Discovery Report

Upper Sangamon Watershed, 07130006

Champaign, Christian, DeWitt, Ford, Logan, Macon, McLean, Piatt, Sangamon, and Shelby Counties, Illinois

Report Number 01

11/14/2012

Updated 2/19/2015

FEMA

ILLINOIS STATE
WATER SURVEY
PRAIRIE RESEARCH INSTITUTE

Project Area Community List

Community Name	2010 Census Population*
Champaign County	**201,081**
Village of Fisher	1,881
Village of Foosland	101
Village of Mahomet	7,258
Village of Rantoul	12,941
Christian County	**34,800**
Village of Mount Auburn	480
Village of Stonington	932
DeWitt County	**16,561**
Village of Weldon	429
Ford County	**14,081**
City of Gibson City	3,407
Logan County	**30,305**
Macon County	**110,768**
Village of Argenta	947
Village of Blue Mound	1,158
City of Decatur	76,122
Village of Forsyth	3,490
Village of Harristown	1,367
Village of Long Creek	1,328
City of Macon	1,138
City of Maroa	1,801
Village of Mount Zion	5,833
Village of Niantic	707
Village of Oreana	875
Village of Warrensburg	1,210

Community Name	2010 Census Population*
McLean County	**169,572**
Village of Arrowsmith	294
Village of Bellflower	357
Village of Ellsworth	195
Village of Saybrook	693
Piatt County	**16,729**
Village of Cerro Gordo	261
Village of Cisco	446
Village of DeLand	1,403
Village of Mansfield	906
City of Monticello	5,548
Sangamon County	**197,465**
Village of Buffalo	503
Village of Dawson	509
Village of Illiopolis	891
Village of Mechanicsburg	590
Shelby County	**22,363**

* total population within the political boundary, not limited to the HUC8

Table of Contents

List of Figures

List of Tables

List of Appendices

I. General Information

The Sangamon River flows from east to west through central Illinois and is tributary to the Illinois River. The Sangamon River basin drains 5,419 square miles and forms the largest watershed of any of the tributaries to the Illinois River. The Sangamon Basin is composed of four HUC8 subbasins: Upper Sangamon, Salt Creek, South Fork Sangamon, and Lower Sangamon. This area is primarily characterized by agricultural land usage. (IDNR, 1999)

This Discovery project covers the Upper Sangamon subbasin, HUC 07130006, which has a drainage area that encompasses approximately 1,150 square miles (781,140 acres) and includes the main stem of the Sangamon River from about the Village of Ellsworth in McLean County to slightly beyond the Village of Dawson in Sangamon County. The watershed includes significant portions of Piatt and Macon counties, the northwestern portion of Champaign County, and smaller parts of Christian, DeWitt, Ford, Logan, McLean, Sangamon, and Shelby counties. (IDNR, 1999)

Figure 1. Upper Sangamon HUC 07130006

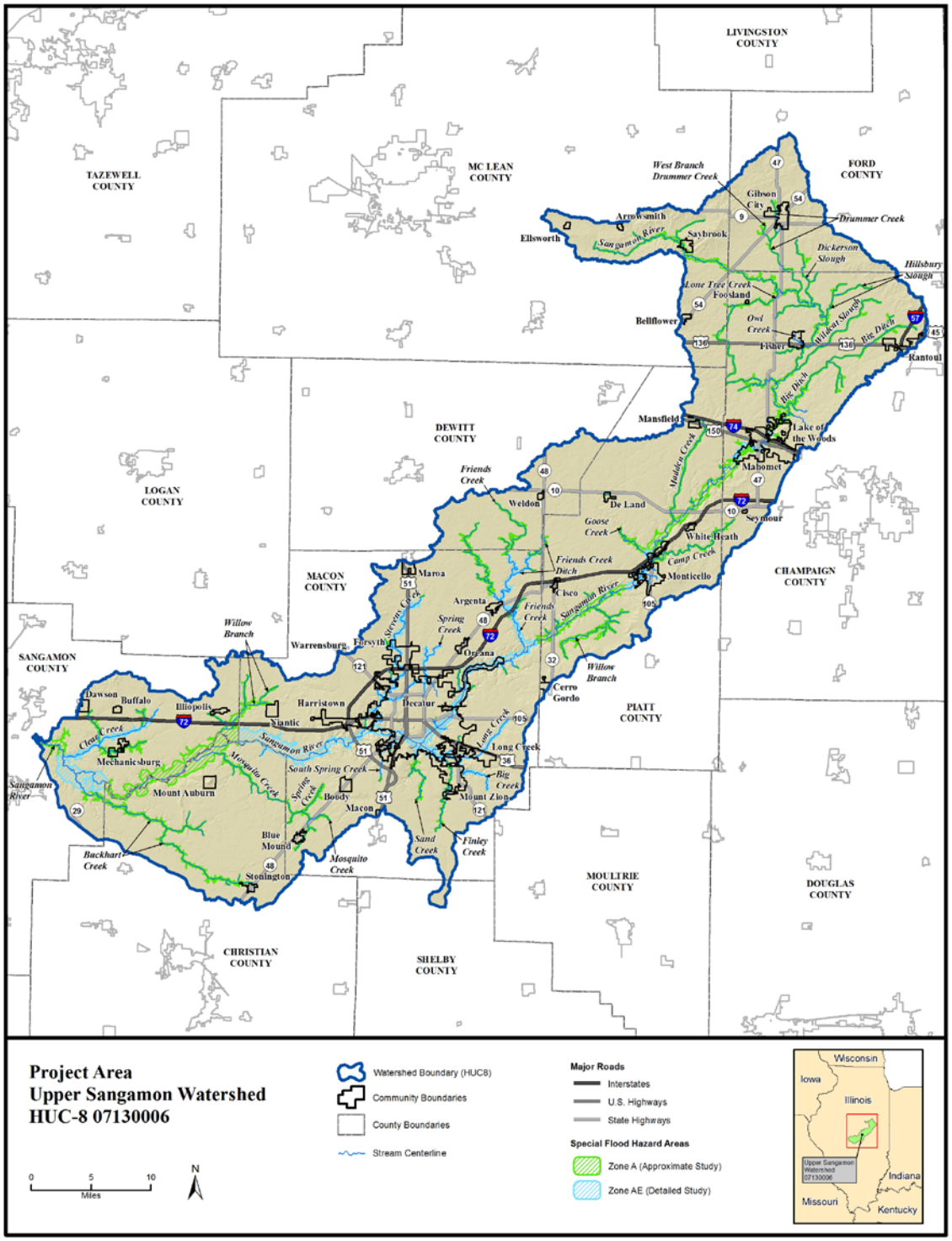


Table 1. NFIP Participation Status

County	Community	Participating
Champaign	Champaign County	Yes
	Fisher	Yes
	Foosland	Yes
	Mahomet	Yes
	Rantoul	Yes
Christian	Christian County	Yes
	Mount Auburn	No
	Stonington	Yes
DeWitt	DeWitt County	Yes
	Weldon	Yes
Ford	Ford County	No
	Gibson City	No
Logan	Logan County	Yes
Macon	Macon County	Yes
	Argenta	Yes
	Blue Mound	Yes
	Decatur	Yes
	Forsyth	Yes
	Harristown	No
	Long Creek	Suspended
	Macon	No
	Maroa	No
	Mount Zion	Yes
	Niantic	No
	Oreana	No
	Warrensburg	No
McLean	McLean County	Yes
	Arrowsmith	No
	Bellflower	No
	Ellsworth	No
	Saybrook	Yes
Piatt	Piatt County	Yes
	Cerro Gordo	No
	Cisco	Yes
	Deland	Yes
	Mansfield	Yes
	Monticello	Yes
Sangamon	Sangamon County	Yes
	Buffalo	No
	Dawson	No
	Illiopolis	Yes
	Mechanicsburg	No
Shelby	Shelby County	No

(CIS, 11/26/2014)

II. Watershed Stakeholder Coordination

Discovery

The Discovery phase included an investigation of existing terrain, flood hazard data, and flood risk data; broad data mining for development of an initial Discovery map; and detailed data collection to refine the Discovery map, which was prepared by the Illinois State Water Survey (ISWS). Watershed coordination meetings were held with community, state, and federal officials to share information concerning the watershed and its stakeholders.

Approximately six weeks prior to the Discovery Meeting, the Federal Emergency Management Agency (FEMA) Region V conducted a project team conference call with ISWS and appropriate state and federal officials. Two pre-Discovery meetings were held with key community watershed officials. During the conference call and the pre-Discovery meetings, ISWS staff provided an overview of the Risk MAP program and the Discovery process. Information concerning the Sangamon River and its tributaries as well as current watershed projects and mitigation efforts was exchanged between ISWS staff and officials. Pre-Discovery materials are available in Appendix A.

Following this initial contact, ISWS staff updated a contacts database using available websites and made phone calls to the communities. These calls included an overview of the Risk MAP program and Discovery process. An invitation list for the Discovery meeting was compiled from the information gathered during the phone conversations. Approximately four weeks prior to the meetings, ISWS mailed letters to all invited stakeholders providing a background of the Risk MAP program and an invitation to attend a Discovery meeting. The contact information and invitations are available in Appendix B.

The Discovery meetings were hosted by the University of Illinois Extension Office, working in cooperation with ISWS. The meetings were held at the following places, dates, and times.

Macon County Extension Office
3351 N. President Howard Brown Blvd., Decatur, IL 62521
Monday, March 28, 2011, 1:30 PM – 3:30 PM

Piatt County Extension Office
210 South Market Street, Monticello, IL 61856
Tuesday, March 29, 2011, 10:00 AM – 12:00 PM

Each Discovery meeting was approximately two hours in length and consisted of introductory presentations followed by a break-out session in which stakeholders could review the Discovery map, ask questions, and provide comments and revisions.

Presentations were given describing Risk MAP program goals and objectives, hazard mitigation projects, FEMA's Community Rating System (CRS), and the Discovery meeting goals and objectives. The meeting materials are available in Appendix C.

For the break-out session, Discovery maps were available for review at approximately six to eight stations, and each station was staffed by ISWS personnel. After reviewing the maps and clarifying any questions, stakeholders completed comment forms that included their contact information and recommended revisions or general feedback. The meeting summary, attendance, and comments are available in Appendix D. The Discovery Maps are available in Appendix E.

Meeting participants received an evaluation questionnaire seeking their feedback on the Flood Risk Mapping Discovery meetings. The survey results and summary report are available in Appendix F.

Action Discovery

The Action Discovery phase provided a continuation of past Discovery efforts that focused upon more intensive coordination with communities possessing a higher mitigation action potential. The Upper Sangamon Action Discovery Project emphasized reducing flood risk through mitigation actions that would ultimately result in safer communities. Prior to the start of the project the Illinois State Water Survey (ISWS) conducted a project team conference call with FEMA and appropriate state and federal officials to gather relevant information concerning the watershed communities.

Upper Sangamon Action Discovery Tier 1 and Tier 2 communities were selected based upon the FEMA Community Action Potential Index (CAPI) scores, comment data collected during the Discovery phase, a draft AoMI dataset, Countywide Hazard Mitigation Plans, and input from FEMA and Illinois state agencies. Once the Tier 1 and Tier 2 watershed communities were designated contact information was updated and approximately four weeks prior to the Action Discovery meeting, ISWS sent invitations to selected communities. Prior to the Action Discovery meeting outreach began with a one-on-one phone call with the Tier 1 communities during which time unique local flood-related issues, plans, existing resources and tools, and mitigation priorities were discussed. The CAPI tier rankings, contact information and invitations are available in Appendix H.

The Upper Sangamon Action Discovery meeting was held at the following place, date, and time.

Tuesday, August 12, 2014, 1:30 – 3:30 PM
Macon County Office Building
County Board Room, Suite 501
141 South Main Street
Decatur, IL 62523

The Action Discovery meeting was approximately two hours in length and consisted of introductory presentations followed by a break-out session in which stakeholders reviewed and Discovery comments and Action Discovery maps, and provided information for needed community mitigation action projects.

Presentations were given describing FEMA's Risk MAP program goals, Community Rating System (CRS), Mitigation Action Tracker and mitigation ideas for local flood risk issues, and the Action Discovery meeting goals and objectives. The meeting materials and presentations are available in Appendix I.

For the break-out session, Action Discovery maps labeled with Discovery comment numbers were available for review at approximately six stations, and each station was staffed by ISWS personnel. After reviewing the maps and clarifying any questions, stakeholders updated Discovery meeting comments and completed Mitigation Action Forms that included their contact information and recommended mitigation projects for local flood risk areas. The mitigation projects were entered into FEMA's Mitigation Action Tracker. The meeting summary, attendance, updated comments, and Mitigation Action Forms are available in Appendix J. The Action Discovery maps are available in Appendix K.

III. Data

A list of the data collected, the deliverable or product in which the data are included, the source of the data, and any pertinent comments are provided in Table 2. Table 2 data can be used for flood risk products and additional information to benefit the project.

Table 2. Data Collection for Upper Sangamon Watershed

Data Types	Description	Source	Deliverable
Coordinated Needs Management Strategy (CNMS) Streams	Engineering study needs as defined by Phase 3 CNMS data	Region V Coordinated Needs Management Strategy Inventory	Discovery Map; Geodatabase
Community Boundaries	Location of community boundaries	U.S. Census 2010 Places TIGER file	Discovery Map; Geodatabase
Community Comments	Community comments collected during the discovery process	Discovery	Discovery Map; Geodatabase
Composite Risk Analysis	National Flood Risk Analysis HUC Risk Data	FEMA Region V	Discovery Map; Geodatabase
County Boundaries	Location of county boundaries	USGS Topographic Quad Maps	Discovery Map; Geodatabase

Table 3. Data Collection for Upper Sangamon Watershed (continued)

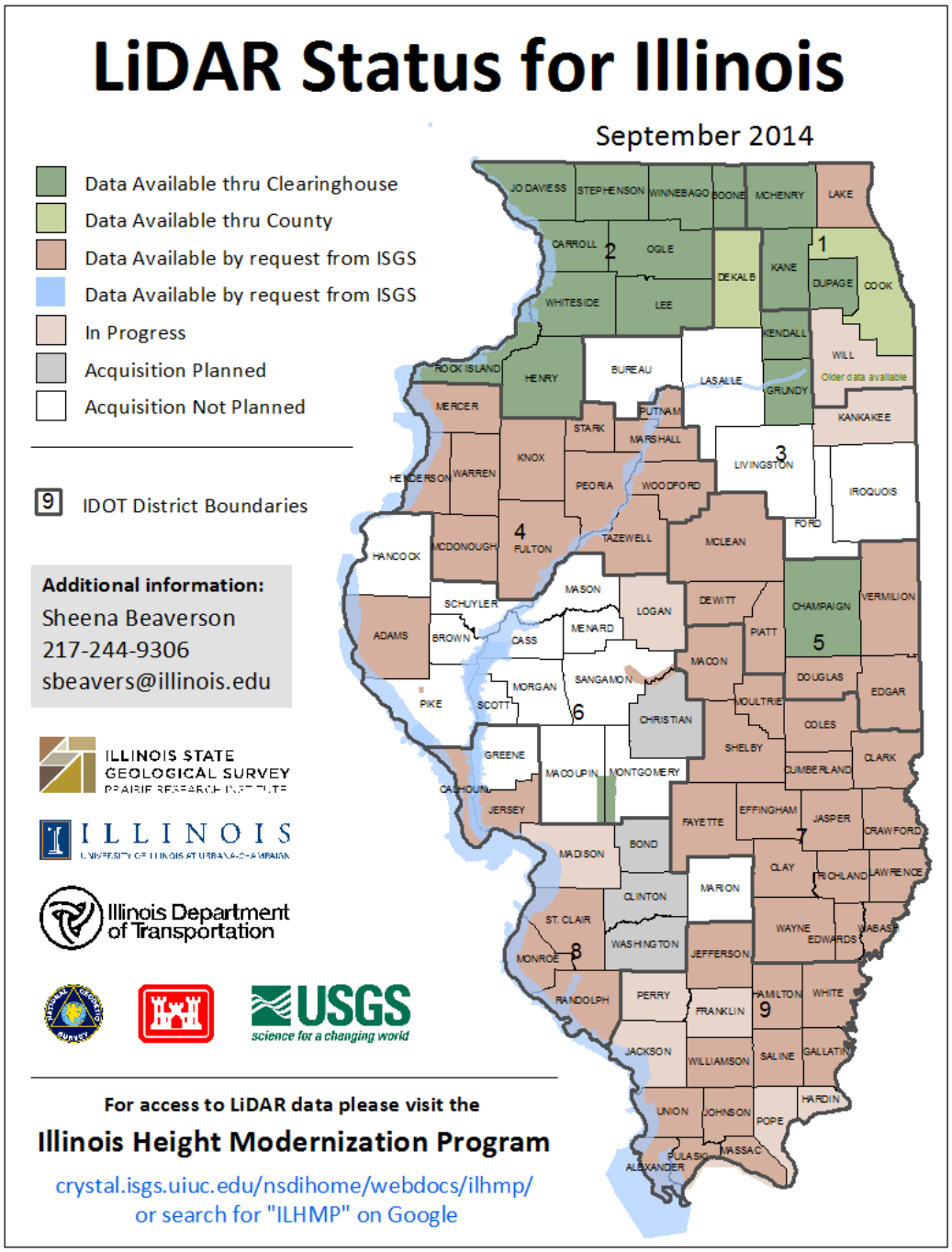
Data Types	Description	Source	Deliverable
Dams	Location of dams	U.S. Army Corps of Engineers - National Inventory of Dams, 1999 (Extracted from Hazus Database)	Discovery Map; Geodatabase
EPA 303(d) Streams	Streams included in the EPA 303(d) list of impaired streams.	U.S. EPA Office of Water	Discovery Map; Geodatabase
FEMA Public Assistance Grant Program	Location of public assistance grant projects	Federal Emergency Management Agency Region 5	Discovery Map; Geodatabase
HUC-8 Watershed Boundaries	Hydrologic Unit Code-8 scale watershed boundaries	USGS National Hydrography Dataset	Discovery Map; Geodatabase
Ice Jams	Location of ice jams	U.S. Army Corps of Engineers - Ice Jam Database	Discovery Map; Geodatabase
Letters of Map Change	Location of letters of map change	FEMA Mapping Information Platform Database	Discovery Map; Geodatabase
Levees	Location of levees considered for accreditation status by FEMA	FEMA Midterm Levee Inventory	Discovery Map; Geodatabase
Major Roads	Location of major roads	Illinois Department of Transportation, 2010	Discovery Map; Geodatabase
Special Flood Hazard Areas	Location of special flood hazard areas	FEMA Effective NFIP Maps	Discovery Map; Geodatabase
Stream Gages	Locations of stream gauges operated by multiple agencies	USGS Stream Gages	Discovery Map; Geodatabase
Streams of Concern	Streams categorized by level of concern determined by Illinois State Water Survey (ISWS) in-house process.	Region V Coordinated Needs Management Strategy Inventory \ ISWS	Geodatabase
Study Requests	Study requests collected though Discovery process and CNMS.	Illinois State Water Survey	Discovery Map; Geodatabase
Wetlands	Location and type of wetlands and deep water habitats	U.S. Fish and Wildlife Service National Wetlands Inventory	Discovery Map; Geodatabase

i. Data Used for Flood Risk Products

Topographic and Imagery Data

As part of the Illinois Height Modernization effort, the Illinois Department of Transportation (IDOT) is leading LiDAR data acquisition for Illinois counties scheduled by IDOT district. Figure 2 displays the LiDAR status for Illinois counties (ISGS, 2014).

Figure 2. LiDAR Status for Illinois



USGS Gages

The project team identified USGS stream gages in the watershed. The locations of the gages are shown on the Discovery map and listed in Table 3.

Table 4. USGS Stream Gages

Gage Number	Station Name and Location	Years of Record (Peaks)
05570900	SANGAMON RIVER NEAR FISHER, IL	N/A
05570910	SANGAMON RIVER AT FISHER, IL	32
05571000	SANGAMON RIVER AT MAHOMET, IL	31
05571500	GOOSE CREEK NEAR DE LAND, IL	9
05572000	SANGAMON RIVER AT MONTICELLO, IL	103
05572450	FRIENDS CREEK AT ARGENTA, IL	16
05572500	SANGAMON RIVER NEAR OAKLEY, IL	27
05573500	SANGAMON RIVER AT LAKE DECATUR, IL	N/A
05573540	SANGAMON RIVER AT RT 48 AT DECATUR, IL	28

ii. Other Data and Information

Mitigation Plans/Status, Mitigation Projects

Multi-Hazard Mitigation Plans (MHMPs) are prepared for unincorporated and incorporated communities to help communities reduce long-term risk to life and property from natural hazards. The plans include comprehensive mitigation strategies intended to promote flood-resilient communities. The project team reviewed the mitigation strategies in available MHMPs to determine which, if any, were relevant for the Discovery /Action Discovery process. Table 4 lists the MHMPs, their status, and their availability for review.

Table 5. MHMPs: Status and Availability

County	MHMP	Hazus	Issue Date	Expiration Date	Available for Review
Champaign	Expired	Y	1/15/2010	1/15/2015	Y
Christian	Y	Y	8/30/2011	8/30/2016	Y
DeWitt	N	N/A	N/A	N/A	N/A
Ford	N	N/A	N/A	N/A	N/A
Logan		N/A	3/18/2014	3/18/2019	Y
Macon	Y	Y	3/4/2014	3/14/2019	N/A
McLean	N	N/A	N/A	N/A	N/A
Moultrie	In Progress	N/A	N/A	2019	N
Piatt	Y	Y	2/14/2013	2/14/2018	Y
Sangamon	In Progress	Y	2008	2013	Y
Shelby	N	N/A	N/A	N/A	N/A

(IEMA, 2014)

CNMS and NFIP Mapping Study Needs

ISWS applied geospatial technologies to coordinate the management of mapping needs. The Coordinated Needs Management Strategy (CNMS) contains data for stream reaches to support existing and proposed flood mapping activities. An update and analyses of the CNMS data for the Upper Sangamon watershed are complete. Analyzed studies have been identified in Illinois as "VALID," "UNVERIFIED," and "UNKNOWN."

To provide a basis for prioritizing mapping needs in the watershed, a methodology was determined to rank streams based on several criteria. There are a number of flooding issues in the Sangamon River HUC8. The ISWS identified streams of concern by performing a spatial analysis of the data to determine where there are combinations of potentially unverified engineering data, high risk, and community concerns. Three sources of information were used for this initial screening task. The CNMS Phase III data are organized in a geospatial database of stream reaches attributed with an assessment of the engineering analyses as valid, unverified, or unknown. The FEMA National Flood Risk Analysis HUC Risk Data spatial data were used to provide relative risk ranking. The FEMA National Flood Risk Analysis HUC Risk Data is a Census Block Group GIS layer that contains aggregated flood claims data along with ten weighted parameters used to compute relative national risk (1 to 10 with 1 being highest risk) by Census Block Group. Study requests contained in the CNMS as well as local mapping concerns collected at the Discovery meeting were used to identify areas of known flooding issues.

A subset of stream segments was created by combining those stream segments identified as having engineering analyses that may no longer be valid (CNMS unverified) and any stream segment where comments collected indicate that the Special Flood Hazard Area (SFHA) mapping is inaccurate or inadequate. This subset of stream segments was then intersected with the HUC Risk Data and separated into two categories: high concern for those segments which flow through Census Block Groups with Risk Rankings between 1 and 5; medium concern for those segments which flow through Census Block Groups with Risk Rankings between 6 and 10. Stream segments outside the combined set were categorized as low concern. The entire list of categorized stream segments, including stream names, floodplain zones, stream lengths, and categories of concern, are provided in Appendix G. The stream segment categories are stored in the Discovery geodatabase as well as a GIS feature class derived from the CNMS. The feature class name is Streams of Concern.

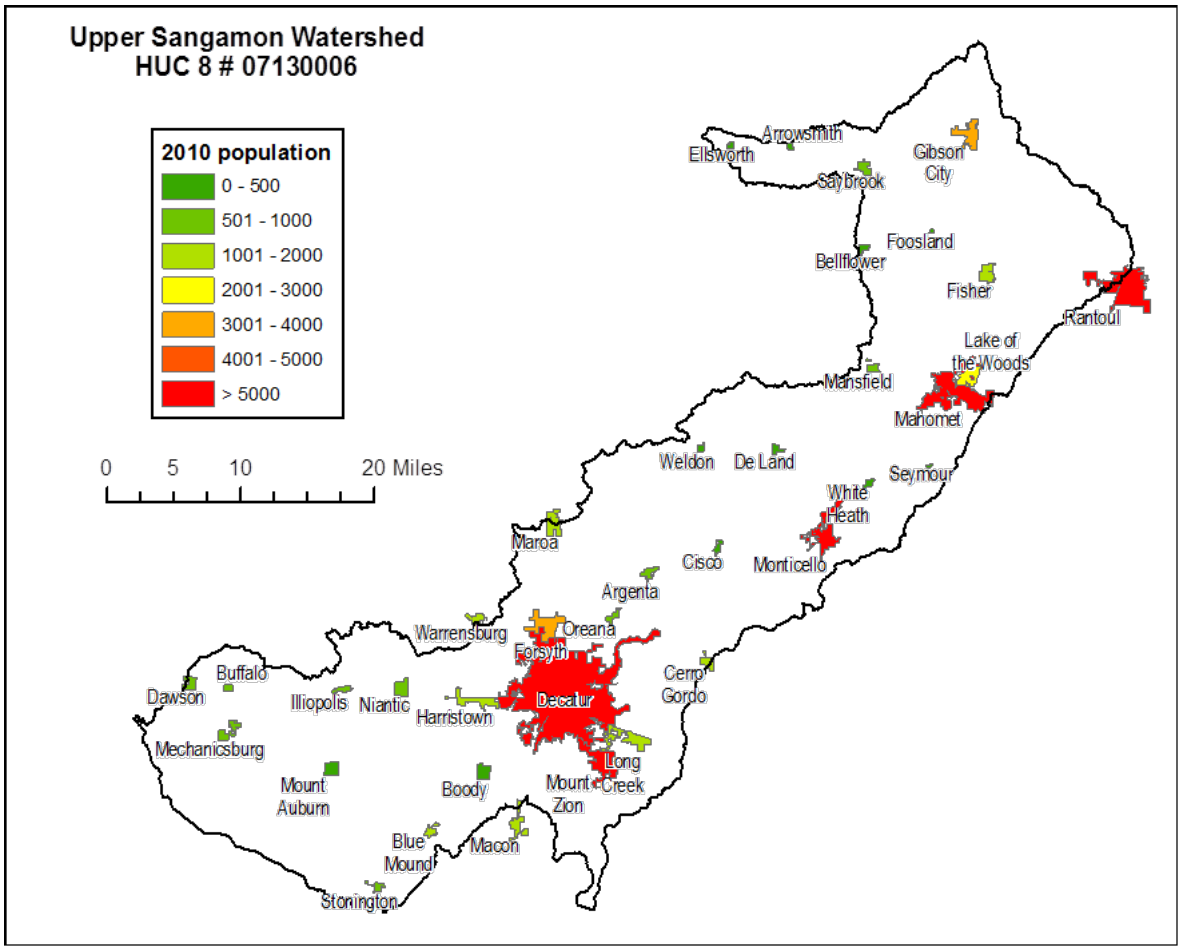
Table 6. Streams of Concern Categorization

Level of Concern	CNMS Status	Study Request	FEMA Risk Decile
High	Unverified	Yes/No	1-5
	Unknown	Yes	1-5
Medium	Unverified	Yes/No	6-10
	Unknown	Yes	6-10
	Valid	Yes	1-10
Low	Valid / Unknown	No	n/a

Demographics

The largest community within the Upper Sangamon River Watershed is the City of Decatur with a population of 76,122. Most communities within the watershed are smaller with a population of a few thousand or a few hundred.

Figure 3. Upper Sangamon Watershed Communities 2010 Population



During the past ten-year period, considerable population growth has taken place in the communities of Monticello, Mahomet, and Mt. Zion, whereas Decatur has undergone a decrease in population. See Table 6.

Table 7. Ten-Year Population Change in Communities With a Population Above 5000

Community	1990	2000	2009	2010
Monticello	4,549	5,138	5,374	5,548
Mahomet	3,103	4,877	6,664	7,258
Decatur	83,885	81,860	76,199	76,122
Mt. Zion	4,522	4,845	5,232	5,833

CRS

Within the Upper Sangamon watershed, Unincorporated Sangamon County is the only community that participates in the Community Rating System (CRS) program. It is currently rated at a level 8, which provides community members with a 10% discount on their flood insurance premiums.

Levees

Several levees exist in the study area that provide the county with some degree of protection against flooding. However, no levee systems are accredited by FEMA as providing protection from the 1% annual-chance flood.

Floodplain Management/CAVs

As the state coordinating agency for the National Flood Insurance Program, the Illinois Department of Natural Resources, Office of Water Resources, conducts Community Assistance Visits (CAVs) as part of their floodplain management programs. A CAV typically consists of a tour of the floodplain to assess any recent construction activities, a review of the local permitting process, and evaluation of the local floodplain ordinance. A meeting with the local floodplain official is held to discuss the NFIP, the local permitting process, any recent flood events, training opportunities, and any program deficiencies. Table 7 lists the communities in the watershed and the date of their latest CAV or Community Assistance Call (CAC).

Table 8. Recent CAV/CACs

Community	CAV	CAC
Champaign County	12/6/1994	N/A
Fisher	8/25/2004	N/A
Foosland	7/28/1993	N/A
Mahomet	8/26/2002	6/26/1994
Christian County	N/A	5/28/2009
Stonington	N/A	9/29/2000
DeWitt County	2/9/1998	9/11/2009
Logan County	2/7/2006	2/9/1995
Macon County	9/24/2014	N/A
Blue Mound	N/A	7/8/1999

Table 9. Recent CAV/CACs (continued)

Community	CAV	CAC
Decatur	5/28/2009	N/A
Forsyth	2/9/2006	N/A
Long Creek	N/A	7/8/1998
Mount Zion	N/A	9/22/2000
McLean County	2/9/1999	N/A
Piatt County	11/17/1994	9/11/2009
Deland	11/23/1999	6/24/1994
Monticello	N/A	7/24/1995
Sangamon County	1/27/1999	8/29/2012

(CIS, 2014)

Regulatory Mapping

As part of FEMA's Map Modernization program, ISWS has recently updated several of the countywide Flood Insurance Rate Maps (FIRMs) throughout the state of Illinois. Many of these maps are effective or in the final stages of map adoption. While these maps are in a digital format, they do not necessarily reflect newer hydrologic or hydraulic study information and therefore may not be the most accurate representation of flood risk within the watershed. Table 10 lists the Map Modernization activity in the Upper Sangamon watershed.

Table 10. Digital Flood Insurance Rate Map Status

County	Status	Effective Date
Champaign	Effective	10/2/2013
Christian	Effective	6/16/2011
DeWitt	Effective	11/2/2007
Ford	Not Funded	N/A
Logan	Effective	2/18/2011
Macon	Effective	6/16/2011
McLean	Effective	7/16/2008
Moultrie	Effective	7/18/2011
Piatt	Effective	6/16/2011
Sangamon	Effective	8/2/2007
Shelby	Not Funded	N/A

(CIS, 2014)

IV. Risk MAP Needs and Recommendations

The project team presented the Discovery map and discussed the results of the data collection and analysis with the watershed stakeholders in detail during the Discovery meetings. This section addresses the areas of concern and interest within the Upper Sangamon watershed that could be addressed with Risk MAP projects.

i. Funded Risk MAP project in HUC8

In addition to this Discovery Project, FEMA has funded some hydrologic and hydraulic engineering studies. During the Map Modernization, a multi-stream Special Problems Report was issued for streams in the environs of Decatur, Macon County. The following streams have discrepancies between the county and city effective base flood elevations: Sangamon River, Stevens Creek, Stevens Creek Tributary A, Stevens Creek Tributary B, Spring Creek, Spring Creek Tributary, Long Creek, and Long Creek Tributary/Big Creek Tributary. Effective studies for the main stem of the Sangamon River in this HUC8 are fragmented, out of date, and inadequate in areas of development.

FEMA-funded projects in this HUC8, as of the date of this report, are summarized below.

Mapping Activity Statement (MAS) No. ISWS10-07 Hydrology

The objective of the Risk MAP Project documented in this MAS is to develop hydrologic data for the Upper Sangamon Watershed and selected tributaries.

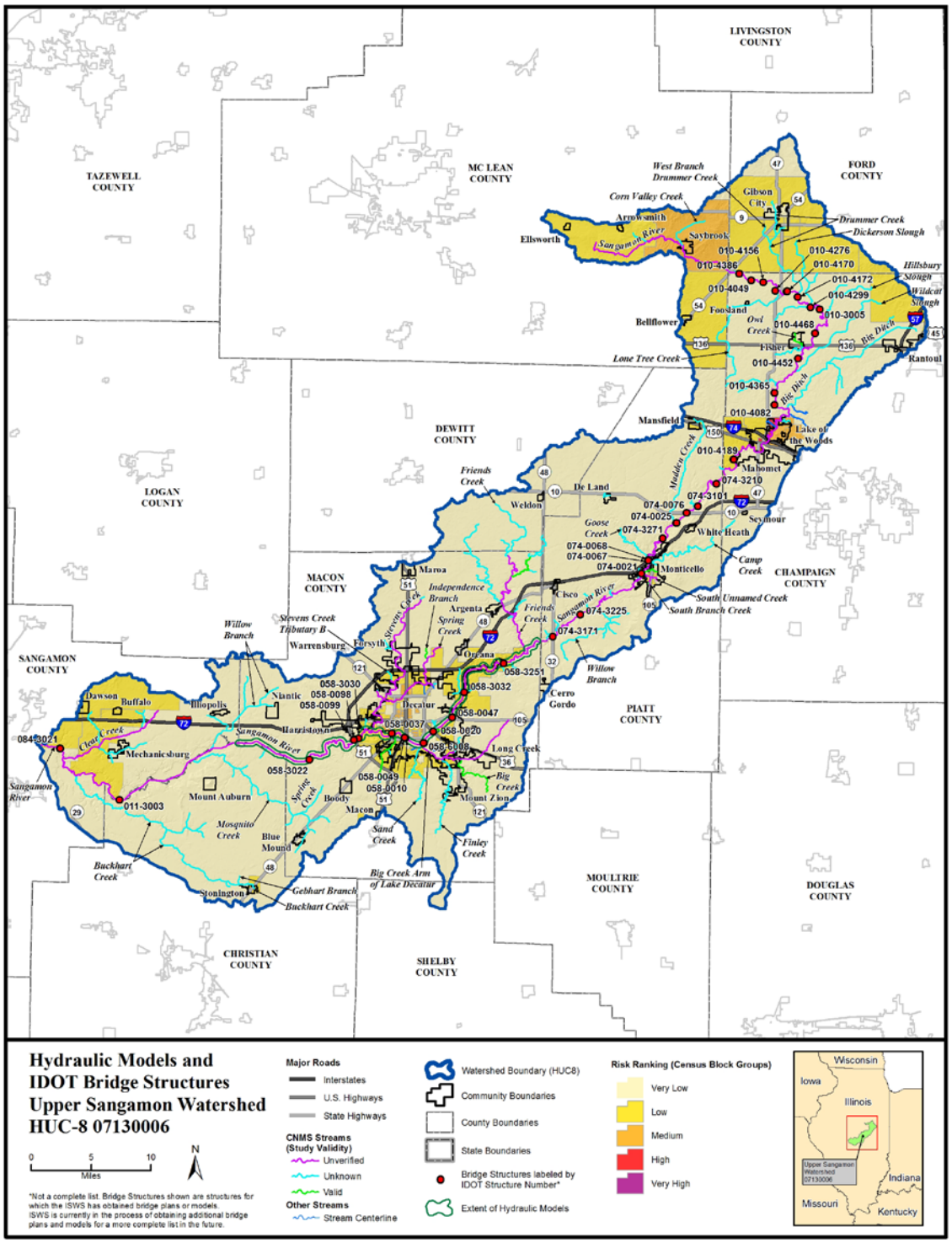
Study Area	Method	Square Miles of New Hydrology
Sangamon River Main Stem	Gaging station- Bulletin 17B (PEAK-FQ)	1443
Stevens Creek & Spring Creek	HEC-HMS	87
Long Creek	HEC-HMS	17.6

Mapping Activity Statement No. ISWS10-08 Hydraulics

The objective of the Risk MAP Project documented in this MAS is to utilize effective models to create updated executable hydraulic models based on available data that better reflect current conditions for the main stem of the Sangamon River in the Upper Sangamon Watershed HUC 07130006. Effective models are HEC2 and are only available in paper format. Preparation of HEC-RAS models from the effective model input data and other available information is a first step in a planned hydraulic study of the entire main stem of the Sangamon River in the Upper Sangamon Watershed.

As part of the tasks under MAS ISWS10-08, copies of the input and output from FEMA effective hydraulic models were located as well as structure data (bridges and culverts) and other models such as those for bridge replacements or other non-flood related projects. The availability of these data is illustrated in Figure 4.

Figure 4. Hydraulic Models and IDOT Bridge Structures



Mapping Activity Statement No. ISWS10-14 Discovery

The objective of the Risk MAP Project documented in this MAS is to perform Project Identification, Perform Project Outreach (Discovery Meeting only), and prepare a Discovery Report for the Upper Sangamon watershed, identified as HUC 07130006.

Mapping Activity Statement No. ISWS11-18 Hydraulic Study of Spring and Stevens Creeks, Upper Sangamon Basin, Macon County

The objective of the Risk MAP Project documented in this MAS is to perform hydraulic analyses that will support an update of the Digital Flood Insurance Rate Map (DFIRM) and Flood Insurance Study (FIS) report for Macon County, Illinois. This project is another step in a multi-year Risk MAP project for the Upper Sangamon River Basin (HUC07130006). ISWS has performed hydraulic analyses for approximately 40.1 miles (37.9 miles, updated effective study and 2.2 miles, new study) of the flooding sources listed in the table below. The modeling includes the 10-, 4-, 2-, 1- and 0.2% annual-chance events, based on peak discharges computed under Hydrologic Analyses (MAS ISWS10-07). The HEC-RAS computer program was used. In addition, a depth grid will be developed for newly studied areas.

ISWS used the cross-section and field data collected by the IDNR/OWR and the topographic data provided by the county, where appropriate, to perform the hydraulic analyses. The hydraulic analyses will be used to establish flood elevations and regulatory floodways for the subject flooding sources. The hydrologic and hydraulic models were submitted to IDNR/OWR for review and concurrence and have not yet received IDNR-OWR approval (as of 2/6/2015).

Study Area	Method	Total Miles of New Base level or Enhanced Level Hydraulics
Spring Creek	HEC- RAS / Geo-RAS	18.8
Stevens Creek	HEC-RAS / Geo-RAS	21.3

ii. Floodplain Studies

While DFIRMs have been produced for many of the counties in the watershed, there are still study and mapping needs. Using input from community stakeholders, ISWS has identified several areas where new or updated studies rank highest in terms of need and risk relative to other locations in the Upper Sangamon HUC8.

The entire length of the Sangamon River in this HUC8 is identified in CNMS as "unverified." Of note are the numerous comments and requests for detailed study of the Sangamon River upstream and downstream of Mahomet due to subdivision development. This is a result of the consistent population growth recorded for the City of Mahomet in Table 6.

The need for new studies for Spring and Stevens Creeks was identified through the Map Modernization process. During Discovery it was noted that new studies were already funded; therefore no community requests for study were recorded. While these

engineering studies have been funded, no funds have been obligated to update the Flood Insurance Rate Maps and Study.

A review of the modeling of the Sangamon River through the Lake Decatur Dam indicates that a more robust model is needed to route the flows with consideration to the current gate operation policy.

In the City of Monticello it was noted that the effective models and floodplain mapping for the South Unnamed Creek and the North Unnamed Creek do not reflect existing conditions. The North Unnamed Creek presents a flooding hazard with evacuations periodically needed. There is interest in mitigation projects going forward.

One goal of the floodplain mapping program is to have a high quality, model-based floodplain mapped for all streams that drain greater than approximately 1 square mile or more. While the mapping needs listed in the following table are the highest ranking stream reaches for modeling based on the data collected during this Discovery process, there are other mapping needs that also should be included in any project proposed for this basin. Additional needs are documented in CNMS. Appendix G lists the additional mapping needs required to fully meet this goal.

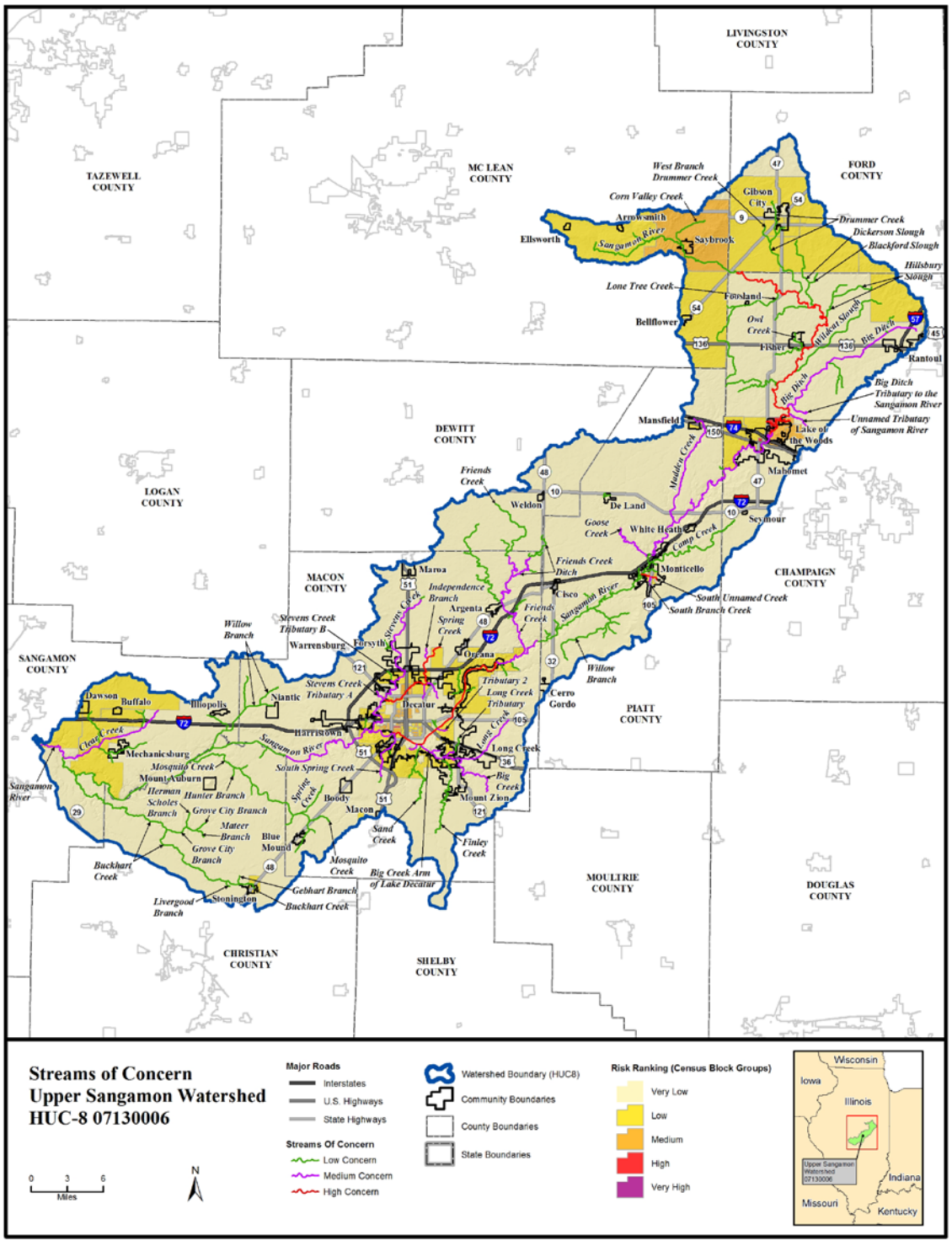
Table 11. Study Needs

Flooding Source	Study Length (Miles)	Current Study Type
Sangamon River	32.35	A
Sangamon River	14.14	AE
South Unnamed Creek	1.55	AE
Spring Creek	3.99	AE
Spring Creek	6.01	AE
unnamed	1.28	A
Big Creek	6.28	AE
Big Creek Arm of Lake Decatur	2.70	AE
Big Ditch	15.07	A
Big Ditch tributary to the Sangamon River	2.14	None
Clear Creek	11.26	AE
Friends Creek	14.43	AE
Friends Creek Ditch	4.16	AE
Goose Creek	5.39	A
Independence Branch	1.06	AE
Lake Decatur	0.81	
Long Creek	1.69	AE
Long Creek (East of Big Creek)	6.30	AE
Long Creek Tributary	1.23	AE

Table 12. Study Needs (Continued)

Flooding Source	Study Length (Miles)	Current Study Type
Madden Creek	12.36	A
Northeast Drainage Ditch	1.25	None
Sangamon River	3.07	A
Sangamon River	4.21	A
Sangamon River	7.33	AE
Sangamon River	13.42	A
Sangamon River	4.38	AE
Sangamon River	5.43	AE
Sangamon River	14.00	AE
South spring Creek	5.05	AE
Stevens Creek	1.06	AE
Stevens Creek	1.54	AE
Stevens Creek	6.98	AE
Stevens Creek	9.88	AE
Stevens Creek Tributary A	1.28	AE
unnamed	1.06	A
unnamed	1.36	None
unnamed tributary to Sangamon River	2.42	None

Figure 5. Streams of Concern



iii. Mitigation Projects

At the Discovery and Action Discovery meetings, community stakeholders identified several locations in which mitigation projects could reduce or eliminate the impacts of flooding. Topics of mitigation interest included residential flooding, roads that frequently flood, significant riverine erosion, at-risk essential facilities, streamflow constriction, and study needs for stormwater management plans resulting from recent and/or future development. The following mitigation projects were identified during the Discovery and Action Discovery meetings.

Table 13. Mitigation Projects

Community	Subject(s)	Project	Status	Comment Number
Champaign County	Overtopped Road	Replace bridge on Wildcat Slough	Identified	79I
Decatur, IL	Overtopped Road	McKinley Avenue frequently overtops (closed 06/22/2010). Flooding is from a ditch immediately connected to Spring Creek. Enlarge ditch size, increase ditch slope, remove downstream restrictions.	Identified	73A
Decatur, IL	Overtopped Road	North Country Club Road overtopped. There's a large, undeveloped area just upstream of the road that could possibly be turned into a wetland or used for compensatory storage.	Identified	74A
Decatur, IL	Residential Flooding	Mound Road by Spring Creek /Flooded properties in and along the floodplain of Spring Creek by Mound Road. Study and upstream storage needed.	Identified	25A / MAF 281
Decatur, IL	Residential Flooding	Meadowlark Subdivision /Flooded properties and roads within subdivision. Detention upstream of subdivision needed. Study and management plan needed.	Identified	25 B / MAF 282
Decatur, IL	Residential Flooding	Northeast Drainage Ditch / detention upstream of subdivision needed. Study needed to determine best stormwater management plan.	Identified	25 C / MAF 283
Decatur, IL	Meadowlark Bridge Replacement	Resize bridge for larger flood event	Incomplete	MAF 281
Decatur, IL	Grays Lane Erosion	Stabilize erosion with stream stabilization project on Stevens Creek and stable swale directing runoff from Grays Lane to stream	Incomplete	MAF 290
Harristown, IL	Overtopped Roads	Enlarge culverts	Identified	80

Community	Subject(s)	Project	Status	Comment Number
Illiopolis, IL	Area of Flooding	Replace antiquated storm sewers	Identified	15
Macon County	Roads Overtopped	Enlarged culverts	Complete	70
Macon County	Residential Flooding	Repetitive loss properties on Pin Oak Lane, E. Lost Bridge Road, Kruse Road. Buy-outs in progress.	Identified	14A MAF 280
Macon County	Candlebrook Estates Flooding	Stormwater study needed to identify sources of flooding	Identified	14B
Macon County	Areas of Mitigation Success	Conservation District developed a wetland on both sides of Rock Springs Road	Complete	46
Macon County	Areas of Mitigation Success	Long-term conservation easements	Ongoing	60A
Mahomet, IL	Areas of Mitigation Success	Installation of a new Illinois Route 47 highway bridge with wider and enlarged opening occurred during 2010.	Complete	77E
Mahomet, IL	Overtopped Road Bridge	Raise the road bridge on County Road 2500 North	Identified	1N
Mahomet, IL	Development / Sangamon River Flooding / Study Need	Rapid Development. Sangamon River from Lake of the Woods Park north to Township Road 2600 N. should be studied.	Identified	MAF 206
Monticello, IL	Overtopped Road	Repair culverts near Goose Creek	Identified	2
Monticello, IL	Residential Flooding	Study and management plan needed.	Identified	3
Monticello, IL	Areas of Mitigation Success	Culvert was recently extended from Colfax Street (+/-7600) downstream to approximately +/-6500;	Complete	3.2
Monticello, IL	Areas of Mitigation Success	Many years ago the culvert was extended from Washington Street (+/-7,700) upstream to beyond limits of study of South Unnamed Creek	Complete	3.3
Monticello, IL	Undersized Bridge Opening	Tributary of Friends Creek Ditch Bridge	Identified	4
Monticello, IL	Areas of Mitigation Success	Detention basin project to alleviate flooding near the Junior High School	Complete	85
Piatt County	Roads Overtopped	Sangamon River bridge located on Shady Rest Road south of Route 10 (2150N 1125E) was raised and opening enlarged.	Complete	41
Piatt County	Roads Overtopped	New Sangamon River Bridge located about ½ mile north of Route 10 on the 1300 East road.	Complete	22
Piatt County	Areas of Mitigation Success	IL EPA, Bureau of Water set up a grant to clean out and remove log jams and river clean out of top soil.	Complete	99

Community	Subject(s)	Project	Status	Comment Number
Sangamon County	Areas of Mitigation Success	Buy-outs completed.	Complete	16B
Sangamon County	Roads Overtopped	Structure Replacement at I-72 and Sangamon River	Scoped	19A
Sangamon Watershed Area	Areas of Mitigation Success	Entire watershed has USDA Conservation Reserve Enhanced Program (CREP)	Ongoing	96
Stonington, IL	Area of Flooding	Bridge Replacement	Complete	18A

Community Mitigation Projects

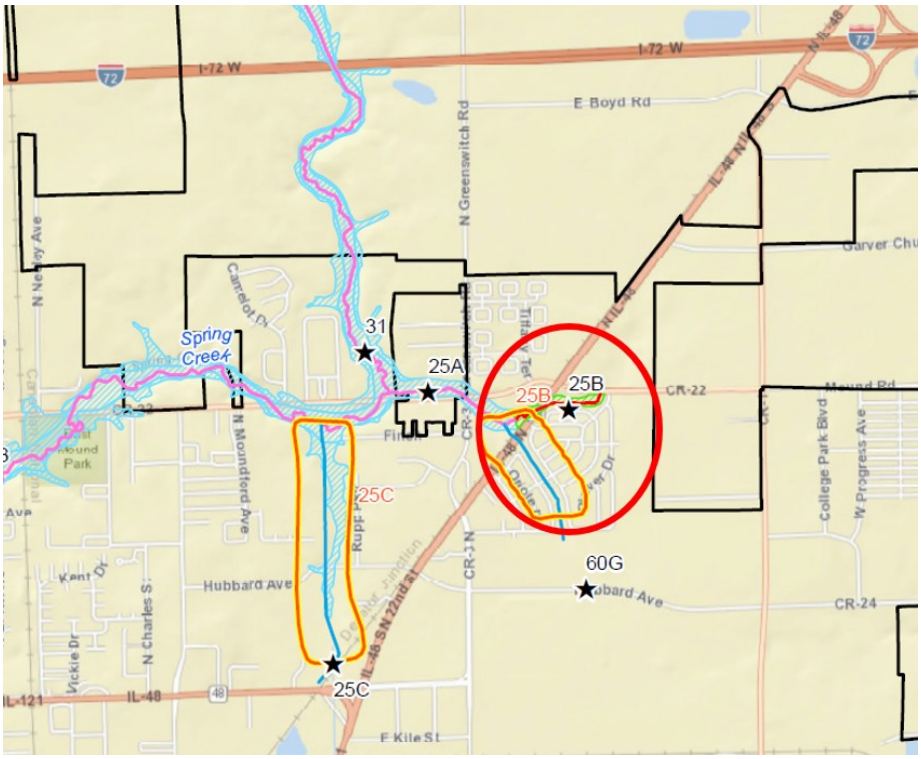
Following the Discovery and Action Discovery meetings, comments were reviewed and additional community outreach was conducted to help identify high priority community mitigation projects within the Upper Sangamon River watershed area. The high priority mitigation projects are described in the following narratives.

Meadowlark Subdivision – City of Decatur, Macon County
Comment 25B

The Meadowlark Subdivision within the City of Decatur is bounded on the north by Spring Creek Tributary and on the Northwest by IL-48. Spring Creek Tributary East flows through the subdivision from the Southeast to the Northwest. Comments received during Action Discovery indicate several properties and roadways within the Meadowlark Subdivision are subject to regular flooding. The subdivision was developed in the 1960s. Plover Drive was intended to be a second bridge across Spring Creek Tributary East, but was fashioned into a concrete spillway in the 1990s to assist with flooding.

The upstream portion of the Spring Creek Tributary East watershed includes a large percentage of impervious surface within an industrial complex. The flooding in Meadowlark Subdivision may be due to a combination of excess runoff originating from the large, upstream impervious surface; an undersized stream channel providing inadequate capacity; or an undersized stormwater system within the subdivision. Currently, the Spring Creek Tributary and Spring Creek Tributary East are being assessed by ISWS with a detailed study, including floodway analysis (MAS11-18). Spring Creek Tributary East is classified as assessed within CNMS and Spring Creek Tributary is classified as unknown within CNMS.

A stormwater study in this area would determine what type of management may improve flooding conditions within the subdivision, both for present conditions and for future conditions. Areas of undeveloped land drain to Spring Creek Tributary and Spring Creek Tributary East, so without a management plan for current flooding issues, this area is liable to worsen with future development.



Meadowlark Subdivision Flood Risk Area

Photograph of Meadowlark Subdivision from the 2010 flood event.

June 22, 2010 event, on Meadowlark Dr. bridge looking southeast (upstream)

Spring Creek Tributary and Spring Creek Tributary East

Bridge Replacement, Meadowlark Subdivision – City of Decatur, Macon County

The Meadowlark Drive bridge between Hummingbird Drive and Whippoorwill Drive in Meadowlark Subdivision, Decatur conveys the Spring Creek Tributary East northwest through the Meadowlark Subdivision to its confluence with Spring Creek. The Meadowlark Bridge is currently 34.5' wide and approximately seven feet high and is sized for a small storm event (approximately 20% annual chance storm event) and causes upstream flooding within the subdivision during larger storm events, according to a comment received from Mary Cave, Decatur City Engineer, during Action Discovery. The Spring Creek Tributary East is part of the ISWS detailed study of Spring and Stevens Creeks (MAS11-18), and is classified as assessed within CNMS.

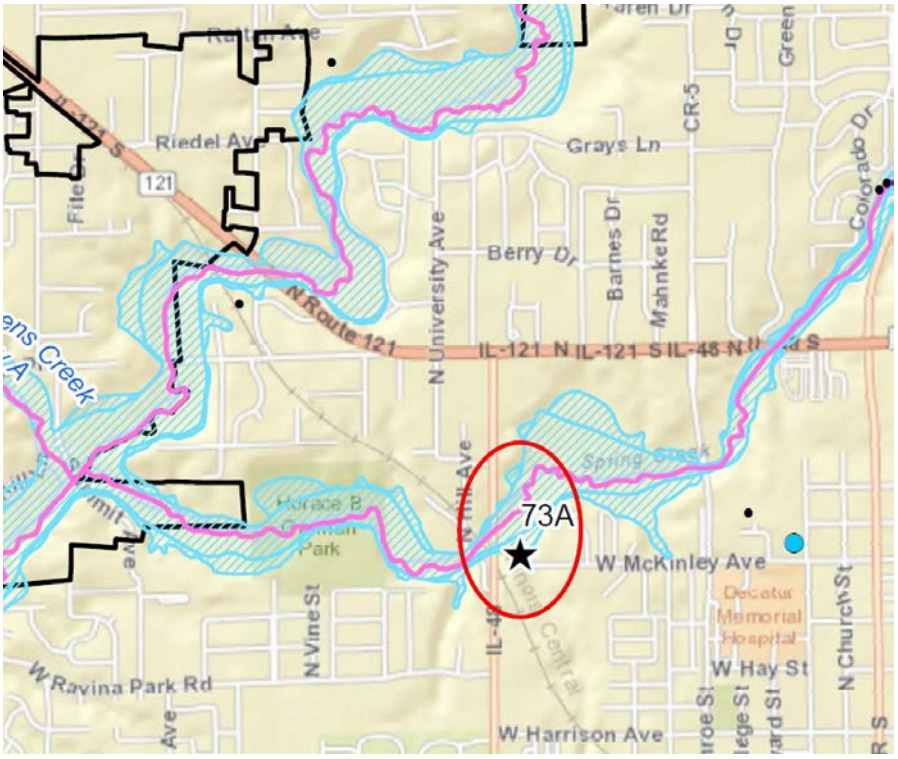
A study to determine the correct size of the bridge, for both current and future watershed conditions, would lead to mitigation of upstream flooding in the subdivision and identify areas in the watershed that are exacerbating flooding, so mitigation plans can be developed to address them. The City of Decatur may be able to use Motor Fuel Tax funds to reconstruct this bridge with a larger opening if the study and design complies with the IDOT Drainage Study requirements.

Meadowlark Bridge

McKinley Avenue Flooding – City of Decatur, Macon County
Comment 73A

West McKinley Avenue, a local collector street that services Decatur Memorial Hospital, begins where Spring Creek intersects with IL-48. On the north side of McKinley Avenue, a ditch parallels the road and drains into Spring Creek. During storm events flooding occurs in the ditch and overtops McKinley Avenue, creating a driving hazard and potentially eliminating an ingress/egress route for a critical facility. Driver reports of McKinley Avenue being overtopped are frequent; occasionally the road needs to be closed for safety. Spring Creek is a detailed study with floodway and classified as unverified within CNMS.

Solutions to this flooding challenge include: enlarging the size of the ditch, increasing the slope of the ditch, eliminating downstream restrictions, or a combination of several alternatives. The latest floodplain mapping shows minimal flooding in this area, so the problem may be localized or influenced by Spring Creek backwater. Hydrologic and Hydraulic Analysis must be performed to determine the full nature of the flooding condition. Upon identifying the underlying conditions of the flooding, actions to mitigate might include altering the ditch to accommodate the amount of drainage reaching the ditch, improving or diverting local drainage paths, or adjusting outlet configurations on the adjacent stormwater detention basin.

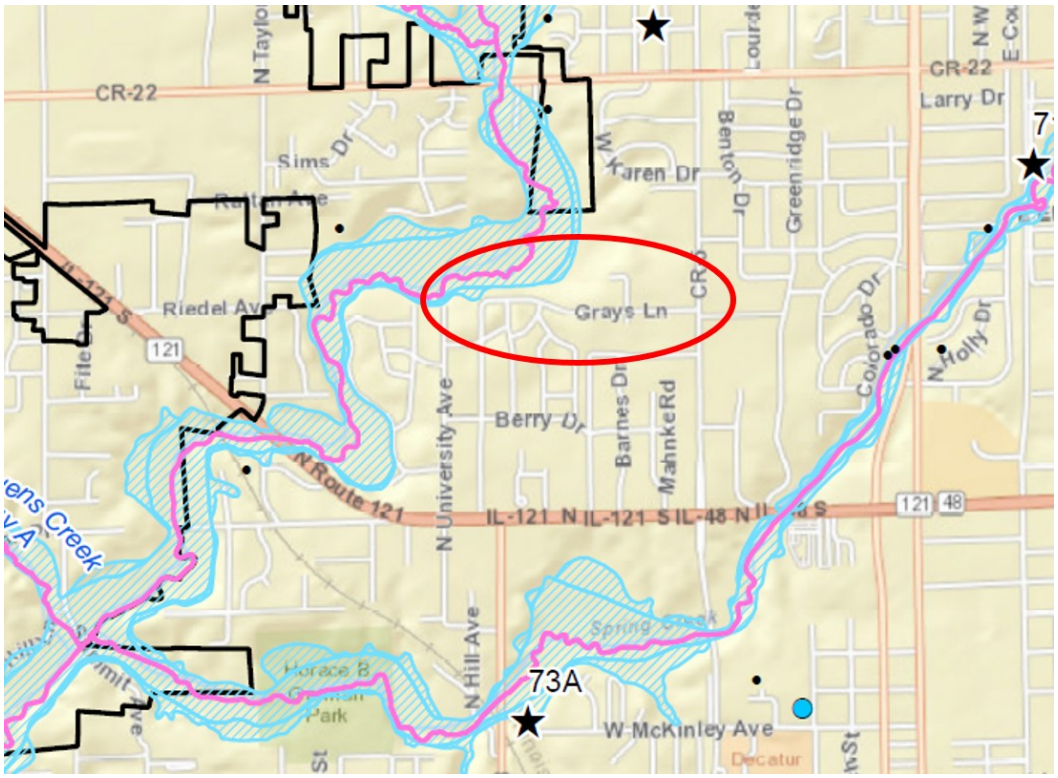


McKinley Avenue Flood Risk Area

Grays Lane Erosion – City of Decatur, Macon County

Grays Lane is a residential street located on the north side of Decatur, north of IL-121 N and south of CR-22. It is situated east of Stevens Creek. According to Mary Cave, PE, erosion from Stevens Creek along Grays Lane is threatening residential structures and causing damage to property. Stevens Creek is a detailed study with floodway and classified as unverified within CNMS.

The erosion problem could be mitigated by stream stabilization of Stevens Creek along the meander near Grays Lane, or by the constructing a stable swale to direct runoff from Grays Lane towards Stevens Creek.



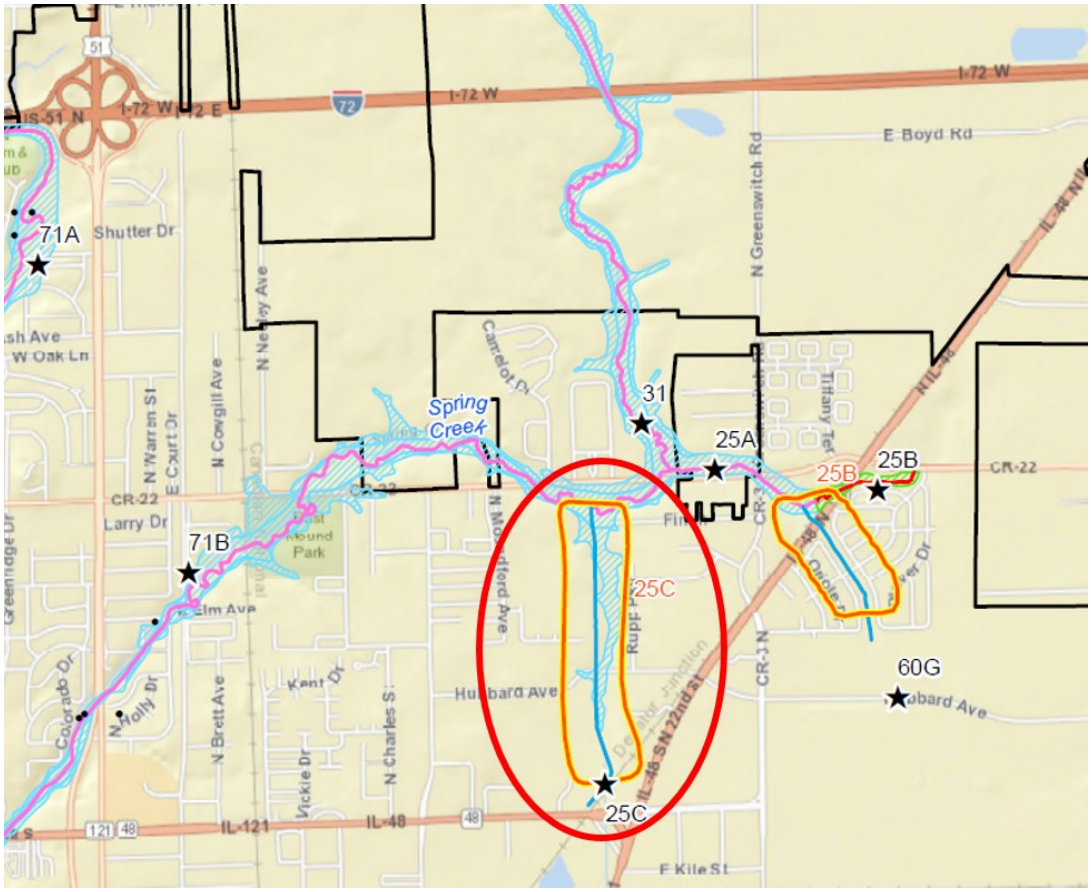
Grays Lane Erosion Area

Northeast Drainage Ditch – City of Decatur, Macon County
Comment 25C

The Northeast Drainage Ditch originates from a large detention basin at the intersection of Pershing Road and N 22nd Street in the City of Decatur. It runs due north to confluence with Spring Creek near E Mound Road. Structures along the stream include a large three-opening culvert underneath Hubbard Avenue and a small dam with culvert opening between Hubbard Avenue and the confluence with Spring Creek. Comment 25C, received

during Action Discovery, indicates that Northeast Drainage Ditch has inadequate capacity for the amount of drainage reaching this waterway. Several properties flood along the ditch. The latest ISWS floodplain maps (pending approval) show one building within the 1% annual chance floodplain along Northeast Drainage Ditch. Currently, the Northeast Drainage Ditch is being assessed for a detailed study with floodway and is classified as assessed within CNMS.

A study within this area would determine what type of stormwater management may improve flooding conditions along the ditch, both for present conditions and future conditions. Potential land for future development lies within the drainage area for Northeast Drainage Ditch, so a management plan to address present and future flooding issues in this area is appropriate.



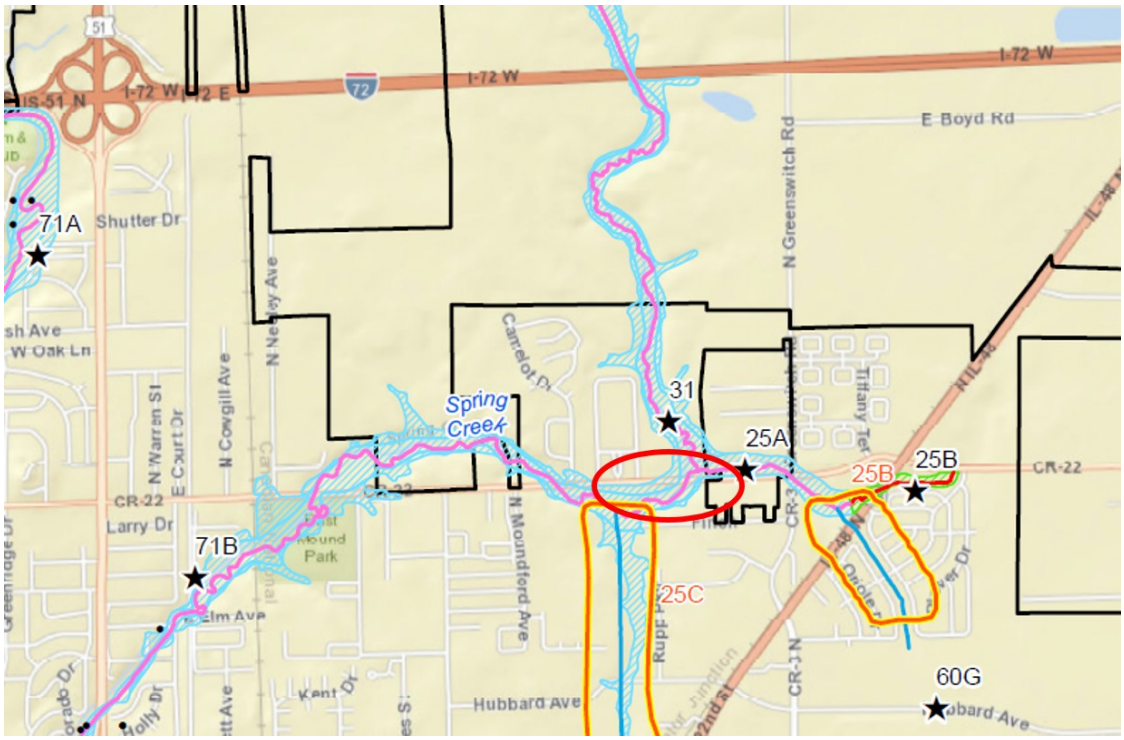
Northeast Drainage Ditch Flood Risk Area

Northeast Drainage Ditch

Flooding at Mound Road – City of Decatur, Macon County
Comment 25A

Several properties along Mound Road flood on a regular basis. These properties are along Spring Creek, immediately downstream of the Spring Creek Tributary confluence, on Mound Road and E. Finch Drive. These properties are within the 1% annual chance floodplain, but may flood during more frequent flood events as well.

A study could be completed to determine areas of additional storage either in this area or upstream of this area to protect the properties. The properties have not been identified as repetitive loss, so they are ineligible for FEMA's buy-out program. Determining safe areas of flooding away from these properties will drop water surface elevations at this location, helping to mitigate flooding to these properties.

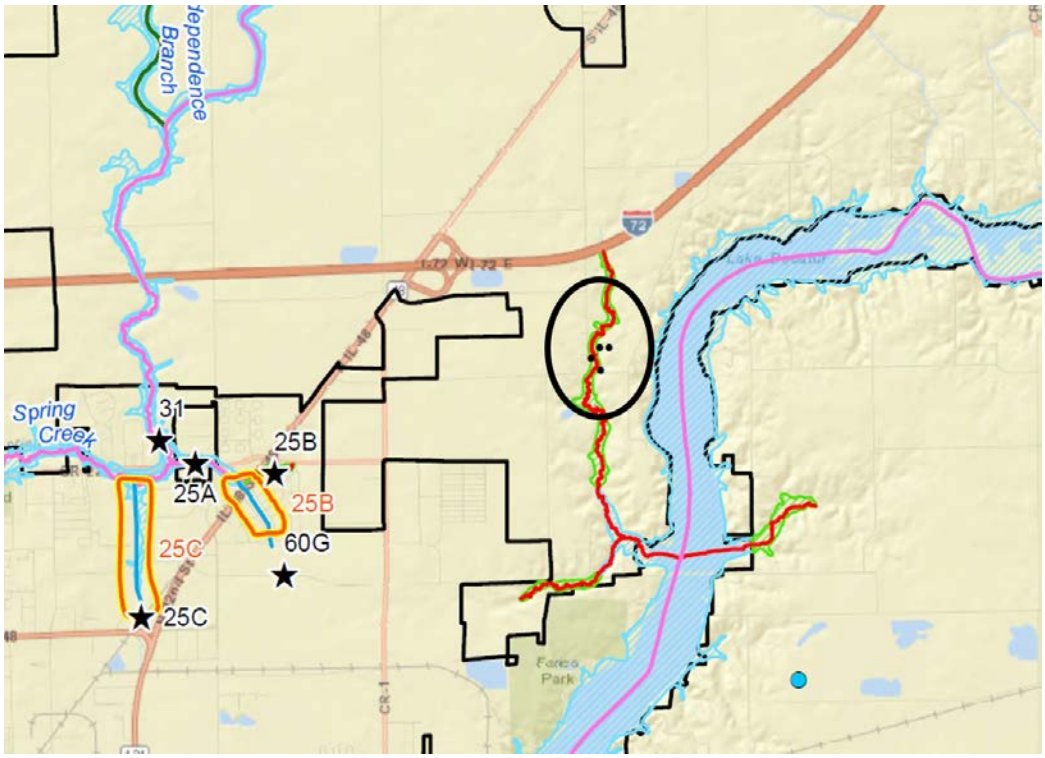


Mound Road Flood Risk Area

Mound Road Flood Risk Area

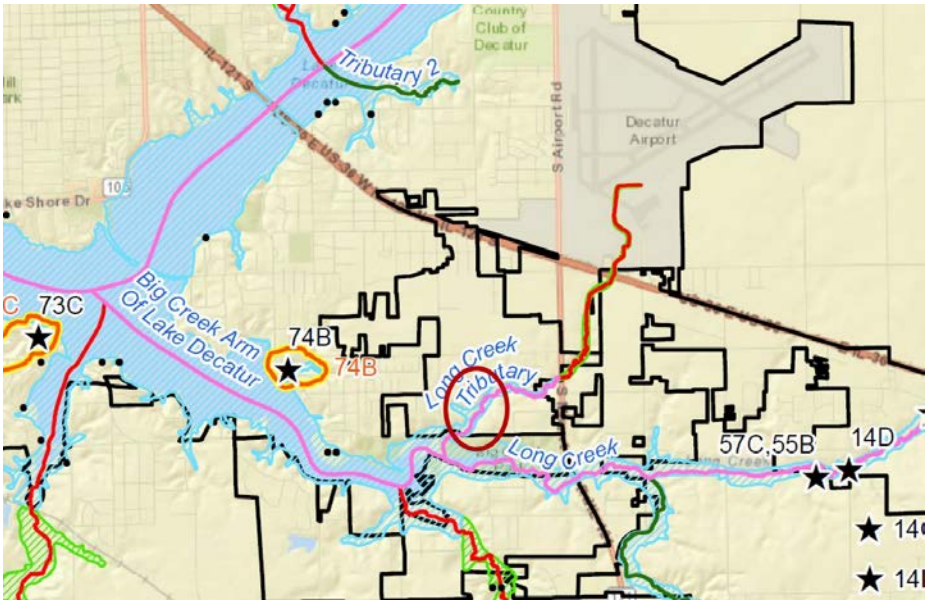
Repetitive Loss Properties on Pin Oak Lane, Lost Bridge Road, and Kruse Road – Macon County
Comment 14A

Pin Oak Lane crosses an Unnamed Tributary to Lake Decatur, east of the city. Properties on this lane have suffered repetitive loss due to flooding events. The best mitigation for this flooding problem is to buy-out the properties and demolish the structures to avoid future repetitive loss. Macon County officials are seeking funding for all of the buy-outs. The property owner on Pin Oak Lane has been contacted by the community concerning a possible buy-out of their property. The Unnamed Tributary to Lake Decatur is a Flood Zone A study with an unknown CNMS classification.



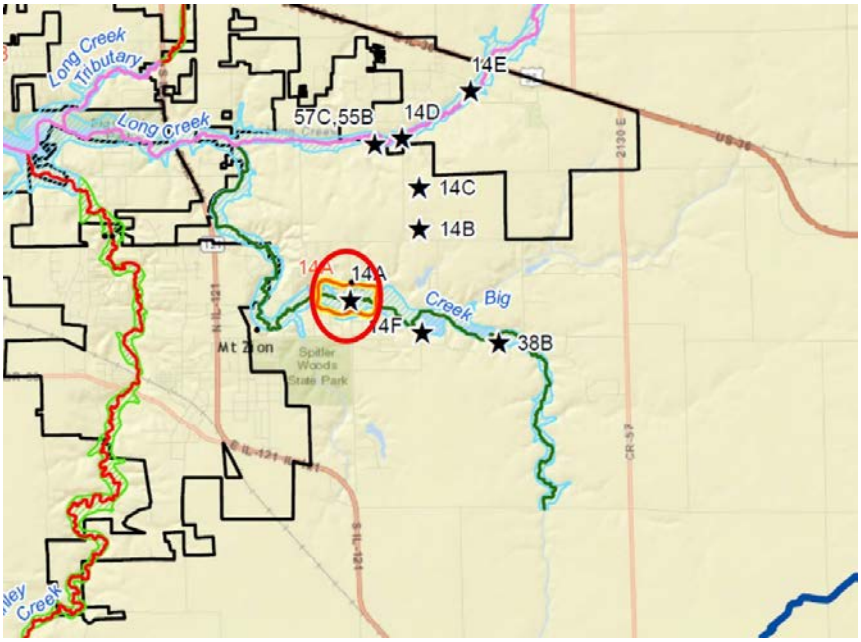
Unnamed Tributary to Lake Decatur Flood Risk Area

East Lost Bridge Road runs along the eastern shoreline of the Big Creek Arm of Lake Decatur. Long Creek Tributary crosses E. Lost Bridge Road before it confluences with Long Creek and flows into Lake Decatur. Properties have undergone repetitive loss from flooding where E. Lost Bridge Road crosses over Long Creek Tributary. To solve this flooding problem, a buy-out of the properties would mitigate the flooding and prevent future repetitive loss in the area. The property owner on East Lost Bridge Road has been contacted by the community and has committed to the buy-out. Long Creek Tributary is a detailed study and classified as unverified within CNMS.



Long Creek Tributary Flood Risk Area

Big Creek, southeast of Decatur, crosses Kruse Road and causes repetitive loss due to flooding of property. Buy-outs of these properties would prevent future loss from flooding and mitigate current flooding issues. The property owners on Kruse Road have been contacted by the community and have committed to the buy-outs. Big Creek is a detailed study and classified as valid within CNMS.

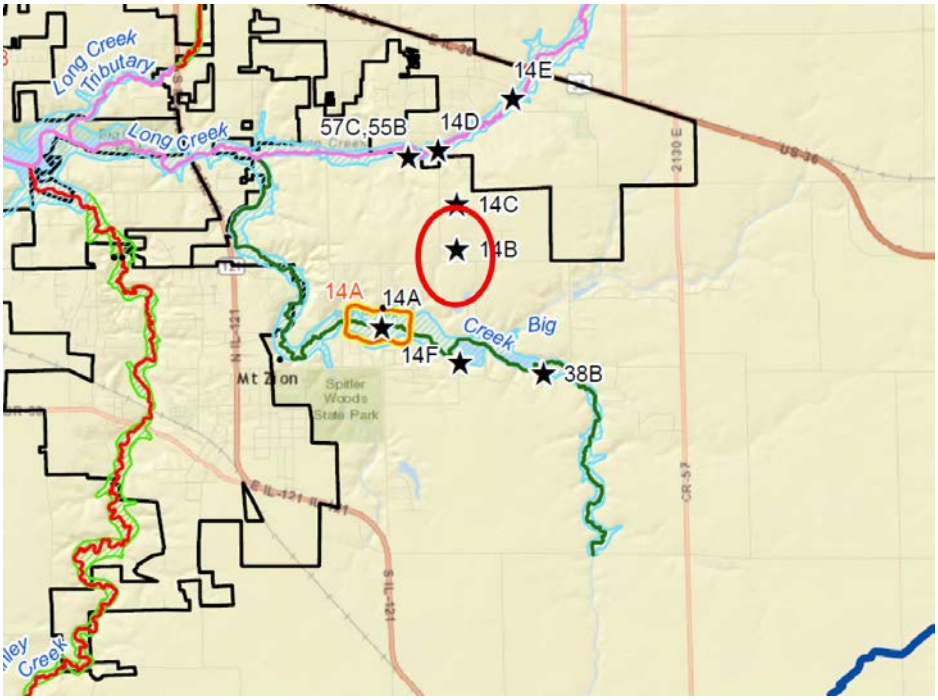


Big Creek Flood Risk Area

Candlebrook Estates –Macon County
Comment 14B

The subdivision of Candlebrook Estates lies to the southeast of Decatur, in Macon County, at the corner of Long Creek Road and Camp Warren Road. It is a neighborhood less than ten years old that is surrounded by farm fields and open space. During rain events, the streets and lawns of residents flood on a regular basis. The photographs below show severe road flooding and overland flow from the surrounding farm fields that contribute to the flooding problems.

It appears that several issues are contributing to the flooding problem in Candlebrook Estates. The first issue involves excess overland flow from adjacent property draining into the subdivision. Related to that issue, the adjacent property has a high percentage of exposed soil, which, when combined with high velocities of overland flow, produces sediment deposition within the neighborhood. The second issue is the inability of the subdivision's stormwater system to effectively manage the volume of water reaching the neighborhood. A stormwater study to accurately determine how much water is coming from which adjacent property is the first step to mitigating flooding in this area. Once calculations are performed, possible mitigation actions include a diversion channel or grass swale to direct overland flow around the subdivision to a safe area downhill, or a detention facility uphill of the subdivision. The current stormwater system capacity should also be investigated for a possible retrofit to handle excess water.



Candlebrook Estates Flood Risk Area

Candlebrook Estates

Streets within Candle Brook Estates flood after large rain events.

Runoff from neighboring farm fields contributes to the flooding

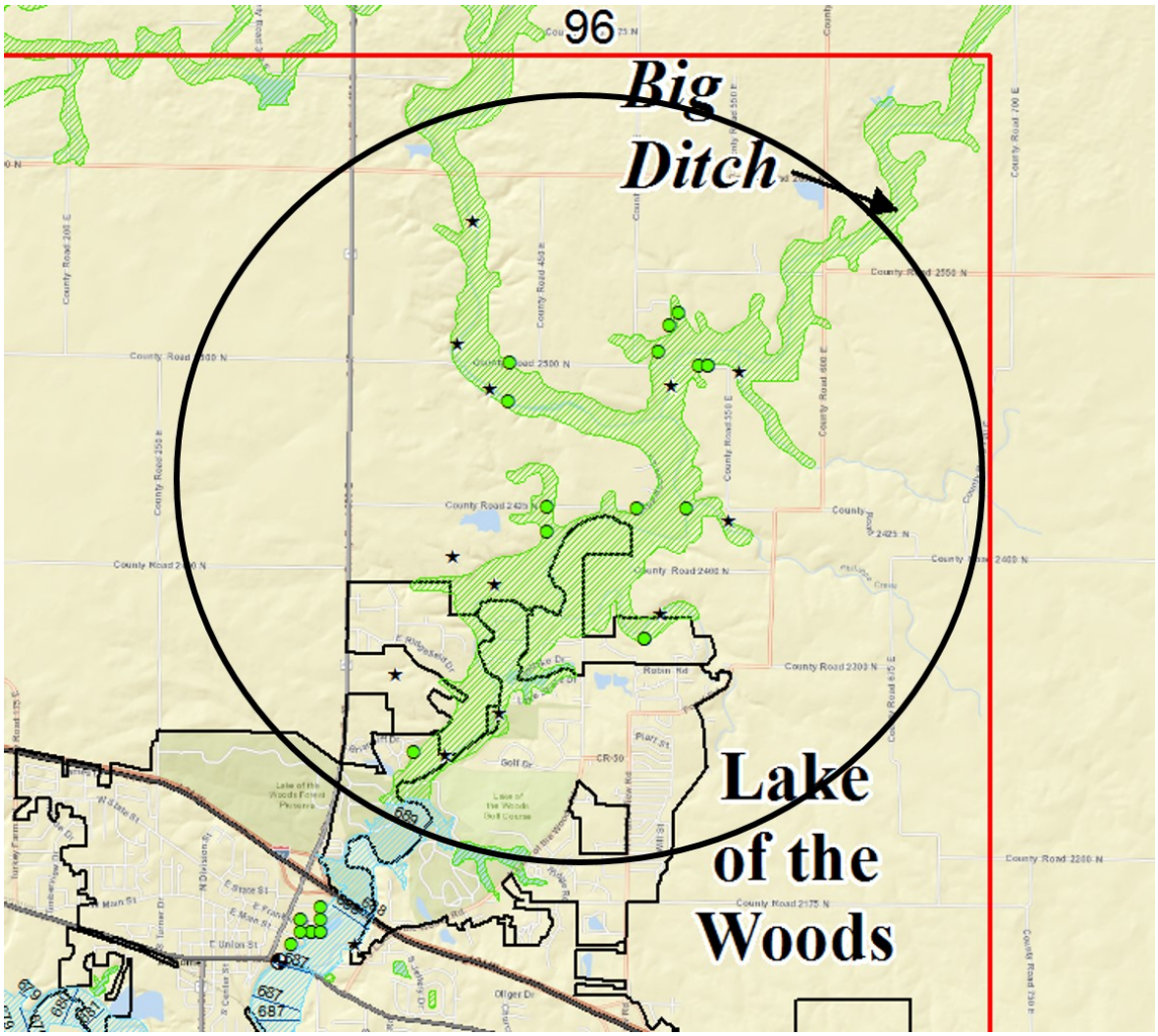
Runoff from neighboring farm fields contributes to the flooding

Sediment on the road shows runoff during flood events from adjacent farm fields

Sangamon River Flooding – Village of Mahomet, Newcomb Township, Champaign County

The Sangamon River floods several areas experiencing very rapid development north of the Lake of the Woods in Mahomet. The Sangamon River is a detailed study through the Lake of the Woods, but is a Zone A river north of the Lake of the Woods and classified as unknown within CNMS. Multiple Letters of Map Change (LOMC) have been issued in this area to accurately represent areas prone to flooding.

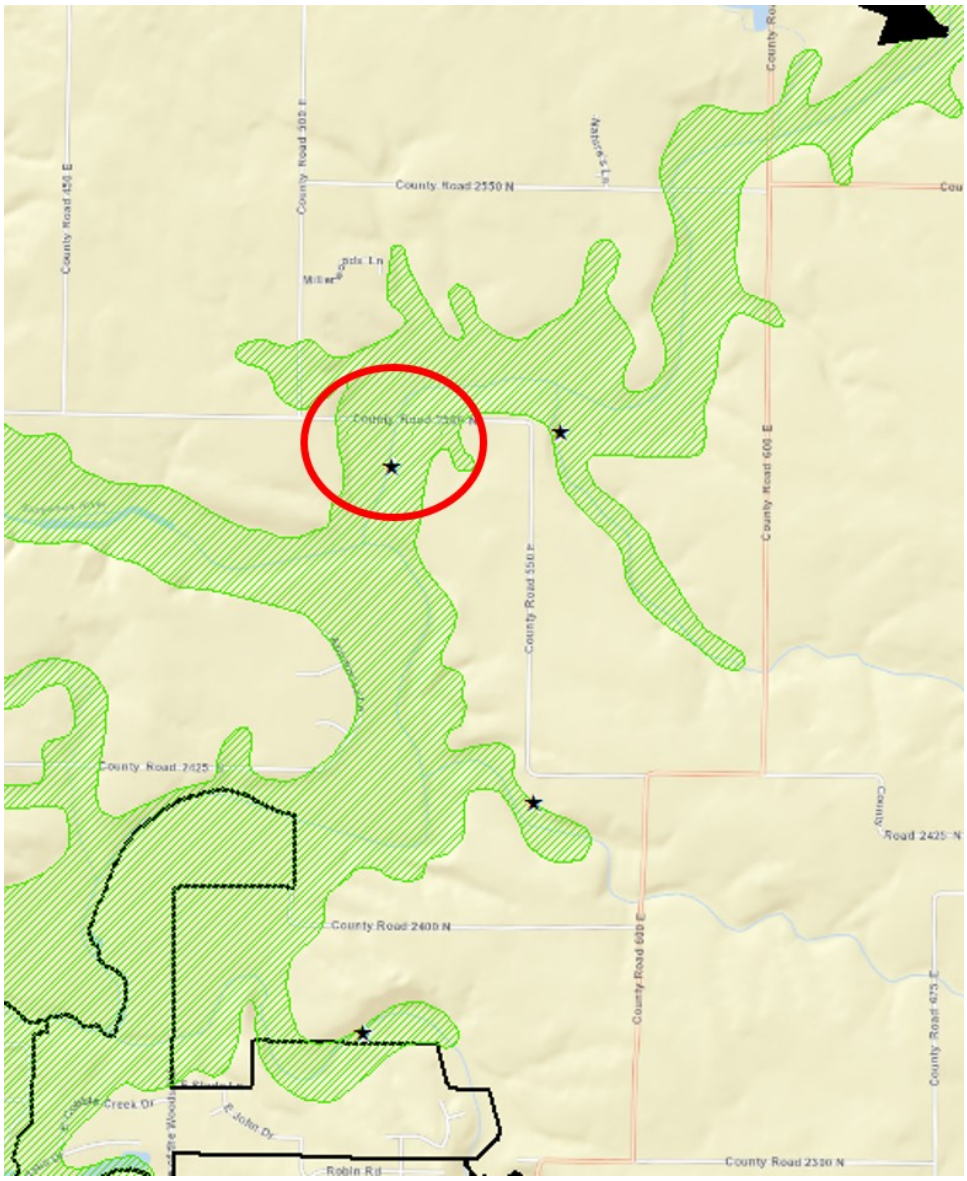
A new study should be performed on the Sangamon River and Big Ditch north of the Lake of the Woods to determine flooding boundaries and mitigate current and future flooding problems in the area.



The green hatch indicates a Zone A studied stream (blue hatch indicates a detailed study). Green circles show areas where LOMCs have been issued.

Another flooding issue occurs on County Road 2500 N (CR2500N) which is north of the Village of Mahomet and Lake of the Woods. CR2500N crosses Big Ditch directly upstream of Big Ditch's confluence with the Sangamon River. During flood events CR2500N regularly floods and overtops, indicating that the bridge was built too low for the flood conditions regularly occurring on Big Ditch. Big Ditch is a Zone A stream and is classified as unknown within CNMS.

To remedy the overtopping issue, a new study is necessary to resize the bridge opening. A larger bridge opening might mitigate the overtopping, flooding issue at this location.



County Road 2500 N Flood Risk Area

V. Appendices and Bibliography

Appendix A: Pre-Discovery Meeting Contacts & Materials
Appendix B: Stakeholder Contact Information & Meeting Invitations
Appendix C: Discovery Meeting Attendance & Handouts
Appendix D: Discovery Meeting Summary & Comments
Appendix E: Discovery Maps
Appendix F: Discovery Meeting Participant Feedback
Appendix G: Comprehensive List of Study Needs
Appendix H: Action Discovery Pre-Meeting Materials
Appendix I: Action Discovery Meeting Handouts & Presentations
Appendix J: Action Discovery Meeting Attendance, Updated Comments & Mitigation Action Forms
Appendix K: Action Discovery Maps

Bibliography

Champaign County Regional Planning Commission. January 15, 2010. *Champaign County Multi-Jurisdictional Natural Hazard Mitigation Plan.* Available from: http://www.illinois.gov/iema/Mitigation/documents/CountyPlans/plan_ChampaignCounty.pdf

Federal Emergency Management Agency (FEMA). *Community Information System.* [Cited November 26, 2014] Available from: https://isource.fema.gov/cis/loginpage.do

Illinois Department of Natural Resources (IDNR), Office of Scientific Research and Analysis, Illinois State Water Survey (ISWS). *Upper Sangamon River Area Assessment.* Champaign, Illinois: 1999.

Illinois Emergency Management Agency (IEMA). May 1, 2014. *State of Illinois DMA2K Planning Status Expirations*.

Illinois State Geological Survey (ISGS), University of Illinois at Urbana-Champaign. 2014. *LiDAR Status for Illinois.* [Cited October 29, 2014] Available from: http://www.isgs.illinois.edu/nsdihome/webdocs/ilhmp/images/status.pdf

Macon County Emergency Management Agency. March 14, 2014. *Macon County Natural Hazards Mitigation Plan.* [Cited December 5, 2014]. Available from: http://www.maconcountyema.org/Mitigation.html

The Polis Center. Southern Illinois University. February 14, 2013. *Piatt County Multi-Hazard Mitigation Plan.* Available from: http://www.illinois.gov/iema/Mitigation/documents/CountyPlans/plan_PiattCounty.pdf

U.S. Census Bureau, U.S. Department of Commerce. *State and County QuickFacts.* [Cited November 20, 2014]. Available from: http://quickfacts.census.gov/qfd/states/17000.html