

# Discovery Report

FEMA Region V

Upper Great Miami Watershed, Ohio

HUC 05080001



**FEMA**

Prepared by



## Project Area Community List

Community Name			
Ohio			
Anna, Village of	39X004	Minister, Village of	39X082
Ansonia, Village of	390138	Montgomery County	390775
Arcanum, Village of	390684	Mutual, Village of	390794
Auglaize County	390761	New Carlisle, City of	390062
Beavercreek, City of	390876	New Madison, Village of	390140
Belle Center, Village of	390339	North Hampton, Village of	390679
Bellefontaine, City of	390430	North Star, Village of	39X096
Botkins, Village of	390504	Osgood, Village of	390141
Bradford, Village of	390899	Palestine, Village of	39X101
Casstown, Village of	39X021	Phillipsburg, Village of	395434
Catawba, Village of	39X022	Piqua, City of	390400
Champaign County	390055	Pitsburg, Village of	39X104
Christiansburg, Village of	390056	Pleasant Hill, Village of	39X106
Clark County	390732	Port Jefferson, Village of	390506
Clayton, City of	390821	Potsdam, Village of	39X109
Covington, Village of	390399	Quincy, Village of	390854
Darke County	390137	Riverside, City of	390416
Dayton, City of	390409	Rosburg, Village of	39X116
De Graff, Village of	390609	Rushsylvania, Village of	39X117
Donnellsville, Village of	390061	Russells Point, Village of	390342
Englewood, City of	390828	Russia, Village of	390880
Enon, Village of	390795	Shelby County	390503
Fairborn, City of	390195	Sidney, City of	390507
Fletcher, Village of	390900	South Vienna, Village of	39X126
Fort Loramie, Village of	390830	Springfield, City of	390063
Gettysburg, Village of	390686	St. Paris, Village of	390059
Greene County	390193	Tipp City, City of	390401
Greenville, City of	390139	Tremont City, Village of	390064
Hardin County	390250	Trotwood, City of	390417

Huber Heights, City of	390884	Troy, City of	390402
Huntsville, Village of	39X056	Urbana, City of	390060
Jackson Center, Village of	390505	Valley Hi, Village of	39X138
Kettlersville, Village of	39X059	Vandalia, City of	390418
Lakeview, Village of	390341	Versailles, Village of	390142
Laura, Village of	390835	Wayne Lakes, Village of	390904
Lawrenceville, Village of	39X062	Waynesfield, Village of	39X142
Lockington, Village of	39X067	West Liberty, Village of	390343
Logan County	390772	West Milton, Village of	390403
Ludlow Falls, Village of	390838	Yorkshire, Village of	39X155
Mercer County	390392	Zanesfield, Village of	390345
Miami County	390398		
<b>Indiana</b>			
Randolph County	180429	Union City, Village of	180219

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## I. **Watershed Description**

The Upper Great Miami River Watershed is located in southwestern Ohio, with a drainage area of 2,513 square miles. The 105 mile-long Great Miami River flows into the Ohio River just east of the City of Cincinnati. The principal tributaries to the Great Miami are Mad River, Turtle Creek, and Stillwater River. The headwaters originate in northwestern Logan County and flow in a southwesterly direction through Shelby, Miami and Montgomery Counties. The watershed also drains the majority of Champaign and Darke Counties, along with a small portion of Greene County. The limits of the Discovery project area are presented in Figure 1. Table 1 includes the National Flood Insurance Program (NFIP) participation status of each community within the Upper Great Miami Watershed.

# Discovery Map: Upper Great Miami Watershed

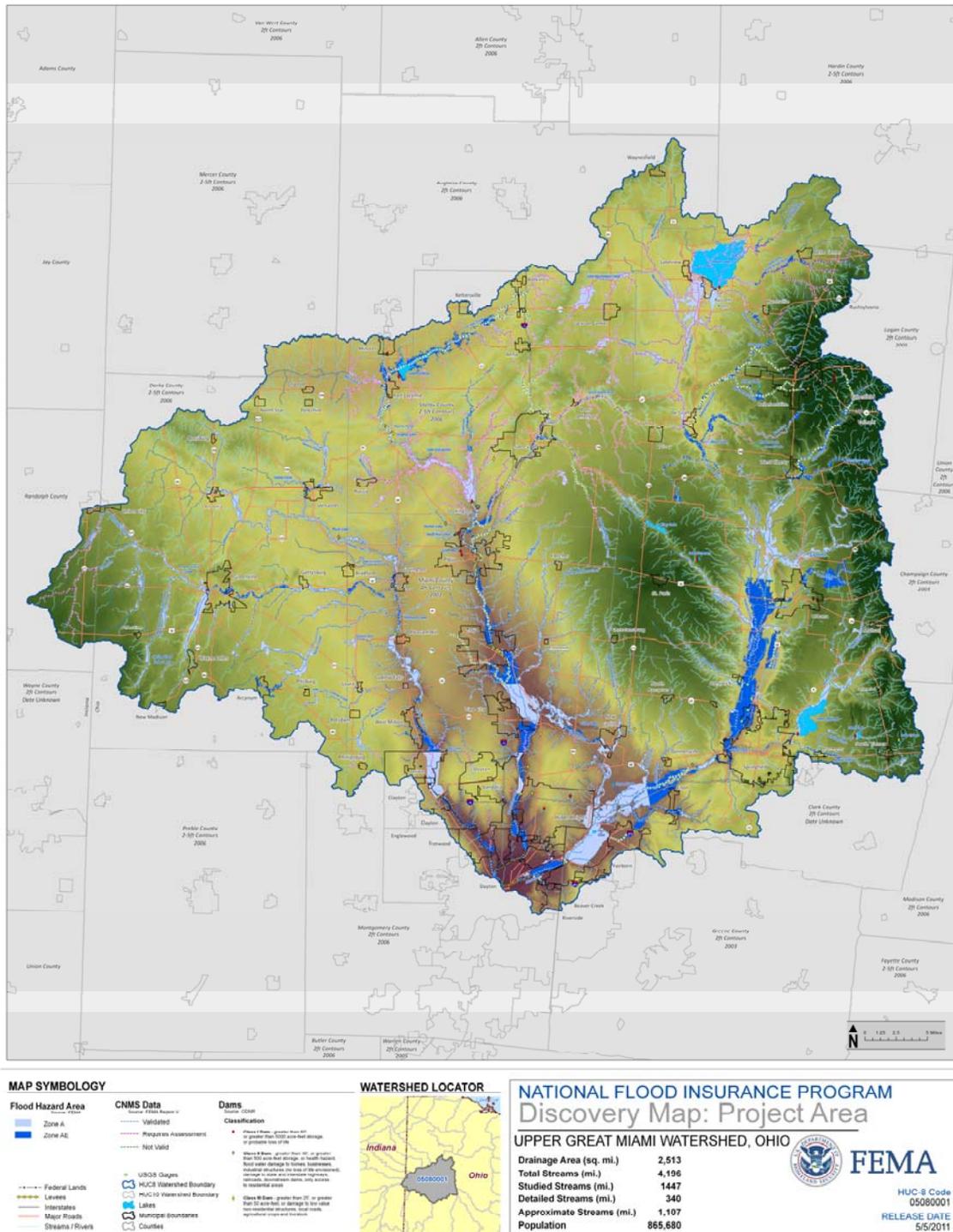


Figure 1. Project Area Map

*Table 1. NFIP Participation Status*

County	Community	Participating	County	Community	Participating
Auglaize, OH	Auglaize County	Y	Logan, OH	Belle Center	N
	Minster	N		Bellefontaine	Y
	Waynesfield	N		De Graff	Y
Champaign, OH	Champaign County	Y		Huntsville	N
	Christiansburg	Y		Lakeview	Y
	Mutual	Y		Logan County	Y
	St. Paris	Y		Quincy	N
	Urbana	Y		Rushsylvania	N
Clark, OH	Catawba	N		Russells Point	Y
	Clark County	Y		Valley Hi	N
	Donnelsville	N	West Liberty	N	
	Enon	Y	Zanesfield	Y	
	Lawrenceville	N	Mercer, OH	Mercer County	Y
	New Carlisle	Y	Miami, OH	Bradford	N
	North Hampton	Y		Casstown	N
	South Vienna	N		Covington	Y
	Springfield	Y		Fletcher	Y
	Tremont City	Y		Laura	Y
Darke, OH	Ansonia	Y		Ludlow Falls	Y
	Arcanum	Y		Miami County	Y
	Darke County	Y		Piqua	Y
	Gettysburg	Y		Pleasant Hill	N
	Greenville	Y		Potsdam	N
	New Madison	N	Tipp City	Y	
	North Star	N	Troy	Y	
	Osgood	N	West Milton	Y	
	Palestine	N	Montgomery, OH	Clayton	Y
	Pitsburg	N		Dayton	Y
	Rosburg	N		Englewood	Y
	Union City	Y		Huber Heights	Y
	Versailles	Y		Montgomery County	Y
Wayne Lakes	N	Phillipsburg		N	
Yorkshire	N	Riverside		Y	
Greene, OH	Beavercreek	Y		Trotwood	Y
	Fairborn	Y	Vandalia	Y	
	Greene County	Y			
	Huber Heights	Y			

***Table 1. NFIP Participation Status (continued)***

County	Community	Participating
Shelby, OH	Anna	N
	Botkins	Y
	Fort Loramie	N
	Jackson Center	Y
	Kettlersville	N
	Lockington	N
	Port Jefferson	Y
	Russia	Y
	Shelby County	Y
	Sidney	Y
Randolph, IN	Randolph County	Y
	Union City	Y

## II. Project Description and Methodology

Discovery is the process of data collection, including information exchange between all governmental levels of stakeholders, spatial data presentation, and cooperative discussion with stakeholders to better understand the area, decide whether a flood risk project is appropriate, and if so, to collaborate on the project planning in detail. At this time, Discovery processes and requirements are still being defined; however, draft guidance is available from the draft *Appendix I – Discovery (fall 2010)*, the draft *Meetings Guidance for FEMA Personnel (October 2010)* and the *FY11 Discovery, Statement of Priorities (January 2011)*. In addition, there are several draft tools and templates at various stages of completion that were used to support the effort.

Region V initiated a Discovery project in February 2011 for the Upper Great Miami Watershed. The Discovery process involved coordination with watershed stakeholders, data collection and analysis, a meeting with stakeholders in the watershed, and development of recommendations for Risk MAP projects based on an analysis of data and information gathered throughout the process.

The initial phase in the Discovery process was establishing a Project Team made up of local, state, and federal agencies. The Project Team for the Upper Great Miami Watershed included representatives from:

- FEMA Region V, Risk Analysis Branch
- FEMA Region V, Floodplain Management and Insurance Branch
- FEMA Region V, Hazard Mitigation Assistance Branch
- Ohio Department of Natural Resources (ODNR)
- Ohio Emergency Management Agency (OEMA)
- STARR

Project Team contact information are provided in Appendix A. The Project Team worked together to compile the stakeholder list for the Upper Great Miami watershed. Discovery Meeting invitations and stakeholder contact list are presented in Appendix B.

STARR coordinated with community officials and other watershed stakeholders through written invitations, phone calls and follow-up emails. The coordination included giving community officials information about the Discovery process. Communities were asked to identify “Areas of Concern” which could be addressed during the Discovery Meeting.

The second phase of the Discovery Project was the collection of relevant tabular and spatial data for all the communities within the watershed. The data was collected through online resources, Federal and State sources, and interviews with cooperating communities. The collected data was used to evaluate both previous and current flooding concerns, while

determining the vital areas requiring mapping needs. Section III., Data Analysis, provides a more in-depth look at the collected data.

The third phase was to hold watershed-wide Discovery Meetings and facilitate discussion and data analysis of study needs, mitigation project needs, desired compliance support, and local flood risk awareness efforts. Two (2) watershed-wide Discovery Meetings were held on May 5, 2011 in Sidney, Ohio and Troy, Ohio. The discussion was stimulated using the Discovery Geodatabase display of relevant data. Attendees, including all affected communities and selected other stakeholders, cooperatively identified possible solutions for the Areas and Points of Concern shown on the Discovery Meeting Maps. Solutions included recommendations of floodplain studies, mitigation projects, compliance issues, and ideas on how to improve the local flood risk communication programs.

Copies of the Discovery Meeting Presentations, Sign in sheets, Handouts, Meeting Notes and Meeting Feedback Forms are presented in Appendices, D, E, F and G, respectively.

The fourth phase of the Discovery effort involved an analysis of the data and information collected and discussed at the meeting, and recommendations as to the future relationship and activities between FEMA and the watershed communities. The Final Discovery Map, presented in Appendix H, indicates desired study areas and mitigation project locations, and the Discovery Report documents the results of data collection and conversation.

### **III. Data Analysis**

Discovery data collection entailed a massive collection of tabular and spatial data for all stakeholder communities from Federal, State and Local sources. A list of the data collected, the deliverable or product in which the data are included, and the source of the data is presented in Table 2. In addition, Data Analysis is divided between two sections: one section listing the data that can be used for Risk MAP products (regulatory and non-regulatory) and, one section listing the other data and information that helped the Project Team to form a more holistic understanding of this watershed.

**Table 2. Data Collection for Upper Great Miami Watershed**

<b>Data Types</b>	<b>Deliverable/ Product</b>	<b>Source</b>
<b>Insurance Policies</b>	Community Fact Sheet	Community Information System (CIS)
<b>Mitigation Plans Status</b>	Community Fact Sheet	FEMA Regional Office, OEMA
<b>Mitigation Projects</b>	Community Fact Sheet	Data.gov: FEMA Hazard Mitigation Program Summary, OEMA
<b>Other Hazard Plans</b>	Community Fact Sheet	Local websites, Community Contact, OEMA
<b>Repetitive Loss</b>	Community Fact Sheet	Community Information System (CIS), OEMA
<b>Zone B, C, and X Claims</b>	Community Fact Sheet	Community Information System (CIS)
<b>Letter of Map Change (LOMCs)</b>	Community Fact Sheet (known clusters on Discovery Map)	Community Information System (CIS), Community Contact
<b>Declared Disasters</b>	Community Fact Sheets	Data.gov: FEMA Disaster Declarations Summary
<b>Hazards</b>	Community Fact Sheets	Community Information System (CIS)
<b>Past flood claims and repetitive loss properties</b>	Community Fact Sheet	FEMA R5 and/or ODNR
<b>HUC-8 Watershed</b>	Discovery Map	USGS National Hydrography Dataset (NHD)
<b>HUC-12 Watersheds</b>	Discovery Map	National Resource Conservation Service (NRCS)
<b>Jurisdictional Boundaries</b>	Discovery Map	FEMA and ODNR
<b>Tribal land boundaries</b>	Discovery Map	US Census Bureau and/or USGS National Atlas
<b>State lands</b>	Discovery Map	Ohio Department of Natural Resources (ODNR)
<b>Federal lands</b>	Discovery Map	USGS National Atlas
<b>Transportation Major and Minor</b>	Discovery Map	Ohio's Location Based Response System (LBRS) and FEMA
<b>Stream lines</b>	Discovery Map	National Hydrography Dataset (NHD) and FEMA
<b>Protected Areas (USFWS)</b>	Discovery Map	U.S. Fish and Wildlife Service (USFWS)
<b>Study Needs</b>	Discovery Map	Coordinated Needs Management System (CNMS)

**Table 2. Data Collection for Upper Great Miami Watershed**

<b>Data Types</b>	<b>Deliverable/ Product</b>	<b>Source</b>
<b>Topographic data</b>	Discovery Map	Ohio Statewide Imagery Program (OSIP)
<b>HAZUS - Average Annualized Loss (AAL)</b>	Discovery Map	STARR
<b>Community or Tribal risk assessment data</b>	Discovery Map	HAZUS
<b>Local mitigation plans</b>	Discovery Map	OEMA
<b>State mitigation plans</b>	Discovery Map	ODPS - Ohio Emergency Management Agency (OEMA)
<b>National and Regional flood control structures</b>	Discovery Map	USACE
<b>Regional flood control structures</b>	Discovery Map	Ohio Department of Natural Resources (ODNR)
<b>Stream Gages</b>	Discovery Map	U.S. Geological Survey (USGS)
<b>Flooded Structures</b>	Discovery Map	Ohio Department of Natural Resources (ODNR)
<b>Effective study data</b>	Discovery Map	FEMA's Regional Flood Hazard Layer (RFHL)
<b>Orthophotography</b>	Discovery Map	Ohio Statewide Imagery Program (OSIP)
<b>Contacts</b>	Excel spreadsheet	Local websites, State/FEMA updates

**i. Data that can be used for Flood Risk Products**

**Topographic and Imagery Data**

As shown on the Final Discovery Map, LiDAR elevation data and digital orthophotography is available for the project area provided by the Ohio Geographically Referenced Information Program (OGRIP), as part of the Ohio Statewide Imagery Program (OSIP). The goal of OSIP was to develop and maintain a seamless statewide base map. OSIP is an initiative partnered by several State Agencies (i.e. ODOT, ODNR) through OGRIP. Data from this project forms the foundation of the Statewide base map, and was developed primarily to support multi-use applications, including homeland security, emergency management, economic development, and the business of government. The digital orthophotography consists of MrSID Images produced at 1-foot pixel resolution at a 30:1 compression ratio. The LiDAR elevation data consists of Digital Elevation Model (DEM) raster tiles acquired to meet +/- 1-foot vertical accuracy. This is suitable for rectification of digital orthophotography and for the creation of 2- and 5-foot contours (with the addition of 3D compiled breaklines). OSIP products within the Upper Great Miami Watershed were collected during leaf-off conditions in 2007.

## USGS Gages

STARR has identified several USGS stream gages in the watershed. The locations of the gages are shown on the Discovery Map and a summary is presented in Table 3.

**Table 3. USGS Gages**

<b>Gage Number</b>	<b>Station Name and Location</b>	<b>Years of Record (Peaks)</b>
03260325	North Fork Great Miami River near Indian Lake OH	1
03260450	South Fork Great Miami River near Huntsville OH	1
03260502	Great Miami River bl Indian Lake at Russells Pt OH	1
03260700	Bokengehalas Creek near De Graff OH	35
03260706	Bokengehalas Creek at De Graff OH	18
03260800	Stony Creek near De Graff OH	18
03261500	Great Miami River at Sidney OH	97
03261950	Loramie Creek near Newport OH	45
03262000	Loramie Creek at Lockington OH	95
03262700	Great Miami River at Troy OH	48
03262750	Millers Ditch at Tipp City OH	17
03263000	Great Miami River at Taylorsville OH	93
03263100	Poplar Creek near Vandalia OH	31
03263168	Stillwater River near Ansonia OH	8
03263700	Bridge Creek near Greenville OH	31
03264000	Greenville Creek near Bradford OH	79
03265000	Stillwater River at Pleasant Hill OH	94
03265100	Hog Run tributary at Laura OH	28
03266000	Stillwater River at Englewood OH	85
03266500	Mad River at Zanesfield OH	33
03266560	Mad River at West Liberty OH - 03266560	14
03267000	Mad River near Urbana OH	76
03267900	Mad River at St Paris Pike at Eagle City OH	42
03267950	Buck Creek near New Moorefield OH	9
03267960	East Fork Buck Creek near New Moorefield OH	9
03268000	Buck Creek at New Moorefield OH	17
03268300	Beaver Creek at Brighton OH	19
03268500	Beaver Creek near Springfield OH	21
03269000	Buck Creek at Springfield OH	57
03269500	Mad River near Springfield OH	99
03270000	Mad River near Dayton OH	96

### **Average Annualized Loss (AAL) Data**

FEMA has conducted a Level 1 Hazus flood analysis to determine average annualized losses (AAL) for the project area. This analysis was based on USGS 30-meter DEM data and Hazus software default inventory data. The Hazus riverine hydrology analysis used default USGS regression equations to estimate the peak flows for selected return periods and the USGS topographic data to conduct normal depth calculations for flood depth grids. The loss estimation for the AAL data was then conducted to produce loss calculations at the U.S. census block level.

The AAL data is symbolized on the Discovery Map as varying levels of risk. During the Discovery meeting, the Level 1 analysis results were validated by stakeholders to identify potential sites for Refined Analyses.

## **ii. Other Data and Information**

### **Mitigation Plans/Status, Mitigation Projects**

Hazard Mitigation Plans (HMPs) are prepared to assist communities to reduce their risk to natural hazard events. The plans are used to develop strategies for risk reduction and to serve as a guide for all mitigation activities in the given county or community. The available HMPs obtained and reviewed for this Discovery Project are presented in Table 4.

**Table 4. Hazard Mitigation Plan Status**

<b>County/Community</b>	<b>Hazus</b>	<b>Hazard Mitigation Plan</b>	<b>Issue Date</b>	<b>Expiration Date</b>
<b>Auglaize County</b>	N	Y	2008	2013
<b>Champaign County</b>	N	Y	2006	2012
<b>Clark County</b>	N	Y	2006	2013
<b>Darke County</b>	N	Y	2006	2011
<b>Greene County</b>	N	Y	2007	2012
<b>Hardin County</b>	N	Y	2006	2011
<b>Logan County</b>	N	Y	2005	2010
<b>Mercer County</b>	N	Y	2006	2011
<b>Miami County</b>	Y	Y	2006	2011
<b>Montgomery County</b>	N	Y	2007	2012
<b>Shelby County</b>	N	Y	2006	2011

Critical facilities are the facilities that can impact the delivery of vital services, cause greater damages to other sectors of a community, or put special populations at risk. The assessment of the flood risk posed to critical facilities within the watershed is an important aspect of the HMPs. Critical facilities that are located within the 1-percent-annual-chance floodplain were quantified and identified as at-risk structures. The exact number of critical facilities that are considered at-risk is not quantifiable due to the limited detail presented in

the HMPs. The number of critical facilities estimated to be within the 1-percent-annual-chance floodplain was determined by overlaying Hazard Maps included in the HMP's with the latest flood hazard data. However, the risk of flood damage is limited by the detail and accuracy of the most recent flood map. An estimated total of 48 critical facilities within the watershed are considered at-risk and should be identified as an Area of Mitigation Interest.

A repetitive loss structure is a term associated with the National Flood Insurance Program (NFIP). For Flood Mitigation Assistance (FMA) program purposes, a repetitive loss structure is one that is covered by a flood insurance contract under the NFIP, that has suffered flood damage on two or more occasions over a 10-year period, ending on the date when a second claim is made, in which the cost to repair the flood damage, on average, equals or exceeds 25% of the market-value of the structure at the time of each flood loss event. In terms of the Community Rating System (CRS) of the NFIP, a repetitive loss property is any property, which the NFIP has paid two or more flood claims of \$1,000 or more, in any given 10-year period since 1978. A repetitive loss structure is important to the NFIP, since structures that flood frequently put a strain on the flood insurance fund. It should also be important to a community because of the disruption and threat to residents' lives by the continual flooding.

Specific details regarding repetitive loss structures within the floodplain were not made available in the available HMPs. The locations of repetitive loss structures presented on the Discovery Map were determined by rectifying the HMP's Hazard Maps to the Discovery Map basemap data. The exact locations and numbers of repetitive loss structures have been summarized with caution due to the lack of detail in the HMPs and Hazard Maps. Areas that have suffered multiple repetitive losses are some of the most important areas of mitigation interest. The total number of repetitive loss structures within the watershed is 58.

Numerous locations of roads overtopping during flood events were identified during the data collection and Discovery Meeting process.

Numerous dams exist within the watershed, but are not mentioned in the HMPs as flood control structures. According to the ODNr database, seventeen (17) Class I dams are located within the watershed and owned/operated by state or federal agencies.

The overall goals of the reviewed HMP's were found to be consistent; however, specific methods for implementation of these goals and locations of specific projects were not readily available. These goals include:

- Educate the citizens of each county to increase awareness of flooding and where to seek safety during flood events
- Provide adequate shelters where citizens can seek safety from severe weather and flooding
- Improve the warning systems and radio communications throughout the county

- Expedite the clean up process through coordination and equipment acquisition
- Update countywide NFIP maps
- Purchase or flood proof repetitive loss structures
- Develop map of infrastructure concerns

Some of the county's/community's HMPs included the locations and number of repetitive loss structures while other plans left this information out. This inconsistency in information holds true with the location and number of critical facilities found within the 1-percent-annual-chance floodplain.

An example of a recent mitigation project that has occurred within the Upper Great Miami Watershed was an acquisition of residential properties along the Russels Point spillway along Indian Lake. These properties were located within the 1-percent-annual-chance floodplain and had sustained substantial damage during a number of flood events. The project was funded by several grants from the Hazard Mitigation Grant Program for the acquisition and removal of structures in the problem area.

### **Coordinated Needs Management Strategy (CNMS) and NFIP Mapping Study Needs**

Analysis of the CNMS data for the Upper Great Miami Watershed is complete. Analyzed studies have been identified as "VALID" or "INVALID". The current CNMS geospatial data is presented on the Final Discover Map.

### **Socio-Economic Analysis**

Development within the Upper Great Miami Watershed ranges from very developed to rural. The majority of the land within the watershed west of the Upper Great Miami is developed, especially near its confluence with the Ohio River, while the eastern portion of the watershed is still relatively undeveloped with narrow steep valleys. Approximately 1.7 million residents live within the Upper Great Miami Watershed (2010 Census). The median age in the watershed is in the mid 30's, and around 10% of the population over 65 years old. Between 2-5% are non-English speakers, and less than 1% are Native American. Approximately 85% of the population graduated high school, and about 10% have a college degree. Around 60% of residents over the age of 16 that desired employment were working, with a median income between \$27,000 and \$34,000 annually. The top three industries employing residents include:

- Manufacturing
- Educational, health, and social services
- Retail trade.

### **Community Rating System (CRS)**

There are no communities in the Upper Great Miami River Watershed that participate in the CRS program.

### Levees

Within the Upper Great Miami Watershed, several levees exist. The majority of the levees in the watershed are along the Great Miami River existing in the Dayton, Piqua, Troy, Tipp City, Vandalia and Huber Heights municipalities. Other levee systems include the Mad River and the Stillwater River systems in the City of Dayton.

### Floodplain Management/CAVs

Based on information provided by ODNR, the following communities have open CAV's: Village of Arcanum, City of Beavercreek, City of Bellefontaine, Greene County, Logan County, Village of Russells Point, City of Sidney, and City of Springfield.

### Regulatory Mapping

A number of communities within the Upper Great Miami Watershed have had recent countywide map updates as part of FEMA's Map Modernization Program. The effective dates of the most recent county-wide projects are presented on the Discovery Map and below in Table 5. The effective data is a combination of both detailed and approximate analysis with varying vintage dates.

**Table 5. Map Modernization Activity**

<b>County</b>	<b>Status</b>	<b>Effective Date</b>
<b>Auglaize, OH</b>	Unmodernized	N/A
<b>Champaign, OH</b>	Effective	11/18/2009
<b>Clark, OH</b>	Effective	2/17/2010
<b>Darke, OH</b>	LFD 1/18/2011	N/A
<b>Greene, OH</b>	Effective	3/17/2011
<b>Hardin, OH</b>	Unmodernized	N/A
<b>Logan, OH</b>	Unmodernized	N/A
<b>Mercer, OH</b>	Unmodernized	N/A
<b>Miami, OH</b>	LFD 2/2/2011	N/A
<b>Montgomery, OH</b>	Effective	1/6/2005
<b>Randolph, IN</b>	Preliminary	N/A
<b>Shelby, OH</b>	Unmodernized	N/A

### Community Fact Sheets

To help guide the data analysis process, a Fact Sheet was developed for each community within the watershed (Appendix H). Each Fact Sheet summarizes the demographic, social, and industrial characteristics and flood-study information for each community.

## IV. Risk MAP Needs

The results of the data collection and analysis were thoroughly discussed at the Discovery Meeting. The following sections include issues and situations that exist in the Upper Great Miami Watershed communities that can be considered Risk MAP Needs, to be addressed with Risk MAP projects. Details and background on all issues can be found in the interview notes, meeting notes, and other files included in the appendices.

### i. Floodplain Studies

A number of the counties located in the Upper Great Miami Watershed have undergone recent countywide DFIRM projects; however, not all of these projects included new Zone A studies.

As shown on the Final Discovery Map, recent LiDAR and imagery data meeting FEMA’s Guidelines and Specifications have been developed for the entire Discovery Project Area.

As shown on the Final Discovery Map, numerous study reaches have been classified as “INVALID” during the CNMS process.

At the Discovery Meeting, several areas were identified by community officials as needing an updated detailed or approximate study.

Based on the results of the Stakeholder Coordination, Data Analysis and Discovery Meeting, proposed Study Areas in the Upper Great Miami have been identified in Table 6.

**Table 6. Mapping Needs**

FLOODING SOURCE	STUDY LENGTH (miles)	STUDY TYPE
Bokengehalas Creek	13.7	DETAILED
Blue Jacket Creek	7.9	DETAILED
Great Miami River	27.9	DETAILED
Great Miami River	19.2	APPROXIMATE
Greenville Creek	6.0	APPROXIMATE
Hebble Creek	2.8	DETAILED
Hulls Creek	4.0	DETAILED
Island No. 3 Tributary	8.0	DETAILED
Leatherwood Creek	4.6	DETAILED
Lilly Creek	1.2	DETAILED
Loramie Creek	24.5	DETAILED
Mad River	17.7	DETAILED
Mad River	10.5	UNSTUDIED

FLOODING SOURCE	STUDY LENGTH (miles)	STUDY TYPE
Mad River (Right Overbank)	2.2	DETAILED
Moore Run	3.3	DETAILED
Plum Creek	6.8	DETAILED
Possum Run	1.9	DETAILED
Rush Creek	3.4	DETAILED
South Fork Great Miami River	10.7	APPROXIMATE
Stillwater River	14.5	APPROXIMATE
Swanders Creek	1.5	DETAILED

## ii. Mitigation Projects

Loramie Creek was found to be “INVALID” in CNMS, due in part to a change in the number of hydraulic structures and differing updated and effective discharges. A number of community officials noted increased development and channel reconfiguration in multiple areas along this stream.

Several locations of overtopping roads and undersized culverts were identified by the communities.

## iii. Compliance

While several communities have open CAV’s no Risk MAP Needs regarding compliance issues were identified.

## iv. Communications

The local officials were all interested in learning more about how to provide flood risk information to residents. Community representatives indicated the need to be kept informed about the results of the Discovery process and opportunities for public input throughout the process.

## V. Close

Local officials in the communities were interested in the Discovery process and Risk MAP and open to learning more about how they can begin to develop resiliency to flood events. They identified several areas for map updates and areas in which they could use additional FEMA support. The information gathered in the Discovery process provided invaluable information for analyzing and identifying the most flood-prone and at-risk areas. Local officials will now be more aware of risks in their area, and state and federal agencies will be able to focus their resources on the most feasible projects. The local officials in the Upper Great Miami Watershed would benefit from the implementation of Risk MAP projects.

## VI. Appendix - Discovery Files

The Discovery Report appendices are stored digitally under their respective folders on the MIP at:

\\05090202\Discovery\Project\_Discovery\_Initiation\Discovery\_Report\

Appendix A - Project Team Contact Information & Meeting Minutes

Appendix B - Stakeholder Contact Information & Meeting Invitations

Appendix C - Discovery Meeting Presentations

Appendix D - Discovery Meeting Sign-In Sheets & Handouts

Appendix E - Discovery Meeting Notes & Comments

Appendix F - Discovery Meeting Participant Feedback

Appendix G - Discovery Maps

Appendix H - Community Fact Sheets