flooding issues in the watershed has been performed in the last 20 years.

Watershed Description

Description and Land Use

The Madigan Creek watershed is located in the eastern part of the City of Rockford and drains ultimately into the Kishwaukee River. The watershed drains approximately 4,115 acres at its mouth. Roughly 50% of the watershed is located within the City of Rockford. The remaining 50% of the watershed extends into the Village of Cherry Valley and unincorporated Winnebago County.

Watershed Statistics: Madigan Creek	
Total Area:	4,115 ac.
Total Area within City:	2,045 ac.
% of City within Watershed:	5.2%
Other Stakeholders:	Cherry Valley
No. of Detention Facilities	50
No. of Outfalls	4

The Madigan Creek watershed is about 60% developed. The majority of the current development has occurred in the north and central portions of the watershed. Though predominantly residential, the Madigan Creek watershed also contains commercial/retail developments and agricultural land, as well as Mulford Quarry and Cherryvale Mall in the south. There is heaviest commercial development in the north along the State Street corridor within the City of Rockford. The City anticipates that development will extend to less developed areas within the coming years, as the City annexes additional land in the watershed.

Topography and Soils

The topography of the Madigan Creek watershed is slightly different from the other watersheds east of the Rock River in that it's drainage is obviously reversed. Ground elevations within the watershed range from about 850 feet NAVD near north of State Street, to about 750 feet NAVD near the creek's confluence with the Kishwaukee River.

Soils within the Madigan Creek watershed consist completely of type B soils, with thin pockets of type D soils surrounding the creek bed. Type B soils are soils with moderately low runoff potential when thoroughly wet. Water can be transmitted through these soils without impediment. Type B soils typically have less than 20 percent clay, and between 50 and 90 percent sand with a loamy sand or sandy loam textures. These soils have moderately fine to moderately coarse textures. Type D soils are characterized by properties that restrict water movement through the soil. Type D soils typically have greater than 40 percent clay, less than 50 percent sand, and have clayey textures. They have high runoff potential when thoroughly wet.¹⁵ The predominance of type B soils in the Madigan Creek watershed should facilitate infiltration of rainfall in pervious areas, thereby contributing to lower runoff volumes and rates than in basins with less pervious soil types.

Primary Receiving Stream

Madigan Creek is the primary receiving stream for the Madigan Creek watershed. The creek is approximately 9,100 feet (1.7 mi.) long and exists in essentially a natural state. Madigan Creek has a stream bed elevation of 711 feet (NAVD) at its mouth, and 773 feet (NAVD) at its origin. The creek is relatively steep, with an average fall of 36.5 feet per mile. The profile of the stream is shown in the Flood Profile extracted from the 2006 Flood Insurance Study for Winnebago County and Incorporated Areas.

There are no significant impoundments on Madigan Creek.

There are no USGS Gauging stations in Madigan Creek.

Readily available flow data for the Madigan Creek watershed is presently limited to calculated flood flows published in the Flood Insurance Study for Winnebago County and Incorporated Areas are summarized in Table MC-1 below. It is important to note that these flows are based on analyses performed more than 30 years ago and likely do not reflect current conditions in the watershed.

¹⁵ Burke, Christopher and Thomas Burke. HERPICC Stormwater Drainage Manual. West Lafayette, Indiana: Purdue Research Foundation, 1994.

Table MC-1
FLOOD INSURANCE STUDY FLOWS (1976)
MADIGAN CREEK WATERSHED, ROCKFORD, ILLINOIS

Cross Section Location	50-year Flow		100-year Flow	
	Flow (cfs)	Flow (cfs/acre)	Flow (cfs)	Flow (cfs/acre)
At Charles Street	920	0.369	1139	0.456

Source: Flood Insurance Study, Winnebago County and Incorporated Areas, Federal Emergency Management Agency. 2006. Flows based on 1976 analysis.

Given the character of the watershed, flooding within Madigan Creek is of a flashy nature, and over-bank flooding is mostly only found far downstream near the mouth of the creek. As shown in Figure MC-1, the floodplain along Madigan Creek is relatively narrow over most of the length of the stream. Areas where the mapped floodplain appears to include developed properties include:

- Newburg Rd. and Trainer Rd.
- Bell School Rd. and Waterford Dr.
- Harrison Ave. and Lundgren Rd.
- South and east of I-39

Records maintained by the Federal Emergency Management Agency (FEMA), indicate that no letters of map revision (LOMRs) have been issued for development projects in the Madigan Creek watershed during the past 30 years.

Water Quality and NPDES Discharges

Madigan Creek is a clear, spring-fed stream. The waters are generally cool and clear with thriving aquatic life. Sedimentation has occurred in certain portions of the creek, indicating that the stream is susceptible to impacts resulting from erosion of upstream agricultural lands.

SCORE has not sampled water quality in the Madigan Creek watershed. Table MC-2 provides the NPDES-permitted point sources in the watershed.

Table MC-2
NPDES POINT SOURCES WITHIN THE MADIGAN CREEK WATERSHED
ROCKFORD, ILLINOIS

NPDES Permit #	Facility Name	Receiving Water
ILG840122	Rockford Sand and Gravel	Not listed
ILR10H697	Harrison Park North Subd L4 P1	Not listed

Runoff from industrial sites is a potential pollutant source for receiving waters. Table MC-3 lists twelve industrial sites that are located in the Madigan Creek watershed.

Table MC-3
INDUSTRIAL SITES LOCATED WITHIN THE MADIGAN CREEK WATERSHED
ROCKFORD, ILLINOIS

Name	Street	Land Use Code (LUC)	LUC Description
Borders Group, Inc.	Deane Dr.	5000	Wholesalers & Retail Outlets
Heartland Community Church	Perryville Rd.	7000	Miscellaneous Services
Milburry Cadillac & Oldsmobile	Perryville Rd.	4100	Transportation Services
Humphry Cadillac	Perryville Rd.	4100	Transportation Services
Comfort Inn	Argus Dr.	7015	Hotel without Restaurant
Rubloff Development Group	State St.	5814	Full Service Restaurants
Radisson Hotel & Conference Center	Bell School Rd.	7011	Hotel with Restaurant
Sam's Wholesale #18-8297	Walton St.	5400	Full Service Grocery Store
Alma Nelson Nursing Home	Mulford Rd.	8061	Nursing Homes
Anderson Toyota	State St.	4100	Transportation Services
Buttita Brothers Automotive	Mill Rd.	4100	Transportation Services
Rosewood Care Center of Rockford	Mulford Rd.	8061	Nursing Homes

Existing Drainage Network

Drainage within the Madigan Creek watershed occurs through a mix of surface drainage paths, storm sewers, and creek channels. In the less developed northeastern part of the watershed,

surface drainage is the primary mode of stormwater conveyance. The southwestern and central portions of the Madigan Creek watershed are drained by extensive networks of storm sewers as shown in Figure MC-2.

Figure MC-2 also shows the general location of identified detention basins and storm sewer outfalls within the Madigan Creek watershed. The Madigan Creek watershed has 50 identified detention facilities. These facilities are distributed through the central and northern part of the watershed. They are all north of Newburg Rd. but mostly concentrated along State Street and the middle branch of Madigan Creek. The 6 identified storm sewer outfalls within the watershed are located all west of Perryville Rd.

Available Data Resources

Previous Drainage Studies

A review of available data identified no recent, comprehensive studies of drainage issues within the Madigan Creek watershed. Previous drainage studies that included consideration of the watershed are listed below:

“A Master Drainage Plan for the Rockford Regional Area: Rockford-Winnebago County Regional Drainage Plan and Study.” Espey, Huston & Associates, Inc. November 1981.

Historic Flow Data

No source of historic flow data has been identified for the Madigan Creek watershed.

Historic Water Quality Data

No source of historic water quality data has been identified for the Madigan Creek watershed. (pending input from David Pott)

Other

Floodplain and Floodway:

Flood Insurance Study: Winnebago County and Incorporated Areas, (FEMA, 2006)

Soil Characteristics:

“Soil Survey Geographic (SSURGO) database for Winnebago County, Illinois.”

Fort Worth: U.S. Department of Agriculture, Natural Resources Conservation Service, 2007.

URL:<<http://SoilDataMart.nrcs.usda.gov/>>

“Rockford and Cherry Valley Flood of 8/6/07 – 8/7/07 Surveillance Report.” Illinois Department of Natural Resources: Office of Water Resources, September 2007.

Drainage Issues

Table MC-1 (on the following page) provides a summary listing of current identified drainage issues and projects within the Madigan Creek watershed. The general locations of these issues and projects are shown on Figure MC-1.

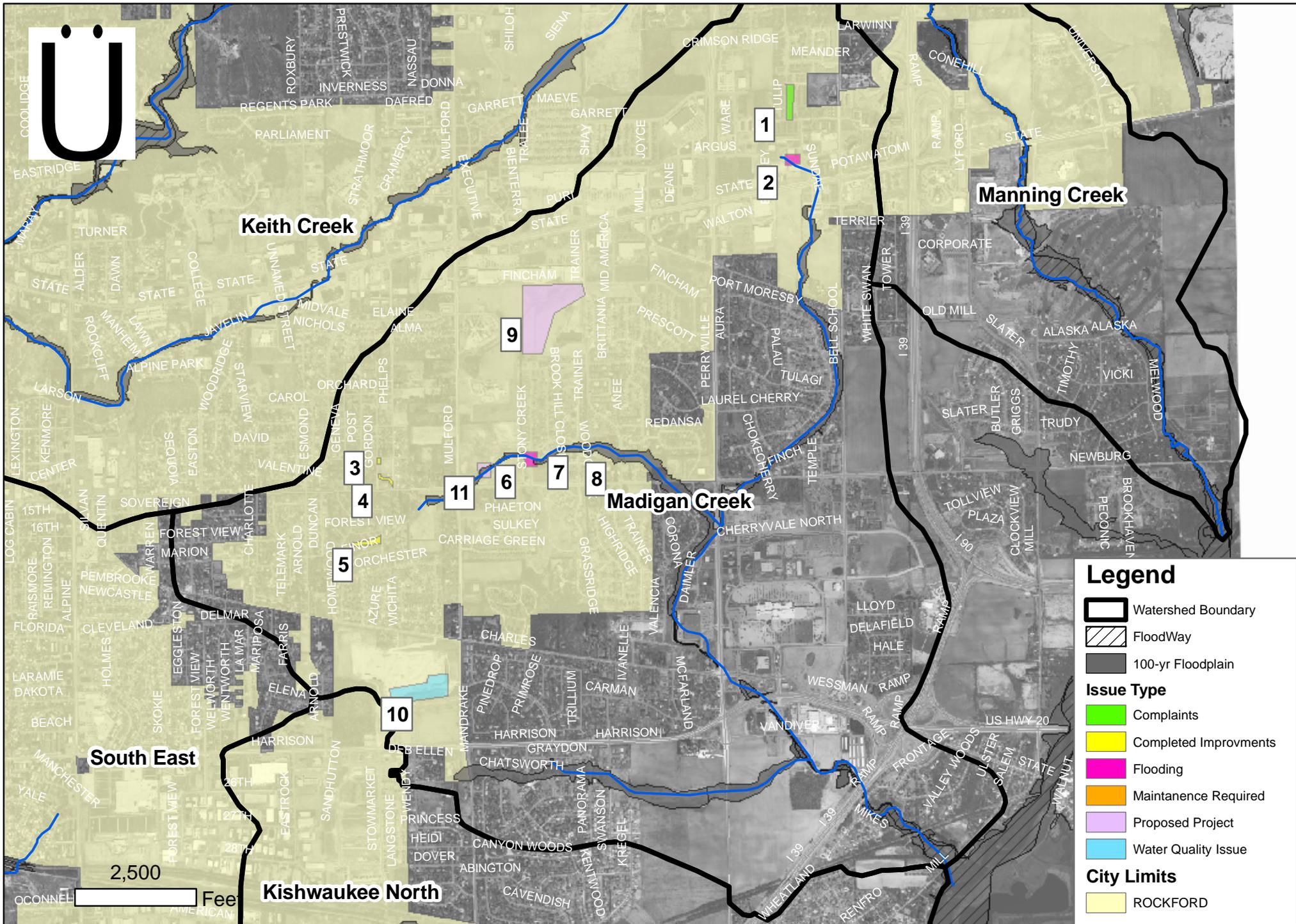
The Madigan Creek watershed experiences most flooding problems due to localized surface ponding and inadequacy of stormwater infrastructures. The watershed experiences sewer backups frequently, and there are undersized sewers and poorly maintained culverts that need to be addressed by the City. Upstream along the creek, there is little, to no, over-bank flooding. Flash flooding is a risk further downstream, near the confluence with the Kishwaukee River.

The Mulford Quarry in the southwestern corner of the watershed is in the process of being served a class-action lawsuit filed by the residents living immediately east of the Quarry. For the time being, the Quarry is offline. The lawsuit addresses concerns that the Quarry is pumping

The City needs to be aware of the rapid development of the watershed, and ensure stormwater and flood management structures are updated to keep pace with development. This includes holding new retail and commercial development to adhere to stormwater detention regulations.

**Table MC-1
SUMMARY OF STORMWATER/FLOOD CONTROL ISSUES AND PROJECTS
MADIGAN CREEK WATERSHED, ROCKFORD, ILLINOIS**

#	Brief Description of Issue	Issue Type				Action		
		Over-bank Flooding	Major Surface Flooding	Localized/Nuisance Flooding	Water Quality Impacts	Improvements Completed	Maintenance Required	Future Project
1	Tulip Lane - Area residents west of Tulip Lane report the occurrence of back yard flooding.			•				
2	Intersection at Argus and Sundae Drives - Area experiences street flooding with depths up to 4 feet during small frequency storms.			•				
3	SE of Woodbine Drive and Gordan Avenue - Maintenance performed.					•		
4	NE of Newburg Road and Gordan Avenue - Channel cleaning performed.					•		
5	NW of Greenleaf Way and Einor Avenue - Channel cleaning performed.					•		
6	Stoney Creek Way and Creek - Occurrence of nuisance flooding due to undersized culverts			•				
7	Wood Creek Bend and Creek - Area residents report of flooding along driveways to homes. Storm sewer will need to be upsized to keep runoff to the road.			•				
8	Trainer Road and Creek - The 78-inch culvert is in need of maintenance. Crossing does not have a headwall and side slopes are severely eroded. Slope stabilization will be required.						•	
9	Madigan Creek Regional Detention Facility - Future project to help alleviate flooding at State Street and Trainer Road and to provide additional detention storage for future developments along State Street between Mulford and Perryville Roads.		•					•
10	Quarry SW of Charles Street and Mulford Road - Current owner would like make the existing quarry deeper and increase the pumping rate to the downstream receiving channel. Potential water quality impacts.				•			•
11	NE of Brady Lane and Stone Bridge Crossing - Subdivision Owner would like to construct a bridge for an additional access road.							•

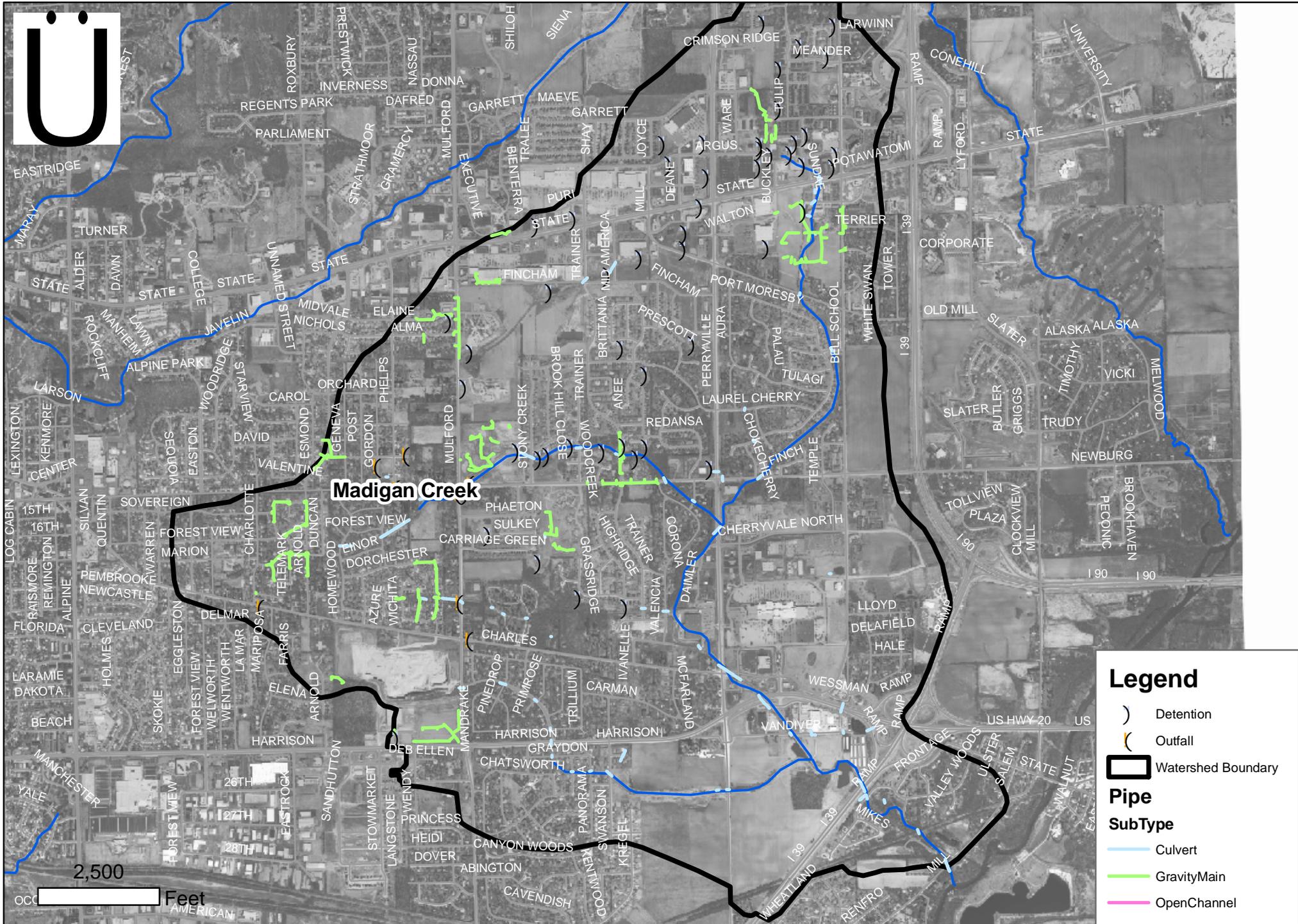
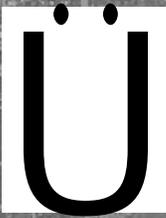


Madigan Creek Watershed Flooding Issues

City of Rockford, Illinois
Autumn 2008



Figure MC - 1



Legend

-) Detention
- ⤵ Outfall
- ▭ Watershed Boundary

Pipe SubType

- Culvert
- GravityMain
- OpenChannel

Madigan Creek Outfalls, Detention and Storm Sewer
 City of Rockford, Illinois
 Current Data as of Autumn 2008



Figure MC - 2