

# **Section One: Introduction**

## **Overview – Disaster Mitigation Act of 2000**

The Disaster Mitigation Act of 2000 (DMA2K) was enacted by the federal government for the purpose of reducing or eliminating the long-term risk to human life and property from natural disasters. This legislation provides local communities with the guidance necessary to appropriately assess the natural disasters impacting these communities and to establish and implement mitigation activities that will result in reducing or eliminating these risks. The Act emphasizes cooperative efforts among all public sectors including local citizens; village, city, township, and county officials; and State and federal governmental agencies. It is to this end that the Wood County Mitigation Plan for Natural Disasters is established.

## **Committee Mission**

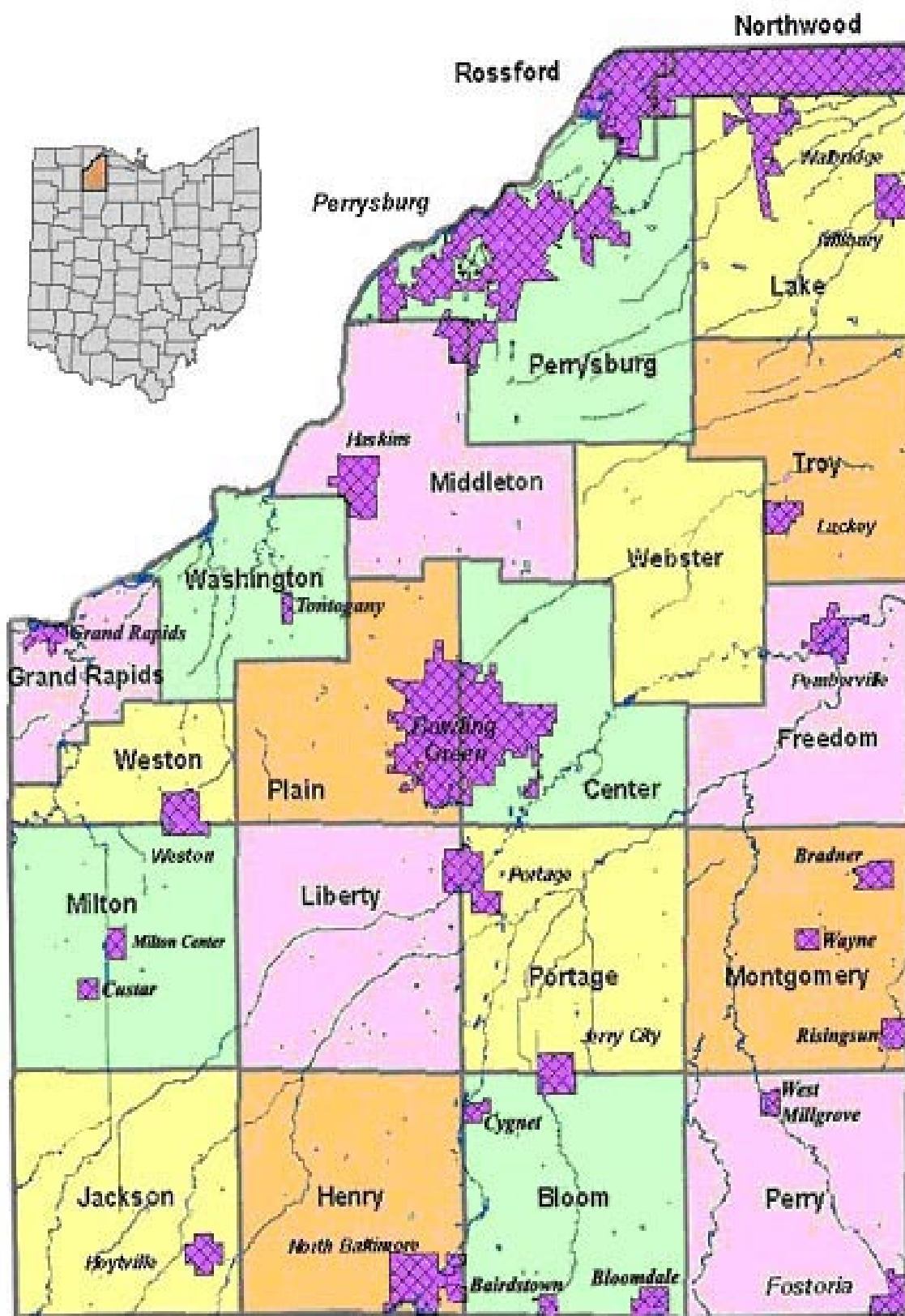
It is the mission of the Wood County Mitigation Planning Committee to develop and implement a Mitigation Plan for Wood County, Ohio that is directed specifically to natural disasters. Through cooperative efforts among those identified above, the Plan is designed to minimize the adverse effects of natural disasters on the lives and properties of citizens of Wood County.

## **Plan Design**

The Wood County Mitigation Plan for Natural Disasters is designed, through its goals and action plans, for a five-year implementation period. It is considered a multi-jurisdictional plan. Multi-jurisdictional plans address issues specific to individual incorporated areas (cities and villages) and the remaining unincorporated areas (townships). The Plan describes the methods and procedures utilized in its development; provides the results of community assessments; identifies the mitigation activities determined to be most important to the citizens of Wood County; and sets timelines for the implementation of those activities. This Plan will continue to be a working document.

## **Community Overview**

Wood County is one of 88 counties in the State of Ohio. It is located in the northwest region of the State and is comprised of approximately 600 square miles (ranked 6<sup>th</sup> in Ohio). It is bounded by six counties: Lucas on the north; Ottawa, Sandusky, and Seneca on the east; Hancock on the south; and Henry on the west. Wood County is comprised of 45 political subdivisions; four cities, 21 villages, and 19 townships. Bowling Green, the County Seat, is located centrally within the County. Wood County has a population of over 121,000 (2000 Census) which ranks 29<sup>th</sup> in Ohio. Populations within the County are concentrated in the northern section. According to the Ohio Department of Development, 77% of the land use in the County is agricultural (2000) but centers of manufacturing are dispersed throughout the County, mainly in the northern quadrant where populations are concentrated.



## **Section Two: Organization**

### **Committee Organization**

One of the most important factors in this, as well as any planning effort, is to acquire the services of qualified and committed individuals who assist in the development of a formal planning document; in this endeavor, one that considers the well-being of each citizen within the County. The Wood County Mitigation Planning Committee is comprised of such valued individuals.

Consideration for participation on the core Committee was centered upon those citizens who, because of their positions within the community, their involvement in public service activities, or because of other valued qualifications, would best provide expertise and direction to the development and implementation of a workable Mitigation Plan.

Selection of Committee members followed consultation with the Director of the Wood County Emergency Management Agency and other County officials. Primary emphasis was given to governmental leaders at all levels within the County. Representation from the Wood County Emergency Management Agency was considered paramount in forming the foundation for the remainder of the Committee. Representatives from County departments such as the Planning Commission, Economic Development, TMACOG (Toledo Metropolitan Area Council of Governments), and others were selected for their involvement in community planning. The County Auditor and County GIS (Geographical Image Systems) Coordinator were chosen for their expertise in property data. Other valuable assets to the Committee were representatives of County political subdivisions such as the Wood County Commissioners, city and village mayors, as well as township trustees. Fire departments, law enforcement agencies, industry, news media, and a number of other community leaders are participating on the core Committee. Currently, the core Mitigation Planning Committee is comprised of individuals who represent five County political subdivisions.

### **Political Subdivision Participation**

The success of any countywide mitigation planning effort is completely dependent upon the level of participation of those political entities that are benefited by the resulting plan. Consequently, a concerted effort, following the establishment of the Mitigation Planning Committee, was to elicit the support and direct involvement from the 45 political subdivisions within the County. Since the City of Fostoria is within the boundaries of three counties (Wood, Hancock, and Seneca), the City was contacted to determine the county preference for inclusion with the mitigation planning process. It was their decision to be included within the jurisdiction of Seneca County for their mitigation of natural disasters.

Levels of participation in the planning process by each County political subdivision varied throughout the stages of the mitigation planning effort. Initially, formal meetings were held with representatives of all 45 political subdivisions; one, consisting of County Township Trustees and the other with the mayors of County cities and villages. These meetings were designed to provide information on the Mitigation Act of 2000 and to describe elements of the mitigation planning process.

Subsequently, questionnaires were developed and sent to representatives from each political subdivision to assess their desired level of involvement within the planning process. Participation levels spanned from receiving Committee meeting minutes to having a formal presentation on the mitigation planning process and developing specific mitigation proposals.

Following the completion of the draft Mitigation Plan, each city and village within the County as well as the Wood County Commissioners were given the opportunity to formally adopt the Plan. Copies of formal resolutions adopting the Wood County Mitigation Plan that were passed by the relevant political subdivisions within the County are found in Appendix A.

As the planning process continues, each County political subdivision will play a valuable role in the dissemination of mitigation planning information to their respective constituents. As well, their continued involvement with mitigation initiatives is extremely important in the protection of community citizens and properties. Those efforts are described further in Section Six. Copies of the materials used during the planning process (questionnaire, meeting information, Committee meeting agenda) are provided in Appendix B.

## **Regional Acknowledgement**

The adverse effects of natural disasters are not bound by the borders of political subdivisions. Accordingly, the mitigation of natural disasters must take into consideration the impacts of natural disasters on counties adjacent to Wood. A prime example would be the sharing of a river floodplain by counties neighboring one another. Because of these circumstances, attention must be given to the potentials of joint mitigation activities that would benefit citizens that may reside in close proximity to one another, but fall under separate county jurisdictions.

To that end, the Emergency Management Agency directors from adjacent counties (Lucas, Henry, Putnam, Ottawa, Sandusky, and Seneca) were contacted to inform them of the development of Wood County's Mitigation Plan for Natural Disasters. The correspondence also expressed the Committee's willingness to assist in cooperative mitigation initiatives that might be developed with adjacent counties. The letter sent to these Directors, as well as their respective names and addresses can also be found in Appendix B. These potential initiatives are discussed further in Section Four: Goals and Activities.

## **Public Outreach**

Another exceedingly important issue relating to the development and implementation of the Wood County Mitigation Plan is the participation of County citizens in those processes. Information provided by the Planning Committee is critical in gaining the support and involvement of the citizenry in the overall planning effort. In order to be effective, the Mitigation Plan must fit the needs of the people it is charged to protect. It is important that public involvement be solicited from the early stages of plan development and continues throughout the entirety of the planning process. The Planning Committee's efforts to maximize community involvement are described in Section Six.

## **Section Three: Hazard Analysis**

### **Overview**

The Wood County Mitigation Planning Committee provides the following Hazard Analysis of natural disasters that have affected, and will continue to potentially affect, Wood County, Ohio. The purpose of this hazard analysis is to identify properties and populations within the County that are most at risk from the adverse impacts of natural disasters. To that end, the data and other information acquired during this portion of the mitigation process will be used to develop specific mitigation projects. These proposed projects, identified in a forthcoming section of the Plan, will be designed to lessen the adverse impacts of natural disasters on the citizens of Wood County. The Hazard Analysis section of the Plan has been completed in accordance with provisions of the Federal Mitigation Act of 2000.

The Hazard Analysis section includes five unique components: Hazard Identification, Profiles of Hazard Events, Community Profile, Vulnerability Analysis, and Estimated Losses.

The Hazard Identification component is designed to recognize particular types of natural disasters that have the potential of occurring within the County. Recorded incidences of past natural disasters were used to make this determination. Sources used in this identification and incorporation within the Plan are described below. The natural disasters impacting Wood County are listed specifically in this section. This section stands alone and is considered to be the foundation for the remaining components of the Hazard Analysis section. With the exception of the Vulnerability Analysis component, the data and other pertinent information for each of the remaining hazard analysis components is contained under the headings for each specific natural hazard listed.

Profiles of Hazards Events identify past incidences of natural disasters within Wood County. The information and data presented in these profiles were obtained through review of historical data from news media sources, discussions with community residents, County officials, representatives from the Ohio Emergency Management Agency, Ohio Department of Natural Resources, and the National Weather Service. Internet websites were researched as were resources through Bowling Green State University. Additional sources of data/information are identified under specific natural disasters. Data provided on the extent of damage and losses are as complete to the best of our knowledge from the research conducted on each natural disaster. Utilizing these determinations is valuable in the mitigation process by focusing mitigation efforts on particular natural disasters deemed to be more pertinent to the County.

The Community Profile component compares overall County property statistics to those within the pertinent hazard area. The County property data were obtained from the Wood County Auditor and were correlated using GIS (Geographic Informational Systems) by the Department of Geography at Bowling Green State University. Individual parcels and property asset data were used in the determination of estimated losses as opposed to structural data. Specific structural information for each parcel is available but, due to time constraints, was not incorporated within the Hazard Analysis at this time. The parcel data do, however, reflect the occupancy types of these properties. The given occupancy type would indicate the relevant populations that would be associated with particular parcels. For example, a parcel occupancy type identified as “educational” could mean that the parcel contains a school, a playground, a school parking lot, or all of the above; depending upon how the parcel was zoned. It could also reflect a vacant lot owned by an academic institution. The lack of specific structural data within the Hazard Analysis does not adversely impact mitigation planning. Future modifications of the Hazard Analysis will incorporate

specific structural data as necessary. Current and future property data, in conjunction with population considerations, will continue to be valuable in directing particular mitigation initiatives toward locations and populations determined to be more at risk.

Specific population data were also not included as a part of the Hazard Analysis. Historical documentation has indicated that injuries/deaths of Wood County citizens due to natural disasters have been minimal. Some correlations can also be made between property occupancy types and populations without providing specific numbers of individuals. Mitigation planning, however, will continue to include personal injury/death potentials as a major consideration for proposed activities/projects.

The Vulnerability Analysis component is presented within the Appendices section of the Plan in the form of aerial photos and maps. Both are provided for County areas where localized hazard events are possible (e.g. Class I dam failure, flood, and tornado). Mapping of generalized hazard events (e.g. drought and severe winter storm) is not included as a formal part of the Plan due to their potential impact over the entire County.

Overall emergency planning and response authority for all natural disasters occurring within the County are under the authority of the Wood County Emergency Management Agency (WCEMA). Emergency planning and response activities are implemented in cooperation with all relevant County political subdivisions. Procedures and other provisions of emergency planning and response to natural disasters are specified within Wood County's *Emergency Operations and All Hazards Plan*. Should the capabilities of response at the County level be exceeded, requests for assistance would be made by the WCEMA to the Ohio and/or Federal Emergency Management Agencies.

The final Hazard Analysis component, Estimated Losses, quantifies monetary damage that might be incurred to properties affected by the respective natural disaster. For the purposes of this Plan, estimations are provided on total loss of the property only. Partial damage to structures/parcels, loss of contents, and loss of function are not incorporated within the quantifications of the estimated losses. With few exceptions, all data provided in this Hazard Analysis component (numbers of parcels and financial estimates) were calculated from County parcel value data utilizing GIS as described above.

As stated in the introductory section of the Plan, Wood County is comprised of 45 political subdivisions; four cities, 21 villages, and 19 townships. Bowling Green, the County's most populous city, is the County seat and is located mid-County. An area of concentrated populations can also be found in the County's northern section; consisting of relatively adjacent communities of Perrysburg, Rossford, Northwood, and Walbridge as well as the outlying areas of their respective townships (Perrysburg and Lake). Land use within the County is primarily agricultural but centers of commercialization are dispersed throughout the County, most generally within the most populated areas identified above.

Future population growth within Wood County is expected to remain fairly constant. Current and projected tendencies are for populations to increase, mainly in suburban locations. Current population increases have essentially been due to relocations from urban areas within the County and not relocations from other states/counties. Future increases will most likely occur from urban locations as well.

Expansion of structures within 100 year floodplain areas is also expected to be minimal. Any construction in these areas must meet the provisions of County resolution (unincorporated areas) and ordinances established by political subdivisions within the County. Floodplain management planning efforts will be addressed in an upcoming section of the Plan.

The potential impact of natural disasters on students housed at Bowling Green State University continues to be realized from late August to early May. Approximately 7,000 students are housed on campus and in the surrounding vicinity during that period. These and other assumptions are, and will continue to be, a main consideration of mitigation planning.

## **Hazard Identification**

Based upon historical data and other information obtained from the aforementioned sources as well as Wood County's *Emergency Operations and All Hazards Plan*, there are a number of natural disasters that have potentials for adversely impacting Wood County. These are as follows: Class I dam failure, drought/extreme heat, earthquake, flood, hailstorm, severe winter storm, tornado, and windstorm. Individually, these natural disasters may affect the County in varying degrees of severity. As mentioned, the remaining three components of this hazard analysis will be addressed individually for each of these natural disasters.

When discussing the impacts of natural disasters on any community, one important issue lies in the vulnerability of critical facilities and the likelihood of their having a high potential of being severely impacted by natural disasters. Critical facilities are considered those that provide essential services to the community that include hospitals, schools, fire departments, law enforcement offices, and nursing homes (see Appendix C, Fig. 1). Impacts of individual natural disasters on critical facilities will be addressed within the respective hazard description. Protection of critical facilities is identified as a goal of the Plan. Mitigation initiatives associated with specific critical facilities are provided in Section Five.

### **Class I Dams**

According to the Ohio Department of Natural Resources, Class I dams are selected on the basis of three criteria: height (greater than 60 feet), storage volume (greater than 5,000 acre-feet, and potential downstream hazard (probable loss of life, serious hazard to health, and structural damage to high value property). Only one of these criteria needs to be met for a dam to be classified as Class I. The Ohio Department of Natural Resources has identified four Class I dams for Wood County (see Appendix C, Fig.2).

One Class I dam is an earthfill up-ground reservoir that is adjacent to the Bowling Green Water Treatment Facility in Middleton Township. It serves as the primary water supply for the city of Bowling Green, Ohio and other County villages of Grand Rapids, Weston, Rudolph, Portage, and Haskins. The reservoir was constructed in 1989 and is capable of containing approximately 170M gallons.

A second Class I dam is Providence Dam. Providence Dam is a concrete channel dam utilized within the Maumee River. The dam located in Grand Rapids Township and it serves to assist in public recreation for that portion of the Maumee River. Construction of Providence Dam was completed in 1907.

The third and fourth Class I dams in Wood County are located adjacent to one another; off stream of the Rocky Ford Creek in Henry Township near the Village of North Baltimore. They are both earthfill up-ground reservoirs that are utilized as the public water supply for the Village as well as providing recreation for area residents. The smaller of the two reservoirs was constructed in 1969 and contains approximately 100M gallons. The adjacent reservoir was constructed in 2001 and is capable of containing 257M gallons.

## **Profile of Hazard Event – Class I Dams**

There have been no failures of any of the aforementioned Class I dams in Wood County since they were constructed. The probability of a Class I dam breach would be considered as low.

## **Community Profile – Class I Dams**

Flooding of nearby homes and other occupied structures would be considered a likely outcome should a breach of a Class I dam occur. Roadways within close proximity to the dams and some adjacent agricultural property may also be affected. With the exception of the Bowling Green Water Treatment Facility near the Middleton Township reservoir, there are no critical facilities located within the areas of vulnerability established for the Class I dams.

The tables below describe relevant assets within Wood County and within the specific hazard areas. Within the respective hazard areas, the percentages of parcels and their associated values are negligible in comparison with the entire County area.

Visualizations of the total breaching of the Middleton Township Reservoir and Reservoir #2 in North Baltimore are depicted in Appendix C (Figs, 3 and 4). Both are provided with vulnerability zones; 500/1,000 foot zones for the Middleton Township Reservoir and a 500 foot zone around Reservoir #2 in North Baltimore. These zones project impacted areas should releases of varying degrees occur. Due to the minimal potential of any Class I dam breach, no additional release scenarios are provided for those locations. The most current photo of the two adjacent up-ground reservoirs in North Baltimore is provided in Appendix C, Figure 5.

Based on research conducted of Providence Dam (Grand Rapids), a breach of this dam would not adversely impact properties within the area beyond any projections due to 100-year flooding of the Maumee River. 100-year flood data for the Maumee River are provided under that particular natural disaster. Consequently, no additional data are furnished here for this Class I dam location.

## **Community Profile – Middleton Township**

| Type of Parcel<br>(Occupancy Class) | Number of Parcels |                  |                  | Value of Parcels  |                   |                  |
|-------------------------------------|-------------------|------------------|------------------|-------------------|-------------------|------------------|
|                                     | # in Wood County  | # in Hazard Area | % in Hazard Area | \$ in Wood County | \$ in Hazard Area | % in Hazard Area |
| Residential                         | 47,500            | 9                | Negligible       | \$4,178,787,230   | \$1,653,222       | Negligible       |
| Government                          | 5,346             | 1                | Negligible       | \$800,837,900     | \$4,312,800       | Negligible       |
| <b>Total</b>                        | 52,846            | 10               | Negligible       | \$4,979,625,130   | \$5,966,022       | Negligible       |

## **Community Profile – North Baltimore**

| Type of Parcel<br>(Occupancy Class) | Number of Parcels |                  |                  | Value of Parcels  |                   |                  |
|-------------------------------------|-------------------|------------------|------------------|-------------------|-------------------|------------------|
|                                     | # in Wood County  | # in Hazard Area | % in Hazard Area | \$ in Wood County | \$ in Hazard Area | % in Hazard Area |
| Residential                         | 47,500            | 14               | Negligible       | \$4,178,787,230   | \$925,420         | Negligible       |
| Commercial                          | 1,087             | 2                | Negligible       | \$1,059,178,250   | \$926,400         | Negligible       |
| <b>Total</b>                        | 48,587            | 16               | Negligible       | \$5,237,965,480   | \$1,851,820       | Negligible       |



### **Estimation of Losses – Class I Dams**

Given the data contained in the asset inventory table above, the following are estimated losses that might be expected for breaches of the respective Class I dams. It is also projected that there would be no losses to human life associated with a failure of any or all Class I dams within Wood County.

### **Estimation of Losses – Middleton Township**

| Type of Parcel<br>(Occupancy Class) | Number of<br>Parcels in<br>Hazard Area | Value of Parcels<br>in Hazard Area |
|-------------------------------------|----------------------------------------|------------------------------------|
| Residential                         | 9                                      | \$925,420                          |
| Government                          | 1                                      | \$926,400                          |
| <b>Total</b>                        | 10                                     | \$1,851,820                        |

### **Estimation of Losses – North Baltimore**

| Type of Parcel<br>(Occupancy Class) | Number of<br>Parcels in<br>Hazard Area | Value of Parcels<br>in Hazard Area |
|-------------------------------------|----------------------------------------|------------------------------------|
| Residential                         | 14                                     | \$925,420                          |
| Commercial                          | 2                                      | \$926,400                          |
| <b>Total</b>                        | 16                                     | \$1,851,820                        |

## **Drought/Extreme Heat**

FEMA considers drought as “a persistent and abnormal moisture deficiency having adverse effects on vegetation, animals, or people.” Extreme heat, which may precede drought conditions, is considered to involve conditions where temperatures are 10 degrees or more above the average high temperature for the region and last for several weeks.

### **Profile of Hazard Events – Drought/Extreme Heat**

The following is a listing of annular periods of drought and related periods of extreme heat that have occurred in Wood County since 1900.

1930-36 (drought with periods of extreme heat)  
1939-1946 (drought with periods of extreme heat)  
1952-1957 (drought with periods of extreme heat)  
1959-1968 (drought with periods of extreme heat)  
1988 (drought/extreme heat)  
1995 (extreme heat)  
1996 (drought)  
1999 (drought/extreme heat)

## **Community Profile/Estimation of Losses – Drought/Extreme Heat**

Seasons of drought and periods of extreme heat can potentially occur during any particular year when climatic conditions are conducive. Effects of both drought and extreme heat would be expected to impact the entire County. Agricultural losses to crops and livestock would primarily be affected during periods of drought versus buildings and infrastructure. Drought can also result in the reduction of potable water supplies for humans and animals; necessitating water conservation methods. Extreme heat could result in adverse health-related affects to both humans and animals.

Financial losses to structures would not be applicable to periods of drought. As mentioned, losses of agricultural productivity would indeed be an issue. Definitive financial losses to agriculture due to drought are, for the most part, unavailable. The exception is \$200M in crop losses in 1999. These losses were projected over a 17 county area, including Wood County. Estimations of the percentage of crop loss were available for the 1996 and 1999 droughts. These losses were set at 10-30% individually. Using this range of percentage crop losses for corn, soybeans, and wheat and average yearly yields and prices (2001), the range of monetary losses for Wood County would be estimated at \$5M - \$15M. Data for the average yields and related costs were provided by the Ohio Farm Bureau.

Projected financial losses to structures/parcels due to extreme heat would not be applicable as well. Decreased water supplies and health-related effects to both humans and animals from extreme heat would also be difficult to project and quantify. Mitigation activities relating to drought and extreme heat would come primarily in the form of public education and other informational releases that would limit these effects on the community. Mitigation planning activities are addressed in a subsequent section of the Plan.

## **Earthquake**

Earthquakes are caused by the movements of the Earth's tectonic plates. Effects of earthquakes can range from minor ground motion to severe ground surface faults. Earthquake severity, in terms of magnitude, is measured using several different scales. For the purpose of this document, the Richter Magnitude Scale (RMS) as described below, will be used.

According to the US Geological Survey (USGS), the entirety of Wood County falls within the New Madrid Seismic Zone. This seismic zone has been the source of numerous earthquakes that have resulted in earthquakes of magnitudes that span the Richter Scale. The USGS identifies a Peak Acceleration Level (% g) for Wood County at 2-3%. This level is on a scale of 0-180 and would be considered relatively low risk.

| <b>Descriptor</b> | <b>Richter Magnitudes</b> | <b>Earthquake Effects</b>                                                                                                    | <b>Average Annually</b> |
|-------------------|---------------------------|------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Micro             | Less than 2.0             | Micro-earthquakes, not felt.                                                                                                 | About 8,000 per day     |
| Very minor        | 2.0-2.9                   | Generally not felt, but recorded.                                                                                            | About 1,000 per day     |
| Minor             | 3.0-3.9                   | Often felt, but rarely causes damage.                                                                                        | 49,000 (estimated)      |
| Light             | 4.0-4.9                   | Noticeable shaking of indoor items, rattling noises. Significant damage unlikely.                                            | 6,200 (estimated)       |
| Moderate          | 5.0-5.9                   | Can cause major damage to poorly constructed buildings over small regions. At most slight damage to well-designed buildings. | 800                     |
| Strong            | 6.0-6.9                   | Can be destructive in areas up to about 100 miles across in populated areas.                                                 | 120                     |
| Major             | 7.0-7.9                   | Can cause serious damage over larger areas.                                                                                  | 18                      |
| Great             | 8.0 or greater            | Can cause serious damage in areas several hundred miles across.                                                              | 1                       |

### **Profile of Hazard Events - Earthquake**

The following table describes the dates and associated Richter Magnitude Scale (RMS) determined for earthquake events occurring in Wood County. These data are from the Ohio Seismic Network and identify earthquakes with an RMS greater than 2.0

| <b>Date of Event</b> | <b>RMS</b> |
|----------------------|------------|
| 09/29/74             | 3.0        |
| 07/14/92             | 2.0        |
| 10/04/93             | 2.5        |
| 11/09/93             | 2.0        |

### **Community Profile/Estimation of Loses - Earthquake**

Effects to structures, as well as to infrastructure, may be possible from future incidences of an earthquake within the County. Past earthquake events have resulted in only minor structural damage. There have been no human loses (injuries or deaths). Based upon these historical data, the entirety of Wood County would continue to have an earthquake potential. However, as previously stated, the losses that might be incurred in such events would be estimated as minimal.

## **Flood**

Wood County contains a number of rivers, streams, and ditches that could potentially flood (see Appendix C, Fig. 6). Severe flooding would affect most Wood County waterways and, in turn, would impact properties that represent a variety of use groups. Depiction of the potential flooding during a 100-year flood is presented in Appendix C, Fig. 7. Of most concern are the Maumee River, providing the northern boundary of the County; the Portage River and its tributaries (including the Rocky Ford Creek); Dry Creek; and Crane and Henry Creeks that flow through Millbury (see Appendix C, Figs. 8-17).

Flooding could result from torrential rains occurring for a short period of time (flash floods), moderate to heavy rains lasting an extended period of time, normal level rains on saturated land areas, and from melting snow and ice, or from ice jams in waterways that release during increased water flow in winter.

### **Profile of Hazard Events - Flood**

The table below provides data on past flooding events. These data were obtained from a variety of sources including, but not limited to, the National Climate Data Center, the U.S. Geological Survey, FEMA, NOAA, personal interviews, Ohio Department of Natural Resources, Wood County Library research, and archival collections from Bowling Green State University. Due to the number of individual flooding events that have occurred in the past, only those of relative significance will be described. Mitigation planning for floods, however, will consider all occurrences.

| <b>Date of Occurrence</b> | <b>Location</b>                                                    | <b>Description of Losses</b>                               | <b>\$ in Losses (2003 Values)</b>       |
|---------------------------|--------------------------------------------------------------------|------------------------------------------------------------|-----------------------------------------|
| March 1913                | Countywide (Maumee and Portage Rivers)                             | Damage to homes, businesses, etc. throughout County        | No data found                           |
| January 1959              | Countywide (Maumee and Portage Rivers)                             | Extensive damage to homes, businesses, and roads           | \$3.2M – private<br>\$1.3M - public     |
| January 1993              | Grand Rapids (Maumee River)                                        | Flood caused damage to homes and businesses                | \$640,000                               |
| June 1997                 | Countywide (Maumee and Portage Rivers)                             | Damage to homes, businesses, crops, etc. throughout County | \$86,250 – property<br>\$23,000 - crops |
| August 1998               | Cygnnet, Bloomdale (Rocky Ford Creek), Pemberville (Portage River) | Flooded homes, businesses, roads, etc.                     | \$82,000                                |
| January 1999              | Grand Rapids (Maumee River)                                        | Flooded homes, businesses, roads, etc.                     | \$220,000                               |

### **Community Profile - Flood**

Flooding of County rivers and streams may result in damage to structures, personal property, roadways, and other infrastructure. Depending upon the severity of the flooding, evacuation of individuals may be necessary. With the exception of the Grand Rapids Fire Department, there are no critical facilities located within the 100-year floodplain. Backups of municipal sewerage systems would be possible as well as the pooling of water. The pooling of water poses the potential for mosquito breeding if the water remains for extended periods. Increased mosquito populations, in turn, increase the potential for the spread of mosquito-borne diseases.

Repetitive loss structures are also of concern when considering flooding of County properties. A repetitive loss structure is defined as one that is damaged in excess of \$1,000; occurring at a frequency of less than 10 years. An identification of those structures is maintained by FEMA and the Ohio Department of Natural Resources. According to repetitive loss structure data for Wood County, there are nine repetitive loss structures within the County; six in Grand Rapids, one in a rural area southeast of Grand Rapids, one in Bowling Green, and one in Millbury (see Appendix C, Figs. 18, 19, 20, and 21). The identification of repetitive loss structures is a valuable component of mitigation planning.

For the purposes of this hazard analysis, projections of affected parcels and associated monetary losses are based on the impacts resulting from a 100-year flood. Projections made for this Plan component relate to data obtained from FIRM (Flood Insurance Rate Maps). The digitized FIRM data were utilized with GIS to quantify the parcel information given below. Analysis is provided on the numbers and types of property parcels and their respective values found within the County. These figures are compared with those parcels determined to be within the hazard area. A percentage of those numbers and values are also given. Community Profiles and Estimation of Losses are addressed individually for the three watersheds determined to be of most concern.

The data below are provided for the entire floodplain as indicated, as well as for the individual incorporated areas impacted by the particular floodplain. The data for the individual incorporated areas reflect only the total number of parcels affected and their respective losses. These data are valuable in the eventual consideration of mitigation initiatives developed by individual incorporated political subdivisions.

### **Community Profile – Maumee River**

| <b>Type of Parcel</b> | <b>Number of Parcels</b> |                         |                         | <b>Value of Parcels</b> |                          |                         |
|-----------------------|--------------------------|-------------------------|-------------------------|-------------------------|--------------------------|-------------------------|
|                       | <b># in County</b>       | <b># in Hazard Area</b> | <b>% in Hazard Area</b> | <b>\$ in County</b>     | <b>\$ in Hazard Area</b> | <b>% in Hazard Area</b> |
| Residential           | 48,071                   | 1,240                   | 3%                      | \$4,178,787,230         | \$200,862,460            | 5%                      |
| Commercial            | 5,346                    | 106                     | 2%                      | \$1,059,178,250         | \$18,998,110             | 2%                      |
| Industrial            | 1,087                    | 2                       | Negligible              | \$381,182,030           | \$401,640                | Negligible              |
| Agricultural          | 8,346                    | 179                     | 2%                      | \$320,535,930           | \$10,392,390             | 3%                      |
| Religious             | 410                      | 9                       | 2%                      | \$84,359,500            | \$7,510,400              | 9%                      |
| Government            | 1,372                    | 113                     | 8%                      | \$800,837,900           | \$10,225,100             | 1%                      |
| Education             | 324                      | 15                      | 5%                      | \$223,483,400           | \$42,888,000             | 20%                     |
| <b>Total</b>          | 64,632                   | 1,664                   | 3%                      | \$6,824,880,840         | \$291,278,100            | 4%                      |

### **Community Profile – Maumee River (Incorporated Areas)**

| <b>Affected Incorporated Area</b> | <b>Number of Parcels</b> |                         |                         | <b>Value of Parcels</b> |                          |                         |
|-----------------------------------|--------------------------|-------------------------|-------------------------|-------------------------|--------------------------|-------------------------|
|                                   | <b># in Community</b>    | <b># in Hazard Area</b> | <b>% in Hazard Area</b> | <b>\$ in Community</b>  | <b>\$ in Hazard Area</b> | <b>% in Hazard Area</b> |
| Grand Rapids                      | 722                      | 146                     | 20%                     | \$43,635,890            | \$7,203,000              | 17%                     |
| Perrysburg                        | 8,014                    | 465                     | 6%                      | \$1,345,294,710         | \$66,406,800             | 5%                      |
| Rosford                           | 3,648                    | 296                     | 8%                      | \$427,629,810           | \$70,495,800             | 16%                     |
| Northwood                         | 3,948                    | 29                      | 1%                      | \$357,376,440           | \$3,927,810              | 1%                      |

### **Community Profile – Portage River (Including Rocky Ford Creek)**

| Type of Parcel | Number of Parcels |                  |                  | Value of Parcels |                   |                  |
|----------------|-------------------|------------------|------------------|------------------|-------------------|------------------|
|                | # in County       | # in Hazard Area | % in Hazard Area | \$ in County     | \$ in Hazard Area | % in Hazard Area |
| Residential    | 48,071            | 744              | 2%               | \$4,178,787,230  | \$52,683,660      | 1%               |
| Commercial     | 5,346             | 62               | 1%               | \$1,059,178,250  | \$3,091,880       | Negligible       |
| Industrial     | 1,087             | 16               | 1%               | \$381,182,030    | \$1,810,680       | Negligible       |
| Agricultural   | 8,346             | 779              | 9%               | \$320,535,930    | \$33,718,150      | 1%               |
| Religious      | 410               | 5                | 1%               | \$84,359,500     | \$1,321,500       | 2%               |
| Government     | 1,372             | 42               | 3%               | \$800,837,900    | \$2,549,500       | Negligible       |
| <b>Total</b>   | 64,632            | 1,648            | 3%               | \$6,824,880,840  | \$93,853,870      | 1%               |

### **Community Profile – Portage River/Rocky Ford Creek (Incorporated Areas)**

| Affected Incorporated Area | Number of Parcels |                  |                  | Value of Parcels |                   |                  |
|----------------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|
|                            | # in Community    | # in Hazard Area | % in Hazard Area | \$ in Community  | \$ in Hazard Area | % in Hazard Area |
| Cygnets                    | 640               | 65               | 10%              | \$13,950,310     | \$667,170         | 5%               |
| North Baltimore            | 2,522             | 51               | 2%               | \$107,693,100    | \$3,110,320       | 3%               |
| Pemberville                | 1,002             | 205              | 20%              | \$68,836,560     | \$12,307,620      | 18%              |
| Portage                    | 388               | 19               | 5%               | \$19,091,560     | \$1,211,240       | 6%               |
| West Millgrove             | 191               | 3                | 2%               | \$3,518,480      | \$30,160          | 1%               |

### **Community Profile – Dry Creek**

| Type of Parcel | Number of Parcels |                  |                  | Value of Parcels |                   |                  |
|----------------|-------------------|------------------|------------------|------------------|-------------------|------------------|
|                | # in County       | # in Hazard Area | % in Hazard Area | \$ in County     | \$ in Hazard Area | % in Hazard Area |
| Residential    | 48,071            | 528              | 1%               | \$4,178,787,230  | \$51,267,890      | 1%               |
| Commercial     | 5,346             | 77               | 1%               | \$1,059,178,250  | \$23,621,080      | 2%               |
| Industrial     | 1,087             | 22               | 2%               | \$381,182,030    | \$22,027,860      | 6%               |
| Agricultural   | 8,346             | 45               | 1%               | \$320,535,930    | \$868,560         | Negligible       |
| Religious      | 410               | 6                | 1%               | \$84,359,500     | \$4,045,000       | 5%               |
| Government     | 1,372             | 9                | 1%               | \$800,837,900    | \$33,772,400      | 4%               |
| <b>Total</b>   | 64,632            | 687              | 1%               | \$6,824,880,840  | \$115,602,790     | 2%               |

### **Community Profile – Dry Creek (Incorporated Areas)**

| Affected Incorporated Area | Number of Parcels |                  |                  | Value of Parcels |                   |                  |
|----------------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|
|                            | # in Community    | # in Hazard Area | % in Hazard Area | \$ in Community  | \$ in Hazard Area | % in Hazard Area |
| Walbridge                  | 1,421             | 315              | 22%              | \$104,910,850    | \$33,067,610      | 32%              |

### **Community Profile – Crane and Henry Creeks**

| Type of Parcel | Number of Parcels |                  |                  | Value of Parcels       |                     |                  |
|----------------|-------------------|------------------|------------------|------------------------|---------------------|------------------|
|                | # in County       | # in Hazard Area | % in Hazard Area | \$ in County           | \$ in Hazard Area   | % in Hazard Area |
| Residential    | 48,071            | 231              | Negligible       | \$4,178,787,230        | \$18,336,720        | Negligible       |
| Commercial     | 5,346             | 22               | Negligible       | \$1,059,178,250        | \$12,183,960        | 1%               |
| Agricultural   | 8,346             | 91               | 1%               | \$320,535,930          | \$4,814,970         | Negligible       |
| Religious      | 410               | 4                | 1%               | \$84,359,500           | \$716,300           | 1%               |
| Government     | 1,372             | 2                | Negligible       | \$800,837,900          | \$132,900           | Negligible       |
| <b>Total</b>   | <b>64,632</b>     | <b>389</b>       | <b>1%</b>        | <b>\$6,824,880,840</b> | <b>\$36,191,960</b> | <b>1%</b>        |

### **Community Profile – Crane and Henry Creeks (Incorporated Areas)**

| Affected Incorporated Area | Number of Parcels |                  |                  | Value of Parcels |                   |                  |
|----------------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|
|                            | # in Community    | # in Hazard Area | % in Hazard Area | \$ in Community  | \$ in Hazard Area | % in Hazard Area |
| Millbury                   | 743               | 126              | 17%              | \$50,338,370     | \$7,594,530       | 15%              |

### **Estimation of Losses - Flood**

As with the previous component, estimates of losses will be provided for each watershed considered to be most at risk.

### **Estimation of Losses – Maumee River**

| Type of Parcel (Occupancy Class) | Number of Parcels in Hazard Area | Value of Parcels in Hazard Area |
|----------------------------------|----------------------------------|---------------------------------|
| Residential                      | 1,240                            | \$200,862,460                   |
| Commercial                       | 106                              | \$18,998,110                    |
| Industrial                       | 2                                | \$401,640                       |
| Agricultural                     | 179                              | \$10,392,390                    |
| Religious                        | 9                                | \$7,510,400                     |
| Government                       | 113                              | \$10,225,100                    |
| Education                        | 15                               | \$42,888,000                    |
| <b>Total</b>                     | <b>1,664</b>                     | <b>\$291,278,100</b>            |

### **Est. of Losses – Maumee River (Incorporated)**

| Affected Incorporated Area | Number of Parcels in Hazard Area | Value of Parcels in Hazard Area |
|----------------------------|----------------------------------|---------------------------------|
| Grand Rapids               | 146                              | \$7,203,000                     |
| Perrysburg                 | 465                              | \$66,406,800                    |
| Rossford                   | 296                              | \$70,495,800                    |
| Northwood                  | 29                               | \$3,927,810                     |

**Est. of Losses – Portage River/ R. F. Creek**

| Type of Parcel<br>(Occupancy Class) | Number of<br>Parcels in<br>Hazard<br>Area | Value of<br>Parcels in<br>Hazard Area |
|-------------------------------------|-------------------------------------------|---------------------------------------|
| Residential                         | 744                                       | \$52,683,660                          |
| Commercial                          | 62                                        | \$3,091,880                           |
| Industrial                          | 16                                        | \$1,810,680                           |
| Agricultural                        | 779                                       | \$33,718,150                          |
| Religious                           | 5                                         | \$1,321,500                           |
| Government                          | 42                                        | \$2,549,500                           |
| <b>Total</b>                        | <b>1,648</b>                              | <b>\$93,853,870</b>                   |

**Est. of Losses – Portage River (Incorporated)**

| Affected<br>Incorporated<br>Area | Number of<br>Parcels in<br>Hazard Area | Value of<br>Parcels in<br>Hazard<br>Area |
|----------------------------------|----------------------------------------|------------------------------------------|
| Cygnets                          | 65                                     | \$667,170                                |
| North Baltimore                  | 51                                     | \$3,110,320                              |
| Pemberville                      | 205                                    | \$12,307,620                             |
| Portage                          | 19                                     | \$1,211,240                              |
| West Millgrove                   | 3                                      | \$30,160                                 |

**Estimation of Losses – Dry Creek**

| Type of Parcel<br>(Occupancy Class) | Number of<br>Parcels in<br>Hazard<br>Area | Value of<br>Parcels in<br>Hazard Area |
|-------------------------------------|-------------------------------------------|---------------------------------------|
| Residential                         | 744                                       | \$52,683,660                          |
| Commercial                          | 62                                        | \$3,091,880                           |
| Industrial                          | 16                                        | \$1,810,680                           |
| Agricultural                        | 779                                       | \$33,718,150                          |
| Religious                           | 5                                         | \$1,321,500                           |
| Government                          | 42                                        | \$2,549,500                           |
| <b>Total</b>                        | <b>1,648</b>                              | <b>\$93,853,870</b>                   |

**Est. of Losses – Dry Creek (Incorporated)**

| Affected<br>Incorporated<br>Area | Number of<br>Parcels in<br>Hazard<br>Area | Value of<br>Parcels in<br>Hazard Area |
|----------------------------------|-------------------------------------------|---------------------------------------|
| Walbridge                        | 315                                       | \$33,067,610                          |

**Est. of Losses – Crane/Henry Creeks**

| Type of Parcel<br>(Occupancy Class) | Number of<br>Parcels in<br>Hazard<br>Area | Value of<br>Parcels in<br>Hazard Area |
|-------------------------------------|-------------------------------------------|---------------------------------------|
| Residential                         | 231                                       | \$18,336,720                          |
| Commercial                          | 22                                        | \$12,183,960                          |
| Agricultural                        | 91                                        | \$4,814,970                           |
| Religious                           | 4                                         | \$716,300                             |
| Government                          | 2                                         | \$132,900                             |
| <b>Total</b>                        | <b>389</b>                                | <b>\$36,191,960</b>                   |

**Est. of Losses – Crane Creek (Incorporated)**

| Affected<br>Incorporated<br>Area | Number of<br>Parcels in<br>Hazard<br>Area | Value of<br>Parcels in<br>Hazard Area |
|----------------------------------|-------------------------------------------|---------------------------------------|
| Millbury                         | 126                                       | \$7,594,530                           |



## Hailstorm

Hail is a product of raindrops that are frozen in the upper atmosphere that fall to earth due to gravity. The size of individual hail stones vary, contingent upon their being repeatedly blown into higher elevations. Hailstorms are always associated with heavy rain, gusty winds, thunderstorms, and lightning. Depending upon the size of the hailstones and the severity of the respective storm, damage can occur to property (structures, vehicles, etc.) as well as to crops.

### **Profile of Hazard Events - Hailstorm**

According to various sources, 48 hailstorms have occurred within Wood County from 1966 to the present. Most have not been quantified in terms of financial losses. Specific incidents of hailstorms with quantified losses are identified below.

| <b>Date of Occurrence</b> | <b>Location</b> | <b>Description of Losses</b>                                                 | <b>\$ in Losses (2003 Values)</b>      |
|---------------------------|-----------------|------------------------------------------------------------------------------|----------------------------------------|
| August 1998               | Tontogany       | Losses to crops in the surrounding community (hail size diameter – 0.75 in.) | \$11,000                               |
| August 1999               | Bowling Green   | Losses to crops in the surrounding community (hail size diameter – 1.00 in.) | \$5,500                                |
| May 2000                  | Luckey          | Property damage (hail size diameter – 0.88 in.)                              | \$5,500                                |
| May 2000                  | Tontogany       | Losses to property and crops (hail size diameter – 4.50 in.)                 | \$1.1M – property<br>\$110,000 - crops |
| May 2002                  | Perrysburg      | Losses to crops in the surrounding community (hail size diameter – 2.50 in.) | \$635,000                              |

### **Community Profile/ Estimation of Losses - Hailstorm**

As noted, hailstorms have, and will continue to provide, the potential for causing damage to structures, personal property, and crops throughout Wood County – including critical facilities. Impact on infrastructure would be considered as minimal. Damage costs resulting from hailstorms can be extremely variable; documented here as ranging from several thousands of dollars to over \$1M. Because of this variability, no specific estimates of losses are provided. Even though financial losses can be potentially extensive, mitigation activities associated with hailstorms from a planning perspective are considered as having low priority.

## Severe Winter Storm

Severe winter storms can produce a variety of adverse weather conditions. These include heavy snow, blizzards, ice storms, and extreme cold. Damage to structures due to severe winter storms is not as likely to occur as are loss of services – primarily electrical service. Severe winter storms can contribute to other losses including vehicular accidents, personal injuries, and losses of life.

### **Profile of Hazard Events – Severe Winter Storm**

Over the past 100 years, there have been a number of severe winter storms that have affected Wood County. Most have involved multiple counties. Those most notable are described below. Due to the fact that severe winter weather events involve multiple counties, quantifications of losses are typically based on the region affected. Losses incurred to Wood County alone have not been identified.

| <b>Date of Occurrence</b> | <b>Location</b>                            | <b>Description of Losses</b>                                                                                 | <b>\$ in Losses (2003 Values)</b> |
|---------------------------|--------------------------------------------|--------------------------------------------------------------------------------------------------------------|-----------------------------------|
| Feb. 1905                 | Countywide                                 | 8-10 foot drifts                                                                                             | No data found                     |
| Jan. 1918                 | Countywide                                 | 10 foot drifts                                                                                               | No data found                     |
| Nov. 1950                 | Countywide                                 | Blowing and drifting snow                                                                                    | No data found                     |
| Jan. 1978                 | Countywide<br>(Northeastern United States) | Damage to some homes, roads closed, personal property damage (35 lives lost in Ohio)                         | \$9.8M (Statewide)                |
| Feb. 1993                 | Countywide (five counties)                 | Heavy Snow                                                                                                   | \$650,000                         |
| Jan. 1995                 | Countywide (21 counties)                   | Blowing and drifting snow, power outages, damage to several homes and personal property                      | \$600,000                         |
| Jan. 1999                 | Countywide (17 counties)                   | Sleet, freezing rain, snow up to 10 in. Damage to homes, businesses, agriculture, etc.                       | \$660,000                         |
| Dec. 2000                 | Countywide (28 counties)                   | Freezing rain, snow up to 7 in. blowing and drifting                                                         | \$2.75M                           |
| Jan. 2002                 | Countywide (four counties)                 | Ice Storm                                                                                                    | \$3.0M                            |
| Mar. 2002                 | Countywide (28 counties)                   | Blowing and drifting snow, freezing rain, roads treacherous, accidents resulting in personal property damage | \$5.2M                            |
| Dec. 2002                 | Countywide (24 counties)                   | Heavy snows, blowing and drifting, many vehicular accidents                                                  | \$3.1M                            |

### **Community Profile/ Estimation of Losses – Severe Winter Storm**

In consideration that winter storms can adversely impact the entirety of Wood County during any winter season with varying severity, projected losses cannot be estimated with any degree of certainty. With few exceptions, structural damage from future severe winter storms, as well as the impact on infrastructure, would be predicted as minimal. Projected physical damage to critical facilities would be considered minimal as well. As previously indicated, losses of services and personal property through vehicular accidents and similar maladies would be more indicative of this type of natural disaster. Data on specific County-based losses are either not available or a part of multi-county incidents. Given the absence of more definitive data and the difficulties in predicting the effects from such disasters, specific projections of losses will not be provided at this time.

## Tornado

Tornadoes are violent storms with rotating winds of high velocity. They appear as funnel-shaped clouds extending toward the ground from the base of a thunderstorm cloud (wall cloud). Tornadoes are discerned by the velocity of their rotating winds. The Fujita Scale below identifies the different types of tornadoes.

### The Fujita Scale

| <b>F-Scale Number</b> | <b>Intensity Phrase</b>                      | <b>Type of Damage Done</b>                                                                                                                                                                                                                                        |
|-----------------------|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>F0</b>             | <b>Gale tornado<br/>(40-72 mph)</b>          | <b>Light damage. Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages sign boards.</b>                                                                                                                                   |
| <b>F1</b>             | <b>Moderate tornado<br/>(73-112 mph)</b>     | <b>Moderate damage. The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.</b>                               |
| <b>F2</b>             | <b>Significant tornado<br/>(113-157 mph)</b> | <b>Significant damage. Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.</b>                                                                      |
| <b>F3</b>             | <b>Severe tornado<br/>(158-206 mph)</b>      | <b>Severe damage. Roof and some walls torn off well constructed houses; trains overturned; most trees in forest uprooted. Cars lifted off ground and thrown.</b>                                                                                                  |
| <b>F4</b>             | <b>Devastating tornado<br/>(207-260 mph)</b> | <b>Devastating damage. Well-constructed houses leveled; Parcels with weak foundations blown off some distance; cars thrown and large missiles generated.</b>                                                                                                      |
| <b>F5</b>             | <b>Incredible tornado<br/>(261-318 mph)</b>  | <b>Incredible damage. Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters; trees debarked; steel re-enforced concrete Parcels badly damaged.</b> |

Wood County is located on the northeast fringe of a geographical area within the United States known as “Tornado Alley.” This designation indicates an area of the United States that has a greater potential for occurrence of tornadoes. The relative strength of the storms most likely to impact Tornado Alley is also greater than in other locations of the country. According to the American Society of Civil Engineers (ASCE), Wood County is located in Zone IV. This indicates that community shelters within this zone should be constructed to withstand a wind speed of 250 mph. Losses resulting from tornadoes within Wood County include those to personal property, agricultural components (crops, livestock, etc.), services, as well as injuries and deaths of community residents.

## **Profile of Hazard Events - Tornado**

According to the National Climate Data Center, there have been 23 tornadoes between June 1953 and November 2002. They have ranged in strength (Fugita Scale) from F-0 (9) to F-4 (1). Earlier tornadoes have been documented but have not been categorized by strength.

The following table describes some of the tornadoes that have occurred within Wood County over the past 100 years.

| <b>Date of Occurrence</b> | <b>Location</b>                        | <b>Description of Losses</b>                                   | <b>\$ in Losses (2003 Values)</b> |
|---------------------------|----------------------------------------|----------------------------------------------------------------|-----------------------------------|
| June 1905                 | Southern Wood County                   | Damage to homes and other structures                           | No data found                     |
| March 1920                | Bowling Green area                     | Damage to homes and other structures                           | No data found                     |
| June 1953                 | Southern Wood County (F-4 Tornado)     | 8 dead, 24 injured, losses of 60 structures, and 100 livestock | \$10.4M                           |
| April 1980 (2)            | Entire County (1 Northern, 1 Southern) | Damage to homes and other structures (4 four injuries)         | \$550,000                         |
| May 1983                  | Mid-County area (Weston)               | Damage to homes and other structures, one death                | \$45M                             |
| July 1992 (3)             | All Mid-County                         | Damage to schools, homes, and other structures, seven injuries | \$3.6M                            |
| May/June 2000 (3)         | Pemberville (2), Hoytville             | Damage to homes and other structures                           | \$385,000                         |
| Nov. 2002 (3)             | Jerry City, Stony Ridge, and Millbury  | Damage to homes and other structures                           | \$1.1M                            |

## **Community Profile – Tornado**

As mentioned, the entirety of Wood County is at risk for the occurrence of tornadoes of varying strengths during any period when climatic conditions are favorable. Damage to structures, personal property, infrastructure, as well as injuries and deaths are possible; including adverse impacts to critical facilities. Wood County, in general, would be considered at moderate risk for the potential for a tornado to occur during any particular tornado season.

In addressing the potential losses that might be incurred to parcels within the County due to a tornado, two scenarios have been devised that would be considered as worst case. The scenarios projected here incorporated the following assumptions. Considering tornado strength, an F-4 was selected to be the most logical of the severe tornadoes to impact the County. In determining length/width of the projected path, several sources were consulted. First, an average was taken of both parameters for all the F-4 tornadoes identified in Ohio by the National Climate Data Center. Secondly, discussions with representatives from the National Weather Service office in Cleveland, Ohio provided the additional data necessary to make the projection. Based on the information obtained, the estimated length of the path was set at 20 miles and the width at 400 yards. Plotting this path in an East-northeasterly direction resulted in the depictions shown in Appendix C, Figs. 22 and 23 as well as the following projected losses.

### **Community Profile – Bowling Green Area Scenario**

| Type of Parcel | Number of Parcels |                  |                  | Value of Parcels       |                      |                  |
|----------------|-------------------|------------------|------------------|------------------------|----------------------|------------------|
|                | # in County       | # in Hazard Area | % in Hazard Area | \$ in County           | \$ in Hazard Area    | % in Hazard Area |
| Residential    | 48,071            | 950              | 2%               | \$4,178,787,230        | \$72,546,530         | 2%               |
| Commercial     | 5,346             | 180              | 3%               | \$1,059,178,250        | \$1,149,800          | Negligible       |
| Industrial     | 1,087             | 50               | 5%               | \$381,182,030          | \$1,835,200          | Negligible       |
| Agricultural   | 8,346             | 133              | 2%               | \$320,535,930          | \$7,990,130          | 2%               |
| Religious      | 410               | 6                | 1%               | \$84,359,500           | \$2,589,800          | 3%               |
| Government     | 1,372             | 58               | 4%               | \$800,837,900          | \$1,948,200          | 2%               |
| Education      | 324               | 3                | 1%               | \$223,483,400          | \$45,928,200         | 21%              |
| <b>Total</b>   | <b>64,956</b>     | <b>1,380</b>     | <b>2%</b>        | <b>\$7,048,364,240</b> | <b>\$133,987,860</b> | <b>2%</b>        |

### **Community Profile – Perrysburg/Northwood/Rossford Area Scenario**

| Type of Parcel | Number of Parcels |                  |                  | Value of Parcels       |                      |                  |
|----------------|-------------------|------------------|------------------|------------------------|----------------------|------------------|
|                | # in County       | # in Hazard Area | % in Hazard Area | \$ in County           | \$ in Hazard Area    | % in Hazard Area |
| Residential    | 48,071            | 1448             | 3%               | \$4,178,787,230        | \$193,227,160        | 2%               |
| Commercial     | 5,346             | 131              | 2%               | \$1,059,178,250        | \$40,123,200         | Negligible       |
| Industrial     | 1,087             | 53               | 5%               | \$381,182,030          | \$15,609,900         | Negligible       |
| Agricultural   | 8,346             | 20               | Negligible       | \$320,535,930          | \$4,455,920          | Negligible       |
| Religious      | 410               | 8                | 2%               | \$84,359,500           | \$480,100            | Negligible       |
| Government     | 1,372             | 26               | 2%               | \$800,837,900          | \$8,206,600          | Negligible       |
| Education      | 324               | 10               | 3%               | \$223,483,400          | \$38,335,800         | 17%              |
| <b>Total</b>   | <b>64,956</b>     | <b>1,696</b>     | <b>3%</b>        | <b>\$7,048,364,240</b> | <b>\$300,438,680</b> | <b>4%</b>        |

### **Estimation of Losses - Tornado**

The following are estimates of losses from the two scenarios described.

### **Estimation of Losses – Bowling Green Scenario**

| Type of Parcel (Occupancy Class) | Number of Parcels in Hazard Area | Value of Parcels in Hazard Area |
|----------------------------------|----------------------------------|---------------------------------|
| Residential                      | 950                              | \$72,546,530                    |
| Commercial                       | 180                              | \$1,149,800                     |
| Industrial                       | 50                               | \$1,835,200                     |
| Agricultural                     | 133                              | \$7,990,130                     |
| Religious                        | 6                                | \$2,589,800                     |
| Government                       | 58                               | \$1,948,200                     |
| Education                        | 3                                | \$45,928,200                    |
| <b>Total</b>                     | <b>1,380</b>                     | <b>\$133,987,860</b>            |

### **Estimation of Losses – Perrysburg/Northwood/Rossford Area Scenario**

| <b>Type of Parcel<br/>(Occupancy<br/>Class)</b> | <b>Number of<br/>Parcels in<br/>Hazard Area</b> | <b>Value of<br/>Parcels in<br/>Hazard Area</b> |
|-------------------------------------------------|-------------------------------------------------|------------------------------------------------|
| Residential                                     | 1448                                            | \$193,227,160                                  |
| Commercial                                      | 131                                             | \$40,123,200                                   |
| Industrial                                      | 53                                              | \$15,609,900                                   |
| Agricultural                                    | 20                                              | \$4,455,920                                    |
| Religious                                       | 8                                               | \$480,100                                      |
| Government                                      | 26                                              | \$8,206,600                                    |
| Education                                       | 10                                              | \$38,335,800                                   |
| <b>Total</b>                                    | <b>1,696</b>                                    | <b>\$300,438,680</b>                           |

### **Estimation of Losses – 1953 Tornado**

The following data represent a comparison of the damage that might have resulted if the 1953 tornado would have occurred in 2003. (see Appendix C, Fig. 24). The number of parcels affected and monetary losses incurred were calculated using 2003 data.

|              | <b>Number of Parcels</b>           |                                    | <b>Value of Parcels</b>             |                                     |
|--------------|------------------------------------|------------------------------------|-------------------------------------|-------------------------------------|
|              | <b># in Hazard<br/>Area - 1953</b> | <b># in Hazard<br/>Area - 2003</b> | <b>\$ in Hazard<br/>Area - 1953</b> | <b>\$ in Hazard<br/>Area - 2003</b> |
| <b>Total</b> | 60                                 | 403                                | \$1,500,000                         | \$18,108,700                        |

## **Windstorm**

Windstorms could be characterized as periods where either of the following occurs: 1) sustained non-rotating surface winds (1-minute average) of 40 mph (35 knots) or greater lasting for 1 hour or longer; or 2) sustained non-rotating winds or gusts of 58 mph (50 knots) or greater for any duration. These could also be considered as “straight-line” winds.

Exacerbating these conditions within Wood County are its topographical features which indicate that, for the most part, the County is relatively flat. With the exceptions of multiple-story structures within metropolitan areas, there are few obstructions to limit the intensity of the winds that routinely move across the County. Severe winds, as those identified above, do indeed present conditions that have caused damage throughout areas of Wood County.

### **Profile of Hazard Events - Windstorm**

Incidents of windstorms and their resulting damages have occurred frequently in the past within the County. Generally, damage has been limited to the downing of tree limbs and power lines, partial losses to structures, and similar conditions that reflect a moderate range of damage. The most volatile of the historical windstorm occurrences are as follows:

| <b>Date of Occurrence</b>   | <b>Location</b>                           | <b>Description of Losses</b>                                                                                        | <b>\$ in Losses (2003 Values)</b>                       |
|-----------------------------|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|
| April 1957                  | Entire County                             | Damage to homes, barns, power lines (4 injuries)                                                                    | No data found                                           |
| April 1980                  | Southern Wood County                      | Trees downed, structural damage                                                                                     | No data found                                           |
| May 1983                    | Northern Wood County                      | Damage to homes, barns, power lines                                                                                 | No data found                                           |
| July 1992                   | Entire County                             | Damage to homes, schools, etc. (seven injuries)                                                                     | No data found                                           |
| Nov. 1994 (three incidents) | Entire County (41 Ohio counties affected) | Damage to homes, trees downed, electrical services lost (several injuries)                                          | \$1.2M (in affected areas)                              |
| March 1996                  | Entire County (23 Ohio counties affected) | Damage to homes, barns, power lines                                                                                 | \$635,000 (in affected areas)                           |
| Oct. 1996                   | Entire County (30 Ohio counties affected) | Severe damage to homes, churches, trees downed, electrical services lost (one death, two injured in affected areas) | \$6.4M – property<br>\$2.8M – crops (in affected areas) |
| Dec. 2000                   | Entire County (27 Ohio counties affected) | Severe damage to homes, trees downed, electrical services lost                                                      | \$4.8M (in affected areas)                              |
| March 2002                  | Entire County (28 Ohio counties affected) | Severe damage to homes, trees downed, electrical services lost                                                      | \$8.9M (in affected areas)                              |

### **Community Profile/ Estimation of Losses - Windstorm**

As previously mentioned, windstorms present potential damaging effects on structures and other personal property throughout the entirety of the County. Effects on infrastructure would be considered minimal. Damage would most generally be limited and total destruction would be rare. Additionally, monetary losses identified in the table above are either not available or represent losses over multiple county areas. Because of these conditions, quantifying losses to properties becomes difficult and will not be provided as a part of this document. The potential of windstorm occurrence would be considered as high.

### **Conclusions**

Hazard analysis, as it relates to the mitigation of natural disasters within Wood County, involves several processes. The first is to obtain data and information on relevant hazards that have, and will continue to, affect County property and populations. Subsequently, these data and relevant information are reviewed and analyzed using established parameters. Once completed, the results of this review can be used to develop and implement specific mitigation efforts that will be of most benefit to Wood County and its citizens.

The review and analysis of the Hazard Analysis section was performed by the Wood County Mitigation Planning Committee. This review entailed the initial consideration of the entirety of data and information contained in this section. Each natural disaster identified as a part of Hazard Identification was then rated on the basis of three criteria: the potential for the occurrence of the disaster; the severity of the impact on

populations and property; and the level of need for implementing mitigation activities relating to that specific natural disaster. The natural disasters were then assessed using those criteria. Criteria parameters were set at three levels; low, moderate, and high. Results from this review are as follows:

| <b>Type of Hazard</b> | <b>Potential for Occurrence</b> | <b>Severity of Impact</b> | <b>Mitigation Potential</b> |
|-----------------------|---------------------------------|---------------------------|-----------------------------|
| Class I Dam Failure   | Low                             | Low                       | Low                         |
| Drought/Extreme Heat  | Moderate/Moderate               | Moderate/Low              | Low*/Moderate*              |
| Earthquake            | Low                             | Low                       | Low                         |
| Flood                 | High                            | High                      | High**                      |
| Hailstorm             | Moderate                        | Moderate                  | Low                         |
| Severe Winter Storm   | Moderate                        | Moderate                  | High*                       |
| Tornado               | Moderate                        | High                      | High**                      |
| Windstorm             | High                            | Moderate                  | Low                         |

\* Potential for public information only

\*\* Potential for mitigation including public information

As stated, these determinations will be valuable in identifying and proposing specific mitigation projects. The mitigation projects proposed in a forthcoming section of the Plan will be based upon this overall assessment and will be designed to lessen the adverse impacts of natural disasters on the citizens of Wood County.



## **Section Four: Mitigation Goals and Activities**

### **Mitigation Goals**

Establishing achievable goals forms the foundation for the activities that will assist Wood County in attaining the overall mission of the Mitigation Planning Committee.

Prior to the identification of specific mitigation goals, existing County plans were reviewed to determine their potential impact on the goals. The plans reviewed include Wood County's *Comprehensive Plan: A Guide for Growth 1998-2003*, the Wood County Emergency Management Agency's *Emergency Operations and All Hazards Plan*, and various floodplain management ordinances from County incorporated areas (e.g. Pemberville, Grand Rapids, and North Baltimore). The County's Comprehensive Plan addresses multiple planning initiatives including floodplain management, the management of wetlands, zoning and land use, agricultural resources, infrastructure, transportation, and other planning issues that may impact the County.

Provisions within the established plans reflected satisfactory applications of mitigation considerations. Continuation and strengthening of mitigation provisions in these existing plans and ordinances is addressed in Section Five: Mitigation Action Plans.

Potential goals were established by the Mitigation Planning Committee based upon their relationship to the potential adverse impact upon the community. These goals were identified and separated by hazard. Those goals that address mitigation for the entirety of the natural hazards that might impact the County are provided under the heading of "multi-hazard goals." Additional goals specifically addressing tornados and floods are listed under their respective headings. The goals adopted reflect the consensus of the Committee and are as follows:

### **Multi-Hazard Goals**

- Enhance public information and educational programs for both pre-disaster and post-disaster situations
  - Adequate knowledge of natural disasters and their effects is paramount to the protection of the citizens of Wood County. Timely dissemination of educational materials can reduce the adverse effects to life and property both before and after the occurrence of a natural disaster
- Strengthen existing partnerships among all public and private sectors within and beyond Wood County
  - Cooperative relationships among all sectors of the community enhance planning efforts, the development of mitigation initiatives, and the ability to appropriately respond to the impacts of natural disasters
- Integrate, as necessary, mitigation components within the existing Wood County plans whose provisions are influenced by the mitigation of natural disasters

- Assuring the presence of natural disaster mitigation components within all relevant Wood County plans, enhances the protection of citizens, personal property, and natural systems throughout the County
- Identify and pursue opportunities for funding of mitigation projects
  - Adequate funding sources must continually be identified and solicited, and monies successfully obtained, in order to fully achieve the intended purpose of natural disaster mitigation within Wood County
- Solidify mitigation initiatives directed toward critical facilities (schools, medical facilities, emergency services, etc.)
  - Critical facilities, such as schools, hospitals, nursing homes, fire departments, and law enforcement offices, must be afforded maximum consideration for mitigation initiatives to assure their functioning following occurrences of natural disasters

### **Tornado Goals**

- Enhance early warning systems to maximize public notification
  - Early warning of Wood County citizens on impending natural disasters is crucial in minimizing injuries, deaths, and losses to personal property

### **Flood Goals**

- Minimize flood losses to structures and properties within Wood County
  - Repetitive losses to structures and properties due to flooding need to be minimized to limit financial losses

## **Mitigation Activities**

Mitigation activities are those which direct the implementation of tasks that will accomplish the goals established by the Mitigation Committee. These activities are also directed toward the hazards outlined in the Hazard Analysis section and their respective priority levels. The mitigation activities identified will be used to develop action plans and specific tasks associated with those plans.

Developing or continuing existing mitigation activities is contingent upon an understanding of those activities currently in place. The following provides an explanation of the major mitigation activities already implemented by County political subdivisions.

There are, at this time, no definitive mitigation activities that address Class I dam failure, drought, earthquake, hailstorm, and windstorm. There are, however, public information and response activities in place that may need to be implemented to lessen the impact of these disasters. Preliminary notification of an impending hailstorm or high wind advisories, for example, would be managed through the National Weather Service via local news media sources and the Emergency Alert System. Lessening the

impacts of the adverse effects from a Class I dam failure or earthquake (flood damage, power outage, debris removal, etc.) may involve both public information and formal response actions undertaken by public entities.

Formal mitigation activities are currently in place for those natural disasters deemed to be of greatest concern to the County; tornado, flood, and indirectly, severe winter storm. Some of the more important activities are as follows:

### Tornado

The presence of early warning tornado sirens dispersed through the County provides the most substantial mitigation effort relating to tornados. Installation and placement of warning sirens is a function of cooperative efforts between the political subdivision in question and the Wood County Emergency Management Agency (WCEMA). Testing of these warning devices is conducted routinely under the auspices of WCEMA. Formal activation of tornado sirens follows procedures established by WCEMA and other public safety entities within the County.

Pre-disaster information on tornado topics (definitions of watches/warnings, sheltering issues, etc.) are available through and disseminated by various entities including the Wood County EMA, the Wood County Health Department, American Red Cross, and others.

Public notification relating to the potential development and sighting of tornados is primarily through the watches/warnings issued by the National Weather Service and disseminated via the local TV/radio stations and the National Oceanic and Atmospheric Administration (NOAA) weather radio system.

Post-disaster mitigation activities, as described above, may involve both preventative and response components. Public information to lessen the impacts of the disaster, are, as well, available from the Wood County Health Department and other public service organizations (American Red Cross, etc.). Removal of debris, repairing downed power lines, traffic control, and other response activities are a function of cooperative efforts outlined in WCEMA's *Emergency Operations and All Hazards Plan*.

### Flood

The *Comprehensive Plan: A Guide for Growth; 1998-2003* for Wood County has established parameters for floodplain management activities within the unincorporated areas of Wood County. It also addresses the management of wetlands, zoning and land use, agricultural resources, infrastructure, transportation, and other services that may be impacted by flooding.

The County's *Flood Damage Prevention Regulations* incorporate specific requirements relating to construction and other types of development within determined floodplain areas. Flood hazard areas within the County (both incorporated and unincorporated) are identified by the Federal Emergency Management Agency (FEMA) from Flood Insurance Studies conducted by the Ohio Department of Natural Resources. Flood Insurance Rate Maps (FIRM) and other flood data form the foundation of these reports.

Educational information for citizens on post-flood disaster activities (cleanup procedures, managing water/food supplies contaminated by flood waters, etc.) are also available from public entities such as the Wood County Health Department.

The Wood County Emergency Management Agency's *Emergency Operations and All Hazards Plan* addresses mitigation activities for flooding from both preventative and response perspectives. Information from the National Weather Service to County citizens is provided through the Wood County Emergency Management Agency, local news media, and the National Oceanic and Atmospheric Administration (NOAA) weather radio system.

All applicable incorporated areas within the County have also established floodplain management programs as a part of the National Flood Insurance Program. Most generally, jurisdictional requirements for construction and other development within identified floodplain areas mimic the *Flood Damage Prevention Regulations* adopted by the Board of County Commissioners.

Additionally, Manufactured Home Park Rules (Chapter 3701-27 of the Ohio Administrative Code) require that all manufactured homes placed within a manufactured home park in a 100-year floodplain after November of 1992 must comply with stipulated blocking requirements. The rules also require that all manufactured homes placed in a manufactured home park after June 1, 1979, must secure the home with tiedowns in accordance with manufacturer's specifications.

### Severe Winter Storm

Existing mitigation activities relating to severe winter storm come in the form of preliminary notification and post-disaster response. Public information of an impending severe winter storm is provided by area news media affiliates and the National Oceanic and Atmospheric Administration (NOAA) weather radio system based on predictions from the National Weather Service.

As previously mentioned, the adverse effects of severe winter storms can also be reduced by mitigation procedures outlined in the Wood County EMA's *Emergency Operations and All Hazards Plan*.

## **Identification and Prioritization of Activities**

Given these existing mitigation components, the Mitigation Committee's efforts focused on the development of additional mitigation initiatives that would supplement those currently in place. These new or expanded activities serve as the basis for the creation of action plans that will be implemented as a part of the Wood County Mitigation Plan. Specific action plans are described in Section Five.

There were two informally established categories of mitigation initiatives that were reviewed by the Committee. One category included those activities considered to be general in nature. These were generated by the Mitigation Planning Committee itself and were approved through the consensus of the Committee. These general activities addressed the multi-hazard goals identified above as well as the general goals relating to tornado and flood hazards.

Definitive mitigation activities, also referred to as mitigation projects, were those submitted by many political subdivisions throughout the County. Consistent with the determinations from the Hazard Analysis, the majority of proposed projects submitted by the cities, villages, and townships were primarily directed toward tornado hazards. Several individual projects submitted were directed toward flood hazards.

As mentioned, mitigation activities developed to address multi-hazard and other general goals were determined by the Committee following their review of proposed initiatives. This method of selection was chosen due to the absence of financial, social, and environmental considerations. Conversely, individual mitigation activities/proposals submitted by County political subdivisions were selected using a formal evaluation as described below.

Prior to their formal evaluation and review, the Planning Committee requested specific mitigation proposals from all political subdivisions within the County. These requests came via established meetings with city administrators, village councils, and township trustees. A mitigation proposal form was developed and sent to representatives from each County political subdivision. Subsequent discussions with these representatives provided the appropriate mechanisms for the development and submission of individual proposals. Supportive information was encouraged to lend credence to the proposals during their assessment and evaluation by the Planning Committee.

Individual mitigation proposals submitted by the County political subdivisions were evaluated by the Committee using a tabled matrix. The matrix correlated four specific criteria: cost effectiveness, technically feasible, environmentally sound, and social impacts as shown below. Each specific activity was rated on a five-point scale as indicated.

|                       | <b>PROPOSED ACTIVITIES</b> |            |            |            |
|-----------------------|----------------------------|------------|------------|------------|
| <b>CRITERIA</b>       | Activity 1                 | Activity 2 | Activity 3 | Activity 4 |
| Cost Effective        |                            |            |            |            |
| Technically Feasible  |                            |            |            |            |
| Environmentally Sound |                            |            |            |            |
| Social Impacts        |                            |            |            |            |
| <b>Total</b>          |                            |            |            |            |

4 – Excellent  
 3 – Good  
 2 – Fair  
 1 – Poor  
 0 – Unacceptable

Where cost effectiveness was addressed, consideration was given not only to the availability of County funding sources (both incorporated and unincorporated areas), but also on the potential availability of outside sources of funding (State, federal, and other grant-based organizations).

Committee members evaluated the proposed projects by totaling their scores for each mitigation activity for flood and tornado. At a subsequent Mitigation Planning Committee meeting, the scores were compiled from the group to determine the mitigation activities for these two natural hazards. The mitigation activities selected are identified as a part of the Section Five.

## **Section Five: Mitigation Action Plans**

### **Action Plan Development**

The development of action plans is a final stage in setting the direction for the implementation of mitigation activities and the achievement of established goals. An action plan is a composite of a defined goal, mitigation activities identified to achieve the goal, and specific tasks directed to address the mitigation activities.

During a formal meeting of the Mitigation Committee, Action Plans were established that would serve as the guide for Wood County for the five-year implementation period of the Mitigation Plan. Proposed mitigation activities were discussed individually. Initial discussions centered on determining whether the individual projects warranted inclusion within the Plan. Those in question were considered using cost/benefit analysis and their applicability on mitigation as criteria.

Cost/benefit analysis compares the projected overall costs of the project with the benefits to community citizens, their properties, and their applicability to mitigation. This concept is reflected as well in the evaluation of mitigation projects using the “Cost-effective” parameter as described above. Cost/benefit analysis is an extremely useful tool when making determinations among a variety of projects; particularly where the protection of County residents and properties within the County are concerned. In making these analyses, several proposals were rejected by the Committee based on those parameters. Estimated costs of projects that will involve grant funding requests are included as a part of the Mitigation Proposal Status Sheets found in Appendix E.

### **Action Plans**

The Action Plans described below are those adopted by the Wood County Mitigation Planning Committee. The Action Plans include an identification of: the specific goals being addressed; the mitigation activity(ies) directed to accomplish each goal; the lead agency(ies)/individual(s) that will assist with the implementation of the particular activity; the projected timeline to complete the activity; and the specific tasks that will be conducted to fulfill the intended purpose of the goal.

The following Action Plans are established for multi-hazard goals and the goals identified specifically for tornado and flood.

### **Action Plans for Multi-Hazard Goals**

**Goal 1:** Enhance public information and educational programs for pre-disaster and post-disaster situations

**Activity 1:** Update and distribute, as necessary, existing public educational materials that relate to the mitigation of natural disasters to include references to the Wood County Mitigation Plan and public participation in the planning effort. These educational materials include safety and other relevant information specifically directed toward tornado safety tips, safe rooms as shelters, flood-damaged property, precautions during severe winter weather, and others

**Lead:** Director, Wood County Emergency Management Agency (WCEMA)

**Timeline:** January 2004 – June 2005

**Task 1:** Identify the existing types and distribution methods of natural disaster information

**Task 2:** Assess the current composition of educational information, updating as necessary, including the implementation of the Wood County Mitigation Plan

**Task 3:** Assess the strategies for dissemination of public information and modify, as necessary

**Task 4:** Identify any necessary sources of funding

**Task 5:** Implement enhanced public informational releases

**Activity 2:** Disseminate updated natural disaster mitigation educational materials to citizens residing within the following political subdivisions:

- City of Northwood
- City of Rossford
- City of Perrysburg
- Village of Milton Center
- Village of Custar
- Village of Hoytville
- Village of Bairdstown
- Village of Cygnet
- Village of West Millgrove
- Village of Luckey
- Village of Jerry City
- Village of Risingsun
- Village of Portage
- Village of Millbury
- Village of Grand Rapids
- Village of Walbridge

**Lead:** City/Village Mayors of relevant political subdivisions/ Director, WCEMA

**Timeline:** June 2004 – October 2005

**Task 1:** Identify existing types and distribution methods of natural disaster information within each of the aforementioned political subdivisions

**Task 2:** Assess the strategies for dissemination of public information and modify, as necessary

**Task 3:** Obtain necessary funding from the respective political subdivisions identified above

**Task 4:** Disseminate updated public informational releases on natural disaster mitigation

**Goal 2:** Strengthen existing partnerships among all public and private sectors within and beyond Wood County

**Activity:** Expand the understanding of existing partnerships to include knowledge of Wood County Mitigation planning; increasing the potentials for cooperative mitigation initiatives

**Lead:** Director, WCEMA

**Timeline:** January 2004 – June 2005

**Task 1:** Identify all existing and potential partnerships with federal, State, and local agencies/organizations/political subdivisions that have some involvement with the issue of natural disaster mitigation

**Task 2:** Develop strategies to expand those partnerships

**Task 3:** Initiate and maintain formed partnerships

**Goal 3:** Integrate, as necessary, mitigation components within existing Wood County plans whose provisions are influenced by the mitigation of natural disasters

**Activity:** Modify existing Wood County plans and integrate needed mitigation considerations

**Lead:** Director, Wood County Planning Commission/ Director, WCEMA

**Timeline:** January 2004 – January 2005

**Task 1:** Identify all pertinent plans for Wood County political subdivisions (both incorporated and unincorporated) where mitigation for natural disasters is, or could potentially be, a component

**Task 2:** Identify and contact primary planning constituents of selected Wood County planning efforts

**Task 3:** Cooperatively develop constructive mitigation language for proposed inclusion within applicable plans

**Task 4:** Submit formal proposals for additions of mitigation language within appropriate Wood County plans

**Task 5:** Establish and maintain cooperative relationships with relevant Wood County planning constituents per Goal 2



- Goal 4:** Solidify mitigation initiatives for critical facilities (schools, nursing homes, fire departments, law enforcement agencies, and hospitals) within Wood County
- Activity:** Improve natural disaster mitigation impacting Wood County critical facilities, as necessary
- Lead:** Director, WCEMA
- Timeline:** June 2004 – June 2006
- Task 1:** Identify all existing critical facilities within Wood County
- Task 2:** Determine existing mitigation initiatives within these facilities
- Task 3:** Identify potential mitigation initiatives within these facilities
- Task 4:** Initiate cooperative assessments of potential initiatives with applicable representatives of relevant critical facilities
- Task 5:** Assist pertinent critical facilities in the development and submission of formal mitigation projects
- Goal 5:** Ensure adequate electrical power is available to operate communications systems during response to natural disasters
- Activity:** Install fuel-powered electrical generators in the following locations:
- Village of North Baltimore
  - Village of Tontogany (including Washington Township)
  - Village of Bloomdale
  - Village of Haskins
- Lead:** Mayors of respective Villages/President, Washington Township Trustees/Director, WCEMA
- Timeline:** January 2004 – January 2006
- Task 1:** Identify most feasible location(s) for generator installation
- Task 2:** Obtain cost estimates relevant to the installation
- Task 3:** Identify potential sources of funding
- Task 4:** Assist in the development and submission of funding requests, as needed
- Goal 6:** Enhance the sheltering of citizens during a tornado or severe winter storm
- Activity 1:** Construct a basement area for a new Bradner Fire Department building to serve as a shelter for the community (contingent upon the construction of a new fire station)

**Lead:** Mayor, Village of Bradner/Bradner Fire Chief/ Director, WCEMA

**Timeline:** June 2004 – January 2008

**Task 1:** Conduct site assessments

**Task 2:** Arrange for and assist in plan development

**Task 2:** Obtain cost estimates through bid process

**Task 3:** Identify potential sources of funding

**Task 4:** Assist in the development and submission of funding requests, as needed

**Task 5:** Construct facility in conjunction with construction of the new fire station

## **Action Plans for Tornado Hazard Goals**

**Goal:** Enhance early warning systems to maximize public notification

**Activity:** Install new or upgraded tornado sirens with battery backup within the following political subdivisions:

- City of Bowling Green (4)
- Village of Weston (3)
- Village of North Baltimore (also for Henry Township)
- Village of Pemberville (also for Freedom Township)
- Village of Wayne
- Village of Bloomdale
- Village of Haskins
- Portage Township
- Weston Township (2)
- Troy Township
- Perrysburg Township (3)
- Jackson Township

**Lead:** Mayors of respective Villages/Presidents, respective Township Trustees/Director, WCEMA

**Timeline:** June 2004 – January 2007

**Task 1:** Identify most relevant location for siren installations

**Task 2:** Identify sources of potential funding

**Task 3:** Assist political subdivisions, as necessary, in the development and submission of funding requests

**Task 4:** Install warning sirens contingent upon available funding

## **Action Plans for Flood Hazard Goals**

**Goal 1:** Minimize flood losses to structures and properties within Wood County

**Activity 1:** Mitigate, as necessary, all repetitive loss structures within Wood County

**Lead:** Mayors of respective Villages/Presidents, respective Township Trustees/Director, WCEMA

**Timeline:** January 2004 – June 2006

**Task 1:** Identify all repetitive loss structures within Wood County

**Task 2:** Determine specific cause of flooding for each structure (watercourse, inadequate sewer capacity, etc.)

**Task 3:** Assess potential strategies for corrective action (property buy out/demolition of affected structures, relocation, watercourse cleaning, infrastructure improvements, etc.)

**Task 4:** Determine most appropriate corrective action for each repetitive loss structure

**Task 5:** Obtain applicable costs estimates for identified corrective actions

**Task 6:** Identify potential sources of funding

**Task 7:** Assist relevant political subdivisions in the acquisition of available funding, as needed

**Task 8:** Implement corrective measures

**Activity 2:** Mitigate, as necessary, repetitive flood-loss agricultural properties within Wood County

**Lead:** Presidents, relevant Township Trustees/Director, WCEMA/TMACOG

**Timeline:** June 2004 – June 2007

**Task 1:** Identify all repetitive flood-loss agricultural properties within Wood County

**Task 2:** Assess potential strategies for corrective action (ditch and stream restoration, tiling, diking, etc.)

**Task 3:** Determine most appropriate and cost-effective corrective actions for affected properties

**Task 4:** Obtain applicable costs estimates for identified corrective actions

**Task 5:** Identify potential sources of funding

**Task 6:** Assist relevant political subdivisions in the acquisition of available funding, as needed

**Task 7:** Implement corrective measures, as necessary

**Activity 3:** Obtain portable water dams for protecting downtown Pemberville

**Lead:** Mayor, Village of Pemberville/Director, WCEMA

**Timeline:** June 2004 – June 2006

**Task 1:** Assess areas of need within the Village

**Task 2:** Determine appropriate quantity of portable dams needed

**Task 2:** Obtain cost estimates

**Task 3:** Identify potential sources of funding

**Task 4:** Assist the Village in the acquisition of available funding, as needed

**Activity 4:** Relocate Grand Rapids Township Fire Department out of Maumee River floodplain

**Lead:** President, Grand Rapids Township Trustees/Grand Rapids Township Fire Chief

**Timeline:** June 2004 – June 2007

**Task 1:** Conduct site assessments on potential properties for relocation

**Task 2:** Identify sources of funding for property purchase and costs of installation, as necessary

**Task 3:** Arrange for and assist in plan development

**Task 4:** Obtain cost estimates for facility construction through bid process

**Task 5:** Assist in the development and submission of funding requests, as needed

**Task 6:** Construct facility

The subsequent phase of finalizing the Action Plan section was to prioritize those activities that would direct the implementation of specific activities. Committee members again divided the activities into two categories – general and specific. General goals that were initially presented and approved were given high priority. Proposals relating to specific activities within individual political subdivisions were grouped by type (tornado warning devices, generators, educational information dissemination, etc.) to determine relative priority. Those groupings were prioritized using the evaluations described above as well as by cost/benefit criteria. Higher priority was given to the installation of tornado warning devices and obtaining gas-powered generators. The two proposals relating to flood (Pemberville and Grand Rapids Township)

were given moderate priority with the dissemination of updated educational information and the construction of a basement shelter area for a new Bradner Fire Department building given a lower priority.

The Mitigation Committee also decided that, regardless of priority considerations, activities would be pursued concurrently.

During the extent of the five-year implementation period of the Mitigation Plan, there will indeed be other proposed mitigation activities that Mitigation Committee will need to consider. Proposals for additions or modifications to the Action Plan section may result from conditions noted during a particular task(s) performed in conjunction with a specific mitigation activity. Modifications or additions may also be prompted by public responses as a part of their ongoing opportunities to participate in the mitigation planning and implementation process. The Mitigation Committee will evaluate proposed modifications to the Action Plan section and determine their viability for inclusion by using the procedures described in Section Four. Incorporation of any additions or changes to the Plan is also discussed in the Plan Maintenance component of Section Seven.

## **Section Six: Community Participation**

### **Overview**

Community involvement in the planning and implementation of mitigation initiatives is crucial and must be a continual process. The success of the Wood County Mitigation Plan is contingent upon this premise. It is the obligation of the Planning Committee to inform the community of the Plan's purpose and to consider all public input during the entirety of Plan implementation. The Wood County Mitigation Plan functions as a means to address community issues and concerns as they relate to the mitigation of natural disasters for it is toward their protection and the protection of their properties that this Mitigation Plan is directed.

### **Initial Notification**

Initial notification of the public was accomplished by releases through news media sources, discussions with community groups by Committee representatives, and through formal meetings with community leaders representing the general populace.

Information presented during these formal and informal notifications centered on the development and passage of the federal Mitigation Act of 2000 and the parameters established by that legislation. Descriptions were provided on the underlying purpose of the Act and how the County, through an established Mitigation Planning Committee, would achieve the goals outlined within the Act.

### **Preliminary and Continued Involvement**

During the developmental stages and eventual completion of the Hazard Analysis Section of the Wood County Mitigation Plan, public responses were received that provided needed historical data of natural disaster occurrences within the County. These necessary data were obtained from County citizens, community leaders, and others knowledgeable of past natural disasters and their personal and financial impacts upon the County.

Continued public participation efforts will come in several forms. First of all, public input was requested following the completion of the draft Plan. Through various news media sources, Wood County citizens were apprised of the progress of the Plan as well as being informed of ways to view the draft Plan. Hardcopy versions of the draft Plan were made available for public viewing in the Office of the Wood County Emergency Management Agency as well as in several other government offices in strategic locations throughout the County. Once the final Plan has been accepted by FEMA, copies of the approved Plan will be maintained in these locations for review by the public. As a part of this hardcopy review process, instructions will be provided to citizens who wish to comment or make suggestions on Plan components.

Secondly, citizens, using Mitigation Planning Committee members as points of contact, are also afforded the opportunity to receive digitized copies of the draft Plan via e-mail attachments. They may also print out the draft Plan, if desired. This resource will be made available on a continual basis, once the

draft Plan has been submitted for review and following the approval of the final Plan. Periodic news releases and other community educational efforts, as referenced in Section Five, will continually provide citizens the opportunity to review the Plan and provide comment.

A more formal means of gathering input from the general populace came in the form of an established Open House. The Open House, which was held in mid-November, provided an occasion for citizens to meet some of the Mitigation Planning Committee members, review available hard copies of the draft Plan, and hear informal presentations by Committee members on the overall concepts and processes involved in the mitigation of natural disasters. The public was informed on how they can participate in the process by their reviewing the Plan and providing constructive assessments of any Plan component. They were also afforded the opportunity to ask questions about the Plan and the planning process.

An ongoing method of providing information to County citizens will be the development and continued updating of a web page. This web site will be included as a component of the Wood County Emergency Management Agency web page. Maintaining and updating of the web page will be the responsibility of the Wood County EMA in conjunction with the Wood County Mitigation Planning Committee. The web site will allow for the viewing any printing of any section of the Plan. It will also provide a means for individuals to comment on the content of the Plan. A questionnaire will be included that will allow the completed form to be submitted to the Director of the Wood County Emergency Management Agency. As necessary, responses from the web-based questionnaire will be provided to the Mitigation Planning Committee for their consideration and response.

It is through these mechanisms of continued public involvement that Wood County citizens will be afforded the most effective mitigation initiatives that will protect them and their properties from the impacts of natural disasters.

## **Section Seven: Plan Development, Adoption, Distribution, Implementation, and Maintenance**

### **Overview**

Prior to initiating the mitigation activities designed within the Plan, formal adoption by those County entities served by the Plan must be accomplished. Adoption of the Plan by the political subdivisions within the County, demonstrates their commitment toward the implementation of currently proposed and future mitigation initiatives.

Continued updating of any formal plan is vital to achieving established goals. Without periodic reviews, the entire effort loses its effectiveness and jeopardizes the fulfilling the overall purpose of the Plan. The Wood County Mitigation Plan is, and will continue to be, a working Plan. Under the time frame outlined by FEMA in the Mitigation Act of 2000, the plan implementation period was set at five years. Within that period of time, additions and revisions must be expected. In order for this Plan to succeed, systematic maintenance will be necessary.

The timeframe for the development of the Wood County Mitigation Plan for Natural Disasters spanned 11 months. This period extends from obtaining data for the Hazard Analysis Section to the submission of the final report.

The following presents the methods by which the Wood County Mitigation Plan was developed and how it will be adopted, distributed, implemented, and maintained.

### **Plan Development**

Throughout the course Mitigation Plan development, Planning Committee members, interested County citizens, and representatives from State and local organizations and agencies took the opportunity to become involved, either directly or indirectly, in the formation of the finished Plan. The Wood County Mitigation Plan could not have been completed successfully without the diligent efforts of these concerned individuals. Committee members, representing a wide variety of governmental, academic, and other public and private entities provided needed information and data to produce this valuable document.

The Planning Committee met during formal committee meetings, and discussed specific issues through computer-generated messages, telephone conversations, and informal one-on-one discussions. Information obtained during these activities was shared with all Committee members to gain consensus of all decisions regarding Plan development.

As indicated throughout the Plan, citizens were availed many opportunities to express their views and concerns relating to provisions outlined in the Plan. Individuals representing State and local organizations, agencies, and academia, such as the Ohio Emergency Management Agency, the Ohio Department of Natural Resources, Bowling Green State University, and the National Weather Service, provided valuable information and data needed to address particular planning issues.



It is the compilation of all these voluntary efforts that have resulted in the completion of the Wood County Mitigation Plan for Natural Disasters – a Plan that will benefit the entirety of Wood County and the citizens who reside within and adjacent to its boundaries. Descriptions of how the plan was developed are found in the monthly and quarterly reports submitted to the Ohio Emergency Management Agency. Copies of the monthly and quarterly reports can be found in Appendix D.

## **Plan Adoption**

During the course of this mitigation planning effort, each political subdivision has been given the opportunity to participate in all phases of Plan development as described in Section Two. Plan adoption completes this portion of their commitment to mitigate natural disasters.

Formal adoption of the Wood County Mitigation Plan will occur following the completion of the draft Plan. Formal adoption will come in the form of either resolution or ordinance, depending upon the requirements of the political subdivision in question.

The governing bodies of all political subdivisions identified as a part of the Plan were provided copies of the draft Plan for their review. Representing the political subdivisions effected were the Wood County Commissioners and the city and village councils of the four cities and 21 villages within the County.

Representatives of the Mitigation Planning Committee solicited the support and full adoption of the Plan by direct contact with the Wood County Commissioners and the Mayors/Administrators of County cities and villages. This contact served to solidify understanding of their responsibilities under the mitigation planning process. It also allowed for any final questions or concerns relating to the provisions outlined in the Plan.

To assist in the timely Plan approvals by the affected political subdivisions, the Committee requested that formal consideration of Plan approval be placed on the meeting agendas of relevant political subdivisions during the months of November and December, 2003. This schedule would allow for the distribution of the draft Plan and the review by the respective political subdivisions prior to their December meeting. The scheduling for final adoption of the Plan by individual political subdivision governing bodies will vary. It is anticipated that some political subdivisions will adopt the Plan as an emergency measure; while others will pursue the full course of three separate readings.

Once the individual approvals are completed, copies of the resolutions will be submitted to the Mitigation Planning Committee and maintained as a part of the Mitigation Plan within Appendix A. Copies of the resolutions will also be forwarded to the Ohio Emergency Management Agency for their files.

## **Plan Distribution**

The final version of the Wood County Mitigation Plan for Natural Disasters will be disseminated following the formal approval of the Federal Emergency Management Agency. Plan distribution, initially as well as any subsequent modifications of the Plan, will be the responsibility of the Wood County Emergency Management Agency.

Mitigation Plans will be submitted to the following entities:

- Wood County Commissioners
- All Wood County Political Subdivisions
- Wood County Emergency Management Agency
- All Members – Wood County Mitigation Planning Committee
- Wood County Health Department
- Ohio Emergency Management Agency
- Wood County Planning Commission
- Wood County Engineer
- Wood County Building/Zoning Department
- Wood County Water/Sewer Department
- Wood County Library
- Others as requested

## **Plan Implementation**

The Wood County Mitigation Plan for Natural Disasters will be implemented according to the Action Plans established in Section Five. Responsibility of overseeing the execution of the Action Plans will be a cooperative effort among the Wood County Emergency Management Agency, The Wood County Mitigation Planning Committee, and the various public and private entities identified within the Action Plan Section. The Mitigation Planning Committee will be kept informed of progress of implementation activities through formal and informal contacts by the Wood County Emergency Management Agency. Completion of specific mitigation activities will be documented within the Plan as indicated below.

## **Plan Maintenance**

Periodically, throughout the five-year implementation period of the Wood County Mitigation Plan, additions and other modifications will need to be incorporated within the Plan. These changes include names of individuals who may be added to or removed from membership on the Mitigation Planning Committee, modifications and completion dates of specific mitigation activities, and any other alterations that will maintain the Plan current. The status and completion dates of current mitigation projects are updated on a Mitigation Project Status Sheets which are provided in Appendix E. As modifications are made, information to that effect will be provided to Planning Committee members. Updated information to previously distributed copies of the Plan will follow procedures as described within this Section.

Plan alterations, other than those considered insignificant, will be reviewed and approved by the Planning Committee prior to being added to or eliminated from the Plan. Proposed changes to the Plan can be made by any Committee member. Suggestions for Plan modification by Wood County citizens or other individuals not a part of the Planning Committee may be routed through a Planning Committee member or through the governing body of their respective political subdivision. If warranted, the Planning Committee may request clarification or further explanation of the proposal by the individual(s) submitting the modification. Proposed changes will be reviewed by the Committee and accepted only upon their consensus. All approved changes will be incorporated within the web version of the Plan as soon as practical. Changes to the hardcopy versions will be disseminated to those entities identified in the distribution list given above. Modifications will also be sent to all Committee members for inclusion within their respective Plans.

The Wood County Mitigation Planning Committee will formally evaluate the Wood County Plan on an annual basis; prior to the yearly anniversary of its approval by FEMA. At that time, any changes made to the Plan will be included within the hardcopy versions of the Plan distributed throughout the County. All changes will also be sent to the Ohio Emergency Management Agency for their files.