# Hardee County Multi-hazard Local Mitigation Strategy

★ City of Bowling Green ★ City of Wauchula ★
★ Town of Zolfo Springs ★ Hardee County ★

**Initially Adopted October 1999**
**2015 Final Plan ~ FEMA Approved**

# Executive Summary

The purpose of the Local Mitigation Strategy (LMS) is to identify risks and corresponding mitigation actions to reduce the human, environmental, and economic costs of disasters. These objectives can be achieved through hazard mitigation or any actions taken by local governments, other government entities, or private interests to permanently reduce or eliminate long-term risks to people and their property from the effects of natural or manmade disasters.

The process of creating the LMS involved identifying hazards that could impact the county, assessing the county's vulnerability to each of those hazards, identifying actions that would mitigate the impact from each of those hazards, and establishing a method for implementation. This document, the *Hardee County Local Mitigation Strategy*, identifies specific steps to be taken to reduce the impacts of various natural and manmade hazards, the timing of those steps, potential funding sources, their priority within the community, and the entities responsible for implementing each of them.

The LMS is an important document for a number of reasons. It has been documented that communities who implement disaster mitigation planning techniques and strategies receive more state and federal relief funds in the aftermath of a disaster, and receive these funds more quickly, than communities who do not. Other benefits of a local mitigation strategy include:

- Increased safety of lives and property by reducing the community's vulnerability to disasters.
- Financial savings from reduced cost of recovery and reconstruction after a disaster strikes.
- Shared resources through improved county and city partnerships.
- The ability to focus resources on hazard-prone, highly vulnerable areas of the county and cities where those resources will have the greatest positive impact.
- A strengthened community through the joint development and implementation of mitigation actions.
- Improved post-disaster decision-making.
- A more educated and informed community regarding disaster and disaster mitigation issues.
- Provision of a public forum to discuss and deliberate community goals and future actions.

Cover Image: The image on the cover page is the winning entry of the Hardee County Office of Emergency Management's Hazardous Weather Awareness Poster Contest. The poster was created by a local third-grader after learning about natural disasters and their impacts on our community.

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# Prerequisites

*44 CFR 201.6(c)5: The local hazard mitigation plan shall include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan. For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.*

After receiving notification of "Approval Pending Adoption," the final draft of this plan will be submitted to the county and each municipality for adoption. The following pages are reserved as placeholders for the adoption resolutions.

# Hardee County Resolution to Adopt

## RESOLUTION 2015-15

**WHEREAS,** Hardee County, a Political subdivision of the State of Florida, has been directed by the Florida Legislature to maintain a ***Hardee County Local Mitigation Strategy*** to be in accord with Florida and Federal requirements; and

**WHEREAS,** Hardee County has complied with the directive, and formulated a ***Hardee County Local Mitigation Strategy***; and

**WHEREAS,** the Board of County Commissioners has reviewed the 2015 update of the ***Local Mitigation Strategy*** and is in accord with its content.; and

**NOW, THEREFORE,** be it resolved that the ***Hardee County Local Mitigation Strategy*** shall govern mitigation operations in Hardee County and that all such operations shall be in accord with the policies state therein; and

**BE IT FURTHER RESOLVED** that it be so noted in the minutes of this assembly of the Board of County Commissioners of Hardee County, Florida the 2nd day of April A.D., 2015, and

**BE IT FURTHER RESOLVED** that this Resolution also be included in the ***Hardee County Local Mitigation Strategy.***

**ADOPTED** THIS 2nd day of April A.D., 2015

04-02-15P02:24 RCVD

Mike Thompson, Chairman
Hardee County Board of County Commissioners

BOARD OF COUNTY COMMISSIONERS

Victoria L. Rogers 04/06/2015

**Victoria L. Rogers, Ex-Officio Clerk**
**Board of County Commissioners**

STATE OF FLORIDA
COUNTY OF HARDEE
THIS IS TO CERTIFY THAT THE FOREGOING IS A TRUE AND CORRECT COPY OF Resolution 2015-15

AS ADOPTED BY THE BOARD OF COUNTY COMMISSIONERS OF HARDEE COUNTY THE 2 DAY OF April 20 15
WITNESS MY HAND AND OFFICIAL SEAL THIS 6 DAY OF April 20 15.
VICTORIA L. ROGERS, CLERK OF CIRCUIT COURT
BY: [illegible] D.C.

# City of Wauchula Resolution to Adopt

**RESOLUTION NO. 2015-10**

**A RESOLUTION OF THE CITY COMMISSION OF THE CITY OF WAUCHULA, FLORIDA, PROVIDING FOR APPROVAL OF 2015 UPDATE OF THE HARDEE COUNTY, FLORIDA LOCAL HAZARD MITIGATION STRATEGY; PROVIDING FOR INCLUSION OF THIS RESOLUTION IN SAID STRATEGY; AND PROVIDING FOR AN EFFECTIVE DATE.**

**WHEREAS,** on or about September 01, 1998, the City Council of the City of Wauchula, Florida, a municipal corporation organized and existing under the laws of the State of Florida, entered into an Interlocal Agreement with Hardee County, Florida, the City of Bowling Green, Florida, the Town of Zolfo Springs, Florida, to comply with a directive of the Federal Department of Energy and Federal Energy Management Agency through the Florida Department of Community Affairs to prepare a local Hazard Mitigation Strategy as part of the Statewide Hazard Mitigation Strategy; and

**WHEREAS,** the City of Wauchula, together with Hardee County, the City of Bowling Green, and the Town of Zolfo Springs, complied with the directive and formulated the Hardee County, Florida, Local Hazard Mitigation Strategy; and

**WHEREAS,** the City Commission of the City of Wauchula, Florida, reviewed the 2015 update of the Hardee County, Florida, Local Hazard Mitigation Strategy and is in accord with its contents.

**NOW, THEREFORE BE IT RESOLVED, BY THE CITY COMMISSION OF THE CITY OF WAUCHULA, FLORIDA:**

1. That the 2015 update of the Hardee County, Florida, Local Hazard Mitigation Strategy is approved.

2. That the Hardee County, Florida, Local Hazard Mitigation Strategy shall govern all hazard mitigation operations in the City of Wauchula, and all such operations shall be in accordance with the policies stated therein.

3. That this Resolution shall take effect immediately upon its approval.

**On motion of Commissioner Lambert, seconded by Commissioner Preston the above Resolution was approved by the City Commission of the City of Wauchula, Florida, this 13th, day of April, 2015.**

CITY OF WAUCHULA:

By: _____
Richard K. Nadaskay Jr.
Mayor

ATTEST:

_____
Holly Smith, CMC
City Clerk

(Seal)

APPROVED AS TO FORM:

By: _____
Thomas A. Cloud
City Attorney

# City of Bowling Green Resolution to Adopt

## RESOLUTION 2015-01

**A RESOLUTION AGREEING THAT THE HARDEE COUNTY LOCAL MITIGATION STRATEGY SHALL GOVERN MITIGATION OPERATIONS IN THE CITY OF BOWLING GREEN IN ACCORDANCE WITH THE POLICIES STATED THEREIN; PROVIDING AN EFFECTIVE DATE.**

**WHEREAS,** Hardee County, a Political subdivision of the State of Florida, has been directed by the Florida Legislature to maintain a ***Hardee County Local Mitigation Strategy*** to be in accord with Florida and Federal requirements; and

**WHEREAS,** Hardee County has complied with the directive, and formulated a ***Hardee County Local Mitigation Strategy***; and

**WHEREAS,** the Board of City Commissioners for Bowling Green, Florida, has reviewed the 2015 update of the ***Local Mitigation Strategy*** and is in accord with its content; and

**NOW, THEREFORE,** be it resolved by the Bowling Green City Commission that the ***Hardee County Local Mitigation Strategy*** shall govern mitigation operations in the City of Bowling Green, Florida, and that all such operations shall be in accord with the policies state therein; and

**BE IT FURTHER RESOLVED** that it be so noted in the minutes of this assembly of the Board of City Commissioners of Bowling Green, Florida this 14 day of April A.D., 2015, and

**BE IT FURTHER RESOLVED** that this Resolution also be included in the ***Hardee County Local Mitigation Strategy.***

**ADOPTED** THIS 14 day of April A.D., 2015

CITY OF BOWLING GREEN

Mary Alice Tucker

Mary Alice Tucker, Mayor
Bowling Green, Florida

**ATTEST:**

Maria Carmen Silva
City Clerk

**APPROVED AS TO FORM:**

Gerald T. Buhr
City Attorney

# Town of Zolfo Springs Resolution to Adopt

## RESOLUTION 2015-04

**WHEREAS,** Hardee County, a Political subdivision of the State of Florida, has been directed by the Florida Legislature to maintain a ***Hardee County Local Mitigation Strategy*** to be in accord with Florida and Federal requirements; and

**WHEREAS,** Hardee County has complied with the directive, and formulated a ***Hardee County Local Mitigation Strategy***; and

**WHEREAS,** the Town Commission of Zolfo Springs, Florida, has reviewed the 2015 update of the ***Local Mitigation Strategy*** and is in accord with its content; and

**NOW, THEREFORE,** be it resolved by the Town Commission of Zolfo Springs that the ***Hardee County Local Mitigation Strategy*** shall govern mitigation operations in the Town of Zolfo Springs, Florida, and that all such operations shall be in accord with the policies state therein; and

**BE IT FURTHER RESOLVED** that it be so noted in the minutes of this assembly of the Town Commission of Zolfo Springs, Florida this 20th day of April A.D., 2015, and

**BE IT FURTHER RESOLVED** that this Resolution also be included in the ***Hardee County Local Mitigation Strategy.***

**ADOPTED THIS** 20th day of April A.D., 2015

Juan Otero, Mayor
Town Commission of Zolfo Springs, Florida

**ATTEST:**

Amanda Gibson
Town Clerk

**APPROVED AS TO FORM:**

Gerald T. Buhr
Town Attorney

# Section 1. Planning Process

*44 CFR 201.6(b): An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:*

*(1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;*

*(2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and*

*(3) Review and incorporation, if appropriate, of existing plans, studies, reports and technical information.*

### Planning Process

Hardee County first adopted a Local Mitigation Strategy in October 1999. In compliance with the Disaster Mitigation Act of 2000, Hardee County and its three incorporated municipalities together established the revised *Hardee County Local Mitigation Strategy* (LMS) that was adopted by each jurisdiction in April 2010. The LMS has been designed to be a process-oriented document with policies for review and revision allowing the county to meet new and ever-changing conditions. Those conditions stem from a number of factors: natural and man-made hazard events, perceived local needs, funding opportunities, and planning requirements, to name a few. To do this, the original plan laid out steps for reviewing and revising the plan. Specifically, the plan was to be informally evaluated on an annual basis with a formal evaluation every five years.

According to 44 CFR 201.6(d), plans must be reviewed, revised if appropriate, and resubmitted for approval within five years for continued eligibility for certain hazard mitigation assistance programs such as the Pre-Disaster Mitigation, Flood Mitigation Assistance, Severe Repetitive Loss, and Hazard Mitigation Grant Programs. In accordance with these requirements and the review schedule determined by the LMS Working Group (required under F.A.C. 27P-22), an informal review of the LMS was conducted annually and revisions were submitted to the Florida Division of Emergency Management as necessary. In addition, a large-scale, five-year update began in June 2014 by Hardee County Emergency Management. This process involved the identification of additional hazards, updates to the risk assessment using more recent data, and evaluating existing mitigation goals, projects, and program for overall effectiveness. This plan includes a plan maintenance section based on the review and revision criteria found in the 2010 LMS. The content of this section is largely the same as the 2010 LMS although the formatting and title were updated. It was determined the plan should more closely follow FEMA's 2014 Crosswalk and the associated planning guidance.

First, a current list of hazards that have impacted or could impact the county was generated. Using the 2010 LMS hazard profile and other data gathered from various resources, a current profile of hazards and risk assessment were generated for each of the jurisdictions. This updated plan uses the best and most current available data that has been gathered from the Hardee County Property Appraiser, the Central Florida Regional Planning Council, the Southwest Florida Water Management District, the Florida Division of Emergency Management, the Federal Emergency Management Agency, the Florida Fish and Wildlife Conservation Commission, the Federal Communications Commission, U.S. Census Bureau, the University of Florida's Bureau of Economic and Business Research, the Florida Natural Areas Inventory, the Florida Forest Service,

the Florida Department of Health, the National Climatic Data Center, and other related organizations.

Once the task of updating the risk assessment was completed, the LMS Working Group, a committee of designated local representatives, and the public convened on October 6, 2014, to review the updated information and discuss the mitigation strategy. The LMS Working Group is comprised of local stakeholders and representatives from each jurisdiction within the county. Members include representatives from Emergency Management, Public Works, Utilities, drainage providers, transportation providers, major employers and businesses, local municipalities, other county government, and the School Board. A list of LMS Working Group members is provided in the Appendix along with a copy of the e-mail sent to the Working Group announcing the October 6th meeting. This particular meeting was held in the Hardee County Emergency Operations Center and was led by the County Emergency Management Program Manager.

After the October 6th meeting, county staff compiled comments and suggestions to incorporate into the plan. Revisions and updates continued to be made by county staff until a final draft was created. The final draft will be posted on the county website for public comment and will also be available for comment at the adoption hearings for each jurisdiction.

Each jurisdiction within the county has continued their participation in the LMS since its adoption in 2010. Representatives from each of jurisdiction came to various Working Group meetings and provided valuable input for identifying and prioritizing mitigation actions. Since the adoption of the LMS in 2010, no new jurisdictions have been formed within the county. Those participating jurisdictions are:

- Hardee County (unincorporated)
- City of Wauchula
- City of Bowling Green
- Town of Zolfo Springs

### Public and Private-Sector Participation

Throughout the planning process, public and private-sector involvement was encouraged. Meetings of the LMS Working Group were held almost quarterly. These meetings are open to the public and are generally advertised through notices placed at the County Courthouse and mass e-mailings.

During the plan update, specifically, the public was invited to attend a meeting on October 06, 2014 to review the county risk assessment and the current mitigation strategy (goals, objectives, and mitigation actions). The public was provided information on identified hazards and vulnerabilities and was given the opportunity to suggest future mitigation projects. As mentioned in the previous section, notification of this particular meeting was posted at the county Courthouse in two locations and a mass-email was sent to local stakeholders.

Upon receiving "Approval Pending Adoption" from FEMA, the public will be given opportunity to comment on the final draft of the LMS prior to its adoption by each local jurisdiction. The final draft will be posted on the county website prior to the adoption hearing allowing interested parties to review and comment on the plan.

In addition to public notices for each meeting, an effort was made to involve various stakeholders from within the county and the surrounding region. Various neighboring counties, local and regional agencies, businesses, academia, private organizations, and non-profits were invited to attend.

### Review of Existing Plans and Information

A preliminary review of existing plans, reports, and information was conducted during the initial phases of the update process. Specific to identifying and measuring existing mitigation-related activities, the following local plans were reviewed for their overall effectiveness at regulating or restricting development in hazard-prone areas, protecting environmental features that naturally mitigate impacts of disasters, requiring actions to reduce future vulnerability, facilitating orderly recovery and redevelopment, and/or optimizing the use of local and regional resources for hazard mitigation.

- Hardee County Comprehensive Plan
- Hardee County Comprehensive Emergency Management Plan
- Hardee County Unified Land Development Code
- City of Bowling Green Comprehensive Plan
- City of Bowling Green Land Development Regulations
- City of Wauchula Comprehensive Plan
- City of Wauchula Land Development Regulations
- Town of Zolfo Springs Comprehensive Plan
- Town of Zolfo Springs Land Development Regulations
- Hardee County Communitywide Wildfire Protection Plan
- Hardee County Debris Management Plan

To better understand the county's vulnerability to natural disasters, a comprehensive review of relevant information and reports was conducted. The following list of sources provided information on previous disaster occurrences, hazard analyses, housing data, agricultural information, economic information, demographic statistics, and other pertinent facts specific to Hardee County.

- Florida's State Hazard Mitigation Plan (SHMP)
- Florida Department of Community Affairs Report on Integrating Hazard Mitigation into Comprehensive Planning – Hardee County Profile
- Southwest Florida Water Management District's Hardee County Flood Map Modernization Outreach Plan
- U.S. Department of Agriculture, Florida Agricultural Statistics Service's Census of Agriculture 2002 and 2007
- U.S. Census Bureau 2010 Census
- Florida Housing Data Clearinghouse – Hardee Profile
- Federal Crop Insurance Corporation Hardee County Crop Statistics Summary
- Florida Geological Survey information
- National Climatic Data Center storm reports
- Various newspaper articles

All of the above listed plans, reports, and data sources were incorporated into the updated LMS. These sources allowed county staff to measure existing mitigation-related activities already in place within the County, identify additional hazards, understand the community's existing vulnerability, predict future impacts, and establish a strategy to mitigate those impacts.

# Section 2. Risk Assessment

*44 CFR 201.6(c)2: The plan shall include a risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards. The risk assessment shall include:*

*(i) A description of the type, location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.*

*(ii) A description of the jurisdiction's vulnerability to those hazards. This description shall include an overall summary of each hazard and its impact on the community.*

*(iii) For multi-jurisdictional plans, the risk assessment section must assess each jurisdiction's risk where they vary from the risks facing the entire planning area.*

## Background

Hardee County is located in the west central portion of the Florida peninsula. At the time of the 2010 census, the population of Hardee County was 27,731. Total land area is 638 square miles or 408,472 acres. Very rural compared to the states nearby coastal counties, the average density of the county is approximately 1 person per 14.6 acres.

**Table 2.1 Hardee County Jurisdictions**

| | Acreage | Percent of Total | 2010 Population | Percent of Total | 2000 Pop. Estimate | Percent of Total |
|---|---|---|---|---|---|---|
| City of Wauchula | 2,049 | 0.5% | 14,689 | 16.2% | 4,368 | 16.2% |
| City of Bowling Green | 801 | 0.2% | 5,069 | 10.7% | 2,892 | 10.7% |
| Town of Zolfo Springs | 1,116 | 0.3% | 7,973 | 6.1% | 1,641 | 6.1% |
| Unincorporated | 404,506 | | | | 18,037 | 67.0% |
| TOTAL | 408,472 | 100.0% | 27,731 | 100.0% | 26,938 | 100.0% |

*Sources: US Census Bureau, 2010*

In addition to being very rural, the county is one of the poorest in the state with an estimated 21 percent of individuals and 17 percent of families living below the poverty level. The median household income (in 2010 inflation-adjusted dollars) is $36,115 – almost one-third less than the national average. In addition, the county has low educational attainment rates, with only 60 percent of individuals aged 25 or older reporting having graduated from high school and only 7 percent having earned a bachelor's degree or higher (US Census Bureau, 2010 Estimates). Designated by the state as a part of the South Central Rural Area of Critical Economic Concern (RACEC), the local economy is largely rooted in the agricultural and mining sectors. Construction and education are large employment sectors within the area, as well. The tables below summarize the county's potentially vulnerable populations and agricultural operations.

| Table 2.2 Vulnerable Populations in Hardee County | | |
|---|---|---|
| **Population Group** | **Number** | **Percent of Population** |
| | | |
| 65 or older | 3,575 | 12.9% |
| Disabled (age 5 or older) | 3,099 | 11.1% |
| Minority or multi-racial | 7,718 | 19.4% |
| Individuals below poverty level | 7,587 | 29.7% |
| Living in mobile homes | 8,152 | 29.4% |
| Speak language other than English at home | 11,175 | 40.3% |
| Living in homes built prior to 1970 | 8,679 | 31.3% |
| Living in group homes (not including prisons or jails) | 58 | 0.21% |

*Sources: US Census Bureau, 2010 Census and American Community Survey*

| Table 2.3 Hardee County Agricultural Statistics | |
|---|---|
| **Acreage in Farms** | |
| Cropland | 51,767 |
| Irrigated Cropland | 36,038 |
| Pastureland | 254,577 |
| **Acreage in Citrus Fruits** | |
| Citrus | 47,069 |
| Grapefruit | 360 |
| Oranges | 45,855 |
| Specialty Fruits | 854 |
| **Acreage in Vegetables** | |
| Harvested | 3,330 |
| **Acreage in Outdoor Nurseries** | |
| Sod | 1,286 |
| **Heads of Livestock** | |
| All cattle and calves | 83,000 |
| Beef cows | 45,000 |
| Milk cows | 12,200 |

*Sources: USDA Census of Agriculture; Hardee County Property Appraiser*

Besides being known for abundant citrus groves and pastures, the county is located in an area that is known for its desirable climate. The county generally experiences mild winters and hot, humid summers. While the climate lends itself to an extended growing season, the types of

crops grown in the area are sensitive to occasional extreme temperatures. Climate statistics for Hardee County are provided in the table below.

| Table 2.4 County Climate Averages | | |
|---|---|---|
| **Month** | **Mean Monthly Temp (F)** | **Mean Monthly Precipitation (Inches)** |
| January | 61.6 | 2.04 |
| February | 63.9 | 2.71 |
| March | 67.4 | 3.79 |
| April | 71.7 | 2.74 |
| May | 77.8 | 3.09 |
| June | 82.1 | 8.07 |
| July | 83.3 | 7.94 |
| August | 83.7 | 7.80 |
| September | 82.1 | 6.09 |
| October | 76.7 | 2.64 |
| November | 69.5 | 2.14 |
| December | 63.7 | 2.15 |
| ANNUAL | 73.63 | 4.27 |
| Average Annual Days Max. Temperature > = 90F = 133.6 | | |
| Average Annual Days Min. Temperature < = 32F = 4.0 | | |
| Average Annual Rainfall = 51.2" | | |

*Source: http://www.flaheartland.com/hardee.htm*

Together, the statistics provided in this section indicate that Hardee County generally has large at-risk populations that, combined with the county's economic situation and location on the Florida peninsula, make local residents and their property highly vulnerable to the impacts caused by natural and man-made disasters. The method for identifying which types of hazards that may impact the county is provided below. Following that, there is a detailed description of the identified hazards and an analysis of the county's vulnerability to each of them.

### Hazard Identification

To begin to quantify Hardee County's risk to natural hazards, a process was needed for identifying which hazards have impacted or could impact the county. This process began with the review of relevant plans and data, such as the State of Florida's Hazard Mitigation Plan and previous versions of the Hardee LMS. Florida's State Hazard Mitigation Plan has identified the risk of the following hazards to Hardee County: floods, hurricanes, tornadoes, wildfires, extreme heat, winter storms, freezes, erosion, and sinkholes. The 2010 Hardee LMS identified floods, hurricanes, tornadoes, severe thunderstorms, freezes, hail, wildfire, and sinkholes, as well as various societal and technological disasters, as potential hazards that may impact the county.

Many other hazards were initially eliminated from the scope of this LMS update because of Hardee County's location, climate, and/or topography or because of current conditions. Those hazards that are not likely to ever occur within the county include avalanches, coastal erosion, coastal storms, earthquakes, expansive soils, landslides, tsunamis, and volcanoes. Dam and levee failures will be addressed in this update as the LMS Committee deemed them an applicable hazard.

For those hazards that are included in this plan update, they have been reviewed and re-categorized to reflect a more accurate depiction of the county's risk. For example, the technological hazards identified in the 2010 LMS have not been included in this plan update. In the 2010 LMS, technological hazards included hazardous materials release, mine wastewater spills, potable water system failure, communications failure, hazardous material commodity flow, mass transit crash, wastewater system failure, and power failure. It was determined that these items are generally the resulting impact of other natural hazards and therefore will not be discussed as separate hazards in this plan update.

Also, drought and extreme heat are now included in the LMS plan. Although not identified in the 2010 LMS as a hazard to Hardee County, droughts and extreme heat have been known to impact the county. Droughts have historically impacted the county in the form of water use restrictions for local residents. For the county's large agricultural sector, droughts cause growers to spend more money to fuel pumps during times of abnormally low rainfall. Drought can also be accompanied by extreme heat. Hardee County's location and climate make it susceptible to high temperatures potentially impacting its elderly and outdoor-working populations. For these reasons, a drought and extreme heat category is now included in the plan. As summarized in the table below, the following hazards will be addressed in this plan update: drought/extreme heat, dam & levee failures, floods, severe thunderstorms (including hailstorms and windstorms), hurricanes/tropical storms (also referred to as tropical cyclones), sinkholes (also referred to as land subsidence), winter storms/freezes, tornadoes, and wildfires. All of these hazards may impact each of the jurisdictions represented in the plan. However, sinkholes are unlikely to impact the City Bowling Green and the Town of Zolfo Springs. Each of the hazards identified within the plan were included because, based on previous occurrences, each hazard has a high probability of reoccurrence, although the frequency will vary.

**Table 2.5 Identified Hazards**

| Hazard Type | State Hazard Mitigation Plan 2007 | Hardee Local Mitigation Strategy 2005 | Hardee LMS Update 2009 | Hardee LMS Update 2015 |
|---|---|---|---|---|
| Avalanches | | | | |
| Coastal Erosion | ▪ | | | |
| Coastal Storms | | | | |
| Dam Failures | | | | ▪ |
| Drought (& Extreme Heat) | ▪ | | ▪ | ▪ |
| Earthquakes | | | | |
| Expansive Soils | | | | |
| Levee Failures | | | | ▪ |
| Floods | ▪ | ▪ | ▪ | ▪ |
| Hailstorms (Severe Thunderstorms) | | ▪ | ▪ | ▪ |
| Hurricanes (& Tropical Storms) | ▪ | ▪ | ▪ | ▪ |
| Land Subsidence (Sinkholes) | ▪ | ▪ | ▪ | ▪ |
| Landslides | | | | |
| Severe Winter Storms (Freezes) | ▪ | ▪ | ▪ | ▪ |
| Tornadoes | ▪ | ▪ | ▪ | ▪ |
| Tsunamis | | | | |
| Volcanoes | | | | |
| Wildfires | ▪ | ▪ | ▪ | ▪ |
| Windstorms | | | ▪ | ▪ |

# Hazard Profiles

### Dam and Levee Failures

The definition of a Dam is defined as "a barrier preventing the flow of water or of loose solid materials". For the 2015 Plan Update the LMS Committee agreed that Dam Failures are indeed a hazard for Hardee County and should be included as such. All dams are located on permitted mines in Hardee County and are owned and operated by Mosaic Company LLC. The Mosaic Company is the world's leading maker of phosphate, an essential ingredient utilized for growing foods.

### Location

Mining Operations that have dams in Hardee County are located in the Northwest corner of the County. The acreage of all dam areas is estimated at approximately 4,851.

Dams are constructed to mimic a rectangular form; the average size is approximately 400 acres and 50 feet in height. There are strict permitting guidelines that must be adhered to when construction is permitted as referenced in the Florida Administrative Code – State Chapter 62-672.550 and Subsection 3.14.02.050 of the Hardee County Land Development Regulations.

### Extent

The extent of damages that the County would suffer will depend on the exact location of a dam breach. All dams are inspected daily by trained Mosaic staff, monthly by trained County staff, and annually by a Licensed Professional Engineer. The Mosaic Company provides annual updates of their emergency response plan to the Board of County Commissioners. They also maintain a strong alliance with the staff of the County's mining department. The Mosaic Company has worked with the Hardee County Sheriff's Office to implement a reverse 911 system to alert downstream residents of any dam breach occurrence.

### Previous Occurrences

*October 1994* The Payne Creek Mine dam failure released about 28 million gallons of clay slurry and water to Hickey Branch.

*November 1994* The Hopewell Mine dam failure released millions of clay slurry and water to nearby wetlands and Alafia River.

Although both failures occurred in neighboring Counties the Payne Creek Mine failure affected Hardee County residents immensely; as the spill path flowed south into the northern part of the County and into the Payne Creek.

No Dam & Levee failures have occurred since the November 1994 incident.

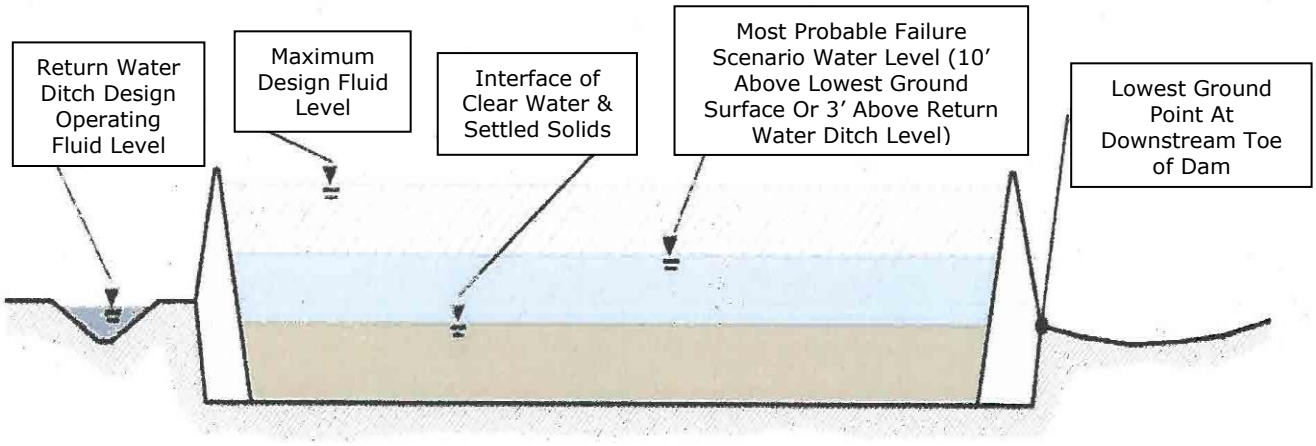
### Probability of Future Events

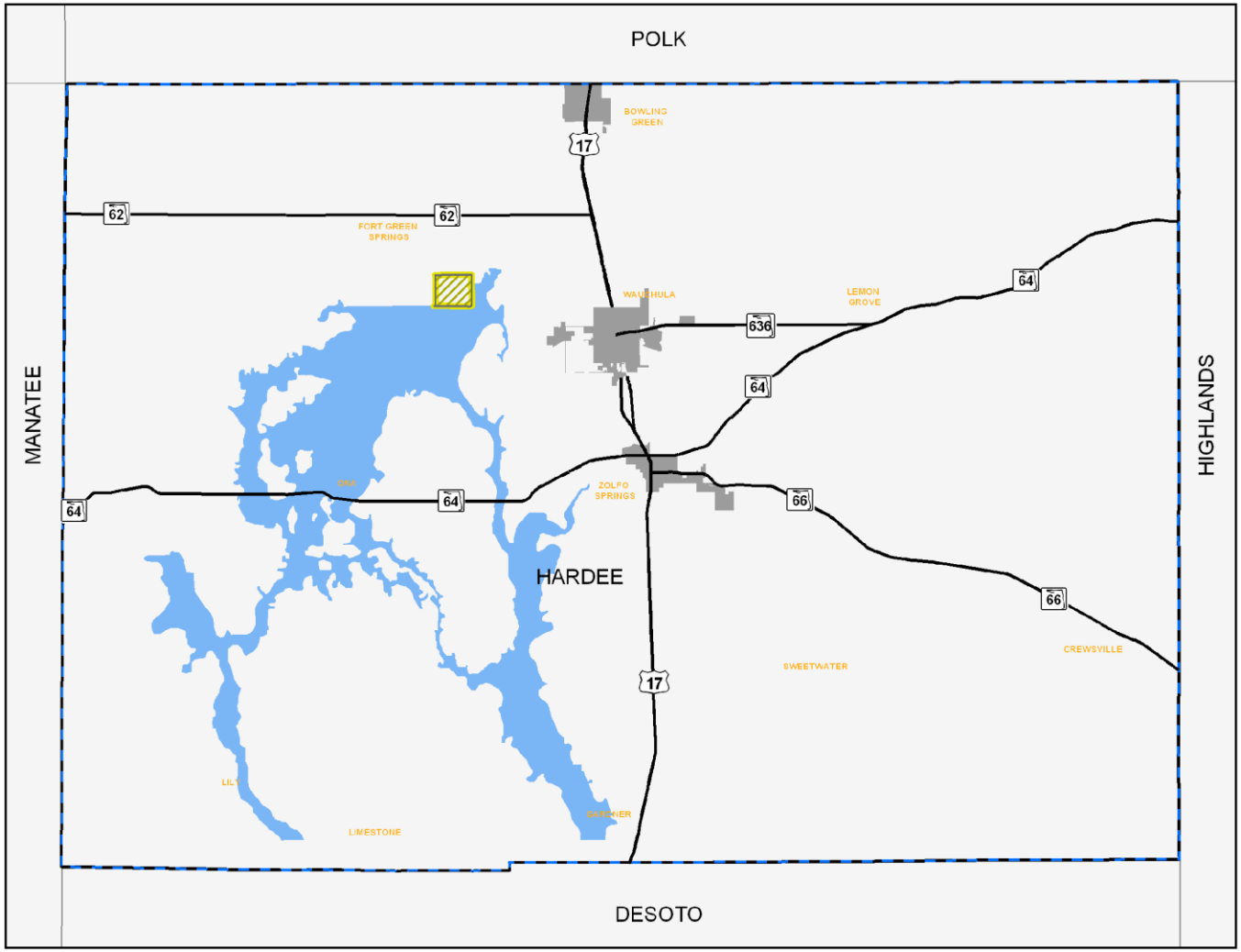
The probability that future dam and levee failures will occur somewhere within the planning area is low based on historical data; however, such an occurrence cannot be excluded.

We have obtained information complied for CF Industries, Inc.; Project No. 03-17947, dated May 2011. Said information was collected from BCI Engineers & Scientists in conjunction with AMEC, entitled "Dam Breach and Flooding Analysis for Clay Settling Area EC1". The most probable breach scenario used in the Study is based on the professional opinion of Dr. John E. Garlanger, P.E., of Ardaman and Associates, Inc., who is the geotechnical engineer of record for the geotechnical design of EC1. Dr. Garlanger's recommendation is included in an excerpt which summarizes the recommended assumptions, below:

"For dam breach analysis purposes, the water level in the settling area at the time of the hypothetical breach should be assumed at an elevation 10 feet above the lowest ground surface at the location of the hypothetical breach or 3 feet above the design water level in the return water, whichever is higher. The volume of the release during a hypothetical dam breach is the difference in elevation between the assumed water level in the settling area at the time of the breach and the lowest ground surface elevation at the location of the breach". We have provided a graphical depiction below for reference, in addition to a countywide map indicating the areas affected should this dam experience a failure.

**Graphical Depiction of Most Probable Breach Scenario Water Level Assumption**






## Legend

- Major Roads
- County Boundary
- EC1
- Dam Breach Flood Model
- Cities

27,716 - Acres Flooded

**HARDEE COUNTY FLOOD MODEL**

February 12, 2015

FILE: h:\hardee\arcm\em\lms\fluseflood

0 5 10 Miles

Source:

Hardee County Mining
Dam Breach and Flooding Analysis for Clay Settling Area EC1
Prepared by CF Industries

N W E S

### Drought & Extreme Heat

NOAA defines drought as a period of unusually dry weather that persists long enough to cause serious impacts such as crop damage or water supply shortages. The severity of a drought depends on moisture deficiency, duration, and size of the affected area. A number of indices have been developed to estimate the severity of droughts. Droughts are generally categorized into four types: meteorological, agricultural, hydrological, and socioeconomic.

A *meteorological drought* refers to a departure from normal precipitation rates. One index used to estimate this type of drought is the Standardized Precipitation Index (SPI). SPI is a drought index that only looks at precipitation rates.

An *agricultural drought* refers to the lack of sufficient soil moisture to meet crop production needs. The Crop Moisture Index (CMI) indicates short-term abnormal dryness or wetness that affects agriculture.

There are also *hydrological droughts* (below normal surface and subsurface water supplies) and *socioeconomic droughts* (water shortages that impact people). Other indices include the Keetch-Byram Drought Index (KBDI), which is an estimate of moisture in the soil and duff layer – the layer of decomposing organic material found on the forest floor – and the Palmer Drought Severity Index (PDSI), which uses temperature and rainfall information to calculate dryness and determine long-term drought. A table showing PDSI ratings and classifications is provided below.

**Table 2.6 Palmer Drought Severity Index**

| Rating | Classification |
|---|---|
| 4.0 or more | extremely wet |
| 3.0 to 3.99 | very wet |
| 2.0 to 2.99 | moderately wet |
| 1.0 to 1.99 | slightly wet |
| 0.5 to 0.99 | incipient wet spell |
| 0.49 to -0.49 | near normal |
| -0.5 to -0.99 | incipient dry spell |
| -1.0 to -1.99 | mild drought |
| -2.0 to -2.99 | moderate drought |
| -3.0 to -3.99 | severe drought |
| -4.0 or less | extreme drought |

*Source: http://drought.unl.edu/whatis/indices.htm*

In Hardee County, droughts are an infrequent yet recurring event. According the Hardee County CEMP, approximately 65-70% of rainfall in Florida occurs during June through September. Even during these months, rainfall is not uniformly distributed throughout the county. Hardee County's dry season is January through May when drought conditions are most likely.

A drought can also be accompanied by extreme heat compounding its effects. FEMA defines extreme heat as temperatures that rise 10 degrees (Fahrenheit) above the average high temperature for the region and last for several weeks. This could impact vulnerable populations causing death or heat-related illness. Statistics show that approximately 175 people die from extreme heat in the nation every year. Those most vulnerable to the effects of extreme heat are young children, the elderly, and people who are sick or overweight. In addition, Hardee County has a large agricultural sector requiring workers to be outside year-round. During extreme heat events, this population becomes vulnerable as well.

The following table provided by the Florida Division of Emergency Management shows the heat index. The heat index is the apparent temperature describing the combined effect of high air temperature with high humidity. As both of these factors increase, it becomes more difficult for the human body to cool itself.

**Table 2.7 Heat Index (Apparent Temperature)**

| Air Temperature F° | Relative Humidity % | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100 |
| 110° | 136 | | | | | | | | | | | | |
| 108° | 130 | 137 | | | | | | | | | | | |
| 106° | 124 | 130 | 137 | | | | | | | | | | |
| 104° | 119 | 124 | 131 | 137 | | | | | | | | | |
| 102° | 114 | 119 | 124 | 130 | 137 | | | | | | | | |
| 100° | 109 | 114 | 118 | 124 | 129 | 136 | | | | | | | |
| 98° | 105 | 109 | 113 | 117 | 123 | 128 | 134 | | | | | | |
| 96° | 101 | 104 | 108 | 112 | 116 | 121 | 126 | 132 | | | | | |
| 94° | 97 | 100 | 102 | 106 | 110 | 114 | 119 | 124 | 129 | 136 | | | |
| 92° | 94 | 96 | 99 | 101 | 105 | 108 | 112 | 116 | 121 | 126 | 131 | | |
| 90° | 91 | 93 | 95 | 97 | 100 | 103 | 106 | 109 | 113 | 117 | 122 | 127 | 132 |
| 88° | 88 | 89 | 91 | 93 | 95 | 98 | 100 | 103 | 106 | 110 | 113 | 117 | 121 |
| 86° | 85 | 87 | 88 | 89 | 91 | 93 | 95 | 97 | 100 | 102 | 105 | 108 | 112 |
| 84° | 83 | 84 | 85 | 86 | 88 | 89 | 90 | 92 | 94 | 96 | 98 | 100 | 103 |
| 82° | 81 | 82 | 83 | 84 | 84 | 85 | 86 | 88 | 89 | 90 | 91 | 93 | 95 |
| 80° | 80 | 80 | 81 | 81 | 82 | 82 | 83 | 84 | 84 | 85 | 86 | 86 | 87 |

| Extreme Danger | Extreme | Extreme Caution | Caution |
|---|---|---|---|
| Heat Stroke or Sun Stroke highly likely | Sun Stroke, Muscle Cramps, and/or Heat Exhaustion likely | Sun Stroke, Muscle Cramps and/or Heat Exhaustion possible | Fatigue Possible |

*Source: http://www.floridadisaster.org/bpr/EMTOOLS/Severe/heatwave.htm*

### Location

While drought events generally span the entire planning area, they most heavily impact the agricultural sector. As of 2014, the county has over 340,000 acres in agricultural uses. This includes: 94,138 acres in citrus groves, 7,144 acres in row crops, 254,577 acres in pastureland, 12,200 acres in dairy farms, and 1,952 acres in ornamental horticulture. Extreme heat events also impact the entire planning area. Most vulnerable to extreme heat are the county's estimated 3,575 elderly persons and over 7,587 estimated seasonal workers.

### Extent

Based on previous occurrences, the magnitude or severity of future drought events is likely to be moderate with occasional severe drought events according to the Palmer Drought Severity Index. During extreme heat events, temperatures may reach over 100 degrees Fahrenheit. Potentially high relative humidity could drastically increase the apparent temperature by 10 degrees or more.

**Previous Occurrences**

*1985* Highest temperature recorded in Wauchula, 102 degrees Fahrenheit (weather.com).

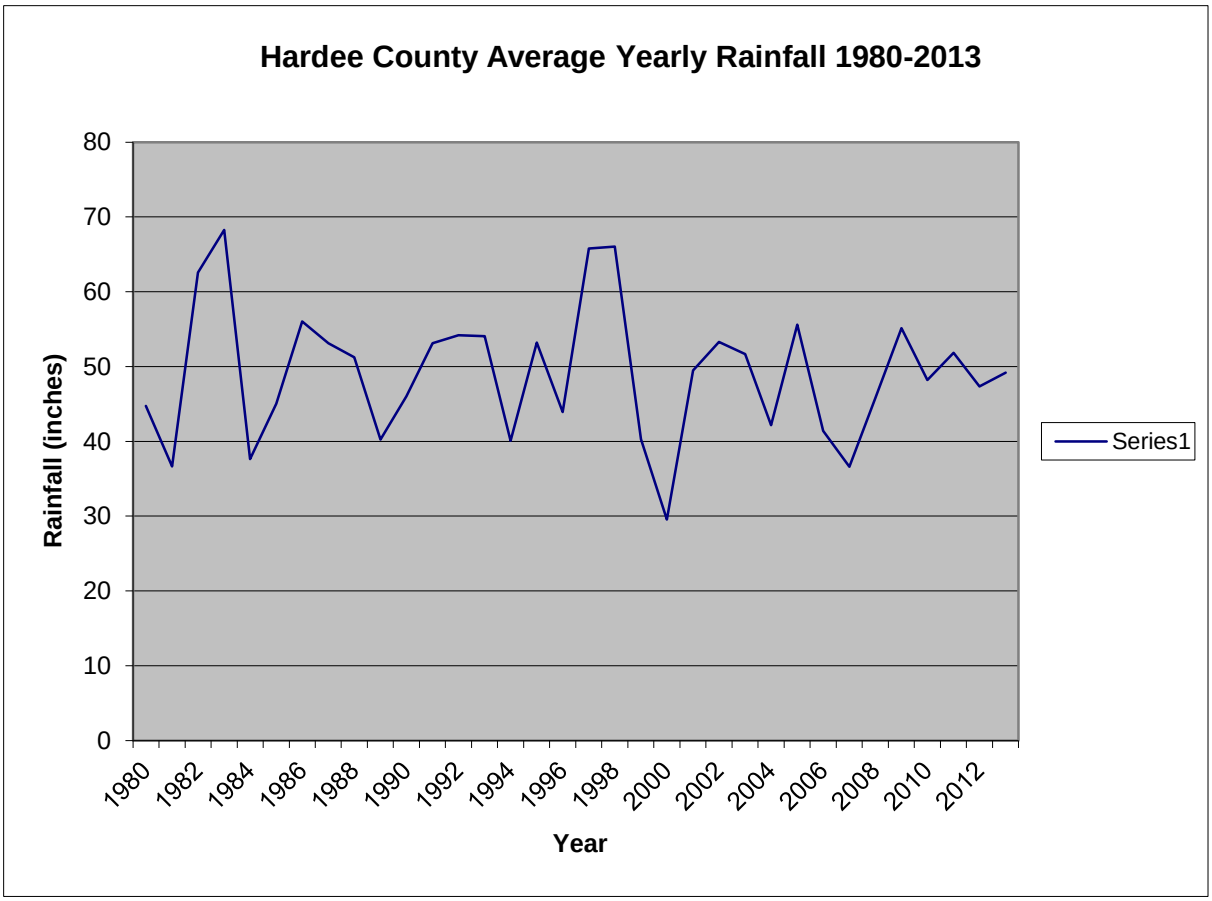
*1993* Throughout the state, residents experienced the hottest summer and the 2nd driest summer (June-Aug) on record since 1895. The statewide average temperature was 82.3 degrees Fahrenheit and average precipitation was 14.7 inches.

*2000-2001* According to the National Climatic Data Center, Florida received abundant rains in March of 2001 lessening the threat of wildfires and improving topsoil conditions. However, long-term drought conditions persisted. April 2000 through March 2001 ranked as the seventh driest 12-month period on record until that time. A graph indicating less-than-normal rainfall during 2000 is shown below.

*2007* Drought conditions persisted throughout much of the state and many water management districts implemented water conservation measures. In the South West Florida Water Management District, residents were limited to watering lawns once per week. This included Hardee County. According to the Palmer Hydrological Drought Index (Long-Term), the central portion of the state, including Hardee County, experienced 'moderate' drought conditions.

No drought & extreme heat conditions have occurred since the 2007 incident.

The county average yearly rainfall totals from 1970 to 2013 are provided below. The graph shows rainfall totals for the years 2000 and 2007 were well below average which likely contributed to the drought conditions.



### Probability of Future Events

The probability that drought and extreme heat will occur within the county in the future is high based on previous occurrences. The frequency of droughts and extreme heat is likely to be once every two to seven years based on the naturally occurring El Niño/La Niña cycle. In Florida, La Niña years are characterized by reduced rainfall and higher temperatures.

## Floods

In the State Hazard Mitigation Plan, floods are defined as the temporary condition of partial or complete inundation of normally dry land areas of surface water runoff from any source. Flooding in Hardee County may be caused by either heavy rainfall or rising river waters. Other areas in Florida are also susceptible to coastal flooding from storm surge.

The severity of floods is determined by many factors: rainfall, river flow, tidal surge, topography, and flood-control measures. Particularly in the state of Florida, land-use changes from building and development intensify the severity of floods (floodsmart.gov). These changes to land uses produce greater amounts of impermeable surface and development within low-lying areas that cause increased runoff and put more people and capital in risk-prone areas.

Flooding causes a number of impacts to life and property. Direct effects include the loss of life, personal property, crops, business facilities, utilities, and transportation infrastructure. Floods can also indirectly cause economic and societal impacts when transportation routes are damaged or destroyed thus inhibiting the transport of needed supplies. Pooled flood waters can inundate drinking water supplies and harbor diseases that lead to public health issues, and moving flood waters can cause erosion damaging agriculture and infrastructure.

Flooding not only is a hazard to those living in flood-prone areas, but can affect individuals outside their home. The Florida Division of Emergency Management has provided the following flood statistics:

- As little as one foot of moving water can move most cars off the road.
- Just six inches of fast-moving flood water can sweep a person of his or her feet.
- Most flood-related deaths occur at night and result from vehicular accidents.
- Urban and small stream flash floods often occur in less than one hour.

**Hardee County Flooding**

### Location

Areas within the 100-year floodplain are vulnerable to flooding. These areas generally lie along the major waterways within the county, including the Peace River, Horse Creek, and Charlie Creek. In addition, the residential community along Bronco Drive in the southern portion of unincorporated Hardee County and the Riverview Heights subdivision east of the City of Wauchula in unincorporated Hardee County are identified as areas that may be vulnerable to flooding based on repetitive flood claim information. Approximately 107,443 acres of land and waterways are vulnerable to flooding throughout the entire county. A map showing flood vulnerable areas is provided in the Appendix.

### Extent

The extent of flooding throughout the county depends largely on the amount, location, and duration of rainfall, current level of soil saturation, conditions upstream, and so forth. Under extreme circumstances, the magnitude or severity of flooding along the Peace River could reach a crest of 25 feet similar to that experienced in 1933. See Table 2.8 below for historic crest records for the Peace River.

### Previous Occurrences

*December 13, 1997* Heavy rains caused homes to flood along the Peace River near U.S. Highway 17 near the southern county line. Areas along Horse Creek were impacted as well. Damages within the county were estimated at $250,000 (National Climatic Data Center).

*June 22, 2003* Due to severe thunderstorms that passed through the region, fresh water flooding inundated areas for three days. Local rainfall totals were in excess of 11 inches. Within Hardee County, most of the damage was confined to public infrastructure in the areas of Bowling Green, Wauchula, and Zolfo Springs. Several other counties were impacted as a result of the storms. According to the State Hazard Mitigation Plan, flooding associated with this hazard event caused over $11 million in damages within the impacted area. The National Climatic Data Center reported $350,000 in damages in the City of Bowling Green.

*February 27, 2005* Severe thunderstorms producing heavy rainfall caused flooding in the City of Bowling Green. Portions of U.S. Highway 17, State Road 62, County Road 663, and West Central Avenue and five private residences were inundated.

*June 12, 2005* Heavy afternoon rains brought street level flooding to various areas already saturated with water from Tropical Storm Arlene and thunderstorms from the previous week. The River Valley Mobile Home Park was one of the areas impacted by flooding. In addition, a water main break necessitated the issuance of a boil water notice to the residents of the Knollwood Subdivision and the Citrus Valley Mobile Home Park.

No Flooding events have occurred since the June 2005 incident.

In addition the historic flooding occurrences listed above, NOAA reports that the Peace River has experienced six major floods and four moderate floods since 1933. Information on these flood events is provided below. At the point in Zolfo Springs where this information is gathered, flood stage is a crest of 16 feet, a moderate flood has a crest of 20 feet, and a major flood has a crest of 22 feet.

**Table 2.8 Flooding of Peace River at Zolfo Springs**

| Date | Crest | Type |
|---|---|---|
| 6-Sep-33 | 25.05 feet | Major |
| 25-Jun-45 | 21.64 feet | Moderate |
| 20-Sep-47 | 24.15 feet | Major |
| 24-Sep-48 | 21.55 feet | Moderate |
| 29-Aug-49 | 23.11 feet | Major |
| 1-Aug-60 | 22.21 feet | Major |
| 12-Sep-60 | 23.61 feet | Major |
| 21-Mar-98 | 21.33 feet | Moderate |
| 8-Sep-04 | 22.42 feet | Major |
| 29-Sep-04 | 21.19 feet | Moderate |

*Source: http://weather.gov*

### Probability of Future Events

The probability that flooding will occur somewhere within the county is very high based on historical information. The frequency that severe flooding may occur is annually. Localized flooding may occur even more frequently.

### Freezes & Winter Storms

In Florida, freezes and winter storms mostly impact agricultural operations. Particularly within the county, citrus groves and winter row crops are susceptible to freezes. Florida Citrus Mutual defines an impact freeze as one that is so severe that it annihilates entire groves across the state, killing both mature and young citrus trees, while causing a profound economic impact on the citrus industry and usually prompting growers to replant farther south. Five impact freezes have been reported in the state. According to Florida Citrus Mutual, four significant freezes occurred during the 1980s that together impacted the citrus industry substantially. The Florida Division of Emergency Management provides the following definitions:

- A *freeze* occurs when surface air temperature is below freezing (32ºF) over a widespread area for a significant period of time. A freeze is a term used for the condition when vegetation is injured by these low air temperatures, regardless if frost is deposited.
- *Frost* is a cover of ice crystals produced by deposition of atmospheric water directly on the surface at or below freezing.
- A *freeze warning* is issued by the National Weather Service to make agricultural interest and the public aware of anticipated freeze conditions over a large area.
- A *hard freeze warning* is issued by the National Weather Service to make agricultural interests and the public aware of anticipated freeze conditions that are of four-hour duration or greater, below 28ºF, and over a large area.

While primarily impacting agriculture, freezes and harsh winter temperatures can also impact humans. During the winter of 1989-1990, 26 Florida residents died of hypothermia or abnormally low body temperatures (Floridadisaster.org). With Florida's generally mild temperatures, residents may not always take proper precautions when extreme cold events occur. Besides hypothermia, frostbite could also become an issue when residents are unprepared. Often overlooked, the wind chill factor is an indicator of the impacts of extremely cold temperatures and high winds on the human body. A *wind chill* is the cooling effect due to the combination of temperature and wind. It is expressed as the loss of body heat. A table showing wind chill levels is provided below.

**Table 2.9 Wind Chill**

| Wind (MPH) | Temperature (F) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **40** | **35** | **30** | **25** | **20** | **15** | **10** | **5** | **0** |
| **5** | 36 | 31 | 25 | 19 | 13 | 7 | 1 | -5 | -11 |
| **10** | 34 | 27 | 21 | 15 | 9 | 3 | -4 | -10 | -16 |
| **15** | 32 | 25 | 19 | 13 | 6 | 0 | -7 | -13 | -19 |
| **20** | 30 | 24 | 17 | 11 | 4 | -2 | -9 | -15 | -22 |
| **25** | 29 | 23 | 16 | 9 | 3 | -4 | -11 | -17 | -24 |
| **30** | 28 | 22 | 15 | 8 | 1 | -5 | -12 | -19 | -26 |
| **35** | 28 | 21 | 14 | 7 | 0 | -7 | -14 | -21 | -27 |
| **40** | 27 | 20 | 13 | 6 | -1 | -8 | -15 | -22 | -29 |
| **45** | 26 | 19 | 12 | 5 | -2 | -9 | -16 | -23 | -30 |
| **50** | 26 | 19 | 12 | 4 | -3 | -10 | -17 | -24 | -31 |
| **55** | 25 | 18 | 11 | 4 | -3 | -11 | -18 | -25 | -32 |
| **60** | 25 | 17 | 10 | 3 | -4 | -11 | -19 | -26 | -33 |

*Source: http://www.floridadisaster.org/bpr/EMTOOLS/Severe/cold.htm*

**Location**

While freeze events generally span the entire planning area, they most heavily impact the agricultural sector. As of 2014, the county has over 340,000 acres in agricultural uses. This includes: 91,138 acres in citrus groves, 7,144 acres in row crops, 254,577 acres in pastureland, 12,200 acres in dairy farms, and 1,952 acres in ornamental horticulture.

**Extent**

**Freeze Occurrences**

- December 1983
- January 1985
- December 1989
- January 19, 1997
- January 6, 1999
- December 20, 2000
- January 5 & 10, 2001
- January 2002
- January 22, 2009
- December 2009
- January 2010
- February 2010
- March 2010
- December 2010
- January 2011
- January 2012
- December 2012
- February 2013
- March 2013

The magnitude or severity of freezes that may occur within the planning area could be as low as 20 degrees Fahrenheit or, in rare cases, a few degrees lower. The severity of the impacts associated with freezes depends on multiple factors including timing, location, and duration of the freeze and types of crops being grown during the event.

**Previous Occurrences**

*December 1983, January 1985, and December 1989* The combined impacts of these freezes proved devastating to the state citrus crops. The National Climatic Data Center reported $1.2 billion in damages to the citrus industry statewide as a result of the 1985 freeze. The 1983 freeze damages were estimated at $2 billion statewide.

*January 19, 1997* Temperatures dropped into the low to mid-20s across much of the state. The winter crops in southwest Florida were severely impacted. In Hardee County, 25 percent of the citrus crop was lost.

*January 6, 1999* The State Hazard Mitigation Plan states that temperatures fell below freezing for over twelve hours impacting local winter crops in Polk, Highlands, Hardee, DeSoto, Hillsborough, and Manatee Counties. Tomato, squash, and strawberry crops were impacted with $200,000 in property damage and $475,000 in crop damage being reported in the region.

*December 20, 2000* Temperatures in Hardee County fell below freezing for a period of two to four hours. Total crop damage to the entire West Central Florida region was estimated at $1 million (State Hazard Mitigation Plan, 2007).

*January 2001* On the fifth, temperatures in the low to mid 20s were reported in the county for up to eight hours. On the tenth, temperatures dropped again into the 20s for up to three hours.

*January 2002* Temperatures fell below freezing numerous times during the month of January. No significant damages were reported, however (State Hazard Mitigation Plan, 2007).

*January 22, 2009* The Florida Hard Freeze Update indicated that temperatures reached a low of 19 degrees near the Highlands County/Hardee County border. Heavy frost and ice were present on citrus trees. As a precaution, many citrus growers turned on irrigation systems the night before. Nurseries did not receive significant impacts.

*December 2009* Temperatures fell below freezing a minimum of 3 nights during the time frame of December 23-30;

temperatures dropped to a low of 28 degrees, no significant damages were reported.

*January 2010* Temperatures fell below freezing numerous times, almost nightly, during the time frame of January 02-14; temperatures dropped to a low of 22 degrees yet no significant damages were reported. This cold occurrence proves to have lasted the longest.

*February 2010* Temperatures fell below freezing a minimum of 2 nights on February 14th and February 26th. Temperatures dropped to a low of 30 degrees.

*March 2010* Temperatures fell below freezing a minimum of 4 nights during the time frame of March 01-08; temperatures dropped to a low of 29 degrees. No significant damages were reported.

*December 2010* Temperatures fell below freezing numerous times, a minimum of at least 11 nights, during the time frame of December 05-30; the lowest recorded temperature for this time frame was 23 degrees. No significant damages were reported. This cold occurrence matched the temperature drops during January 2010.

*January 2011* Temperatures fell to 30 degrees on two nights during this month, January 23rd and 24th.

*January 2012* Temperatures fell below freezing numerous nights this month during the time frame of January 4-16; temperatures remained between 25 to 27 degrees. No significant damages were reported.

*December 2012* Temperatures fell to 28 degrees on two nights this month, December 22nd and 23rd; however, no significant damages were reported.

*February 18, 2013* Temperatures fell to 28 degrees; however, no significant damages were reported.

*March 05, 2013* Temperatures fell to 29 degrees; however, no significant damages were reported.

### Probability of Future Events

Based on previous occurrences, the likelihood that freezes will occur within the county are high. The frequency of these events will likely be about once a year.

### Hurricanes & Tropical Storms (Tropical Cyclones)

Hurricanes and tropical storms are types tropical cyclones or low pressure systems that generally form in the tropics. These events bring thunderstorms and circulating winds. These events can also spawn tornadoes, create storm surges along the coast, and produce heavy rains. The Atlantic hurricane season lasts from June 1-November 30.

Hurricanes are categorized based on wind speed, central pressure, and damage potential. The Saffir-Simpson scale shown below was developed in 1969 and remains the standard for describing an event's disaster potential. This allows emergency managers and others to comprehend the potential property damage and expected flooding of oncoming hurricanes. In 2009, the National Hurricane Center decided to remove the category storm surge, due to the inaccuracies of previous storms. The surges produced by actual storms such as Hurricane Ike in 2007 were estimated to produce 6-8 feet of surge when it actually produced storm surge values of about 20 feet. For Hurricane Charley in 2004, the surges were expected at about 13-18 feet, when the surge produced was only about 7 feet. In 2012, the National Hurricane Center also deemed it necessary to implement changes in the sustained winds category. Those changes are noted in the table below.

**Table 2.10 Saffir-Simpson Hurricane Scale**

| Scale Number (Category) | Sustained Winds (MPH) | Damage | |
|---|---|---|---|
| 1 | 74-95 | Minimal: Unanchored mobile homes, vegetation and signs. | |
| 2 | 96-110 | Moderate: All mobile homes, roofs, small crafts, flooding. | |
| 3 | 111-129 | Extensive: Small buildings, low-lying roads cut off. | |
| 4 | 130-156 | Extreme: Roofs destroyed, trees down, roads cut off, mobile homes destroyed. Beach homes flooded. | |
| 5 | More than 157 | Catastrophic: Most buildings destroyed. Vegetation destroyed. Major roads cut off. Homes flooded. | |

*Source: http://www.nhc.noaa.gov/aboutsshws.php*

### Location

Hurricanes and tropical storm events may occur throughout the planning area.

### Extent

The magnitude or severity of hurricanes impacting the planning area is likely to be a Category 3 or less on the Saffir-Simpson Scale. Based on historical hurricane occurrences, Category 4 storms making landfall generally weakened to a Category 3 before passing over the county. However, there is a possibility that Category 4-5 hurricanes could impact Hardee County in the future.

### Previous Occurrences

*September 11, 1960* Making landfall between Naples and Fort Myers, Hurricane Donna ranked as a category 4 on the Saffir-Simpson Scale. As a result, much of the state's orange and tangerine crop was destroyed.

**Tropical Cyclone Occurrences**

- October 18, 1910 (Cat 2)
- May 14, 1916 (TS)
- December 1, 1925 (Cat 1)
- July 31, 1933 (TS)
- September 16, 1945 (Cat 3)
- September 10, 1960 (Cat 4)
- June 4, 1968 (TS)
- November 23, 1988 (TS)
- August 13, 2004 (Cat 4)
- October 23, 2005 (Cat 2)
- August 19, 2008 (TS)

*September 14, 2001* Although Tropical Storm Gabrielle did not directly hit Hardee County, some damages were incurred from heavy rainfall and winds associated with the event. According to the National Climatic Data Center, the county experienced five to seven inches of rainfall resulting in flooding of homes and businesses and wind gusts of 45-55 mph were reported. The county experienced downed trees and damage to roofs. Damage in Hardee and DeSoto counties was estimated at $5 million (National Climatic Data Center, 2009).

*August 13, 2004* Hurricane Charley's impact to southwest and west central Florida was tremendous. The event resulted in 8 direct fatalities, 16 indirect fatalities, 792 injuries, eight tornadoes, an eight-foot storm surge in Lee County, an estimated $11.2 billion in property damage, and $460 million in crop damage. In Hardee County alone, the hurricane resulted in six injuries and $750 million in damages. Approximately 1,400 homes were destroyed and 3,600 homes experienced minor to major damage. Many citrus groves north of Wauchula were severely damaged. Power outages were experienced throughout the county and in some areas power outages lasted over two weeks. A wind gust of 109 mph was recorded in Wauchula. The 2004 Hurricane Season also produced other storms that passed near Hardee County. Only weeks after Hurricane Charley, both Hurricane Frances and Hurricane Jeanne passed near the county producing high winds and heavy rains.

*October 23, 2005* Hurricane Wilma passed through the Florida Peninsula generating tropical storm force winds in Hardee County. A mesonet station in Ona recorded a peak wind speed of 53 mph. At least 55 insurance claims were submitted in Hardee County totaling $31,000. The storm also produced a tornado that was reportedly seen near the Town of Zolfo Springs.

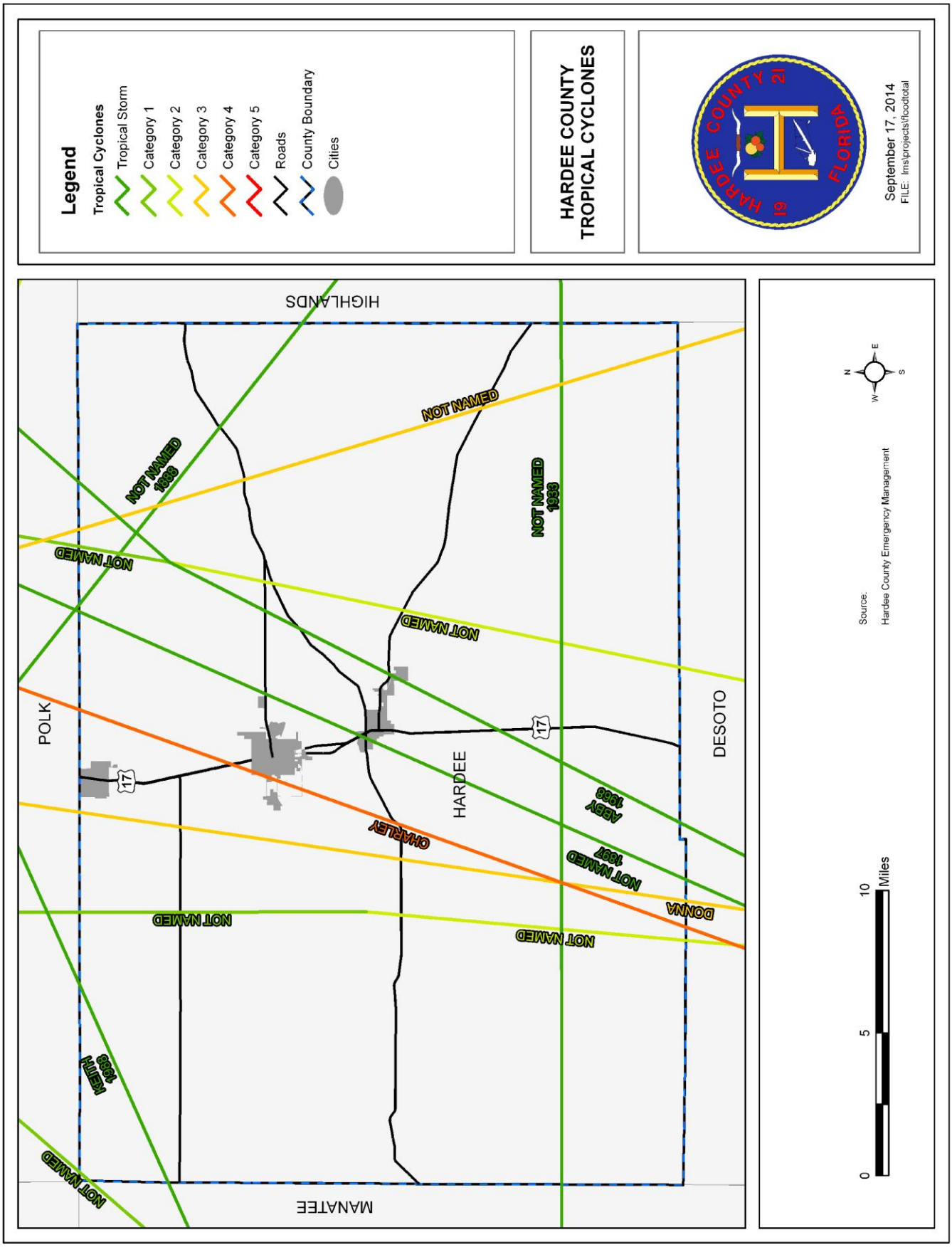
*August 19, 2008* Although not directly hitting the county, Tropical Storm Fay produced 42 mph winds recorded at the Emergency Operations Center in Hardee County. The tropical storm left a mobile home in Zolfo Springs with major roof damage from winds and subsequent damage from water.

No tropical cyclones have impacted Hardee County since the August 2008 incident.

A total of 24 hurricanes and tropical storms have passed within 25 miles of Hardee County since 1900. Nine of those have passed directly over the county.

### Probability of Future Events

The probability that hurricanes and tropical storms will pass through the county is very high based on previous occurrences. The frequency that hurricanes or tropical storms will pass directly over the county is approximately once every 10 years. However, hurricanes and tropical storms passing nearby impact the county almost annually.


Legend
Tropical Cyclones
Tropical Storm
Category 1
Category 2
Category 3
Category 4
Category 5
Roads
County Boundary
Cities
HARDEE COUNTY
TROPICAL CYCLONES
HARDEE COUNTY 21
19
FLORIDA
September 17, 2014
FILE: lms\projects\floodtotal
HIGHLANDS
POLK
MANATEE
DESOTO
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17
NOT NAMED
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### Severe Thunderstorms & High Wind Events

Every thunderstorm produces lightning but can also bring heavy rainfall, hail, and tornadoes. Lightning that is produced by a thunderstorm is essentially a gigantic electrostatic discharge between the cloud and the ground, other clouds, or within a cloud. This type of natural occurrence can be very dangerous. The National Weather Service reports that from 1959-2007 there were 449 reported fatalities and 1,788 reported injuries from lightning strikes in the state. Florida leads the nation in lightning-related deaths and injuries. Lightning often strikes outside of heavy rain and may occur as far as ten miles from any rainfall (National Disaster Education Coalition).

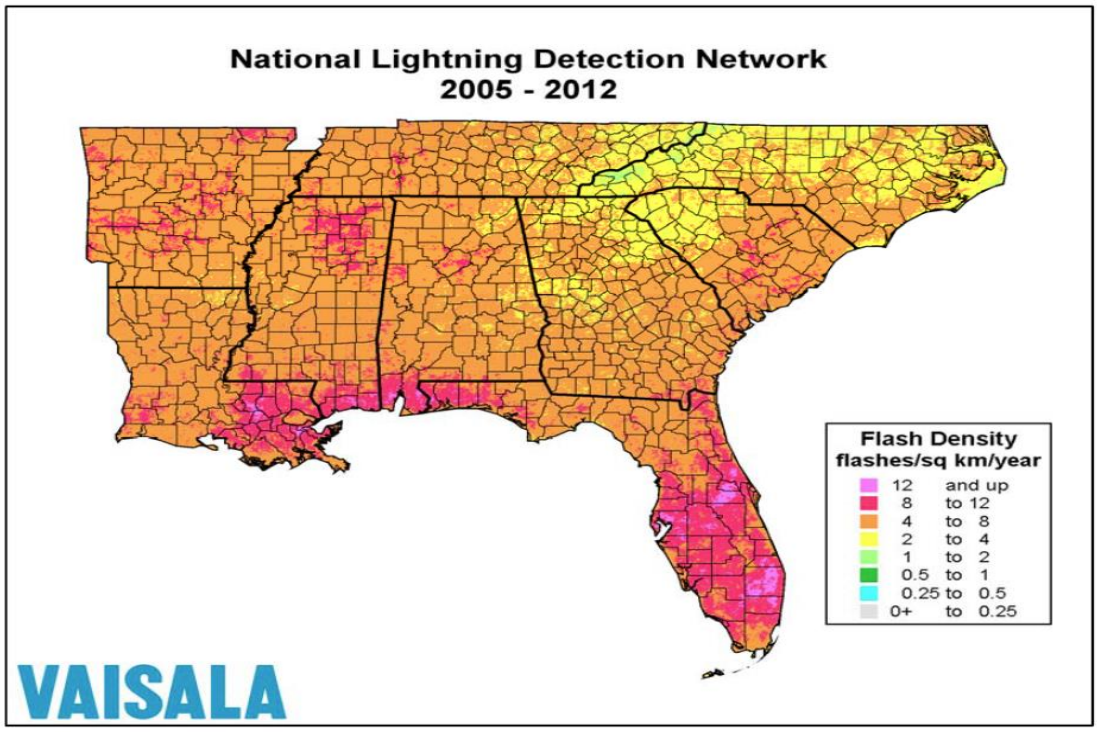
The National Weather Service defines a *severe thunderstorm* as one that either produces hail at least three-quarters of an inch in diameter, has winds of 58 miles per hour or greater, or produces a tornado. A typical thunderstorm spans 15 miles in diameter and lasts an average of 20 to 30 minutes. Of all thunderstorms that occur throughout the United States each year, about ten percent are classified as severe. Florida's warm, humid climate is highly favorable for thunderstorm formation (FEMA, 2009).

#### Location

Severe thunderstorms producing lightning, hail, and high winds may occur over the entire planning area.

#### Extent

The magnitude or severity of thunderstorms is measured by the diameter of hail, the speed of wind, or the occurrence of tornadoes it produces. Severe thunderstorms, as defined above, are expected to occur at some point throughout the entire planning area. The extent of damage from the occurrence of severe thunderstorms largely depends on the amount of lightning and hail produced by the event, the speed of winds, and the amount, location, and duration of rainfall associated with the event. As an example, according to the Southeast US lightning data from national lightning detection network, there were 12 lightning strikes per $km^2$ per year. There was hail reported as large as 1.75 inches in the December 1997 event, and winds reached 60 knots in the June 2004 thunderstorm.




*Source: Valisala, June 2013, Southeast US Lightning Data from National Lightning Detection Network*

### Previous Occurrences

*January 16, 1993* A severe thunderstorm producing strong winds downed trees, damaged an aircraft at the municipal airport, and blew a vehicle off the road. Damages were estimated at $50,000.

*August 3, 1993* A strong thunderstorm damaged the roof of a local restaurant causing $5,000 in damages.

*June 14, 1994* Thunderstorm winds caused roof damage to a local business, downed power lines, and tree limbs. Damages were estimated at $100,000.

*December 25, 1997* Severe thunderstorm activity producing tornadoes and heavy rainfall caused damages throughout the region. As a result, Hardee County received a disaster declaration and residents became eligible for various assistance programs.

*August 2, 1999* The Hardee County Sheriff's Department reported that a strong thunderstorm with high winds destroyed a barn, downed trees and power lines, and caused roof damage to homes in Bowling Green and Wauchula. At the Wauchula Municipal Airport, winds removed hanger doors. An estimated $150,000 in damages was reported.

*August 9, 2001* Hardee County Emergency Management reported that a strong thunderstorm toppled a large travel trailer in Bowling Green. Trees and large branches were also downed from high winds in the Bowling Green area. Estimated damages were $35,000.

*July 6, 2002* Severe thunderstorms caused roof damage to three homes and downed several trees. Damages were estimated at $10,000.

*May 19, 2003* A severe thunderstorm with reported wind gusts of over 50 mph caused $35,000 in damages to ten homes in the Zolfo Springs Area.

*June 27, 2004* Thunderstorm wind gusts downed numerous trees on the south side of Wauchula. One home and one vehicle on the 500 block of South Road were damaged by falling trees. A pharmacy under construction also experienced roof damage. Scattered debris was reported in the Knollwood Circle area.

*December 18, 2009* Severe thunderstorm wind gusts damaged three buildings and fifteen vehicles on the west side of the County. The buildings suffered roof and siding damages, the vehicles suffered scratches and one was found overturned. Scattered debris and uprooted trees were also reported.

No Severe thunderstorm & high wind events have occurred since the December 2009 incident.

### Probability of Future Events

The probability that severe thunderstorms will occur somewhere in the county is very high based on previous occurrences. The frequency that these events may occur is annually. According to the State Hazard Mitigation Plan, Hardee County has an annual probability of 0.8 to 1.2 percent for wind speeds of 115 mph or greater.

## Sinkholes

Sinkholes are common in Florida where there are various karst landforms. Florida Geological Survey defines karst as the characteristic terrain produce by erosional processes associated with the chemical weathering and dissolution of carbonate rock that begins when it is exposed to acidic water. Since the state of Florida is underlain by porous limestone, acidic rainwater can percolate through and slowly dissolve the limestone causing underground voids. When the overlying sediments collapse into the voids, sinkholes are formed (Florida Geological Survey, 2009)

Sinkholes may develop slowly creating a bowl-shaped depression or may form suddenly producing a steep-sided, water-filled crater. The shape of the sinkhole and how quickly it forms depend on the size of the underground void and the thickness of the overlying sediments (University of Florida, 2003).

Although the entire state of Florida is susceptible to sinkholes, some areas experience more sinkholes than others. A 1985 report from the Florida Department of Natural Resources Bureau of Geology places Hardee County within the type IV area where cover is more than 200 feet thick consisting of cohesive sediments interlayered with discontinuous carbonate beds. This area has few sinkholes but occasionally some large-diameter, deep sinkholes occur. These sinkholes are generally cover-collapse sinkholes where cohesive layers of sediment collapse into underground cavities.

**Sinkhole Occurrences**

- January 1, 1960
- May 23, 1989
- June 2, 2000
- June 26, 2000
- September 28, 2002
- September 1, 2004
- December 28, 2004
- April 14, 2005

### Location

As mentioned above, the entire county lies within an area that rarely experiences sinkholes, but where some large-diameter, deep sinkholes are possible. The location of future sinkholes is difficult to estimate. However, using reported sinkhole data from the Florida Geological Survey, county staff have identified the areas within a one-half mile radius of the eight previously identified sinkholes as vulnerable to this hazard. The locations of previous sinkholes are provided in a map below

### Extent

The magnitude or severity of sinkholes depends on the size, location, and the speed of sinkhole formation. The county lies in an area where few large-diameter, deep sinkholes may occur. In a worst-case scenario, a large diameter, deep sinkhole could appear suddenly and result in property damage. Historical documentation suggests that the June 26, 2000 sinkhole is the largest to occur in Hardee County measuring at 15' in diameter and up to 12' in depth.

### Previous Occurrences

The Florida Geological Survey reports 8 sinkholes in Hardee County. The following information was available about each:

*January 1, 1960* This sinkhole was located near the intersection of Old Bradenton Road and Smith Road.

*May 23, 1989* This sinkhole was located in the Sweetwater area. Reports suggest this sinkhole was caused the construction of a new well on site.

*June 2, 2000* This sinkhole was located off Clifton Bryan Road. The diameter of the sinkhole was five feet and the depth was three feet.

*June 26, 2000* This sinkhole was located in an orange grove near Johnston Road. With a diameter of fifteen feet and a depth of twelve feet, the sinkhole reportedly swallowed some orange trees.

*September 28, 2002* This sinkhole was located near the intersection of Broadus Williams Road and Merle Langford Road. Approximately one foot by one foot, this small sinkhole was repaired by Hardee County Road and Bridge Department.

*September 1, 2004* This sinkhole was located on private property off Magnolia Drive in Wauchula.

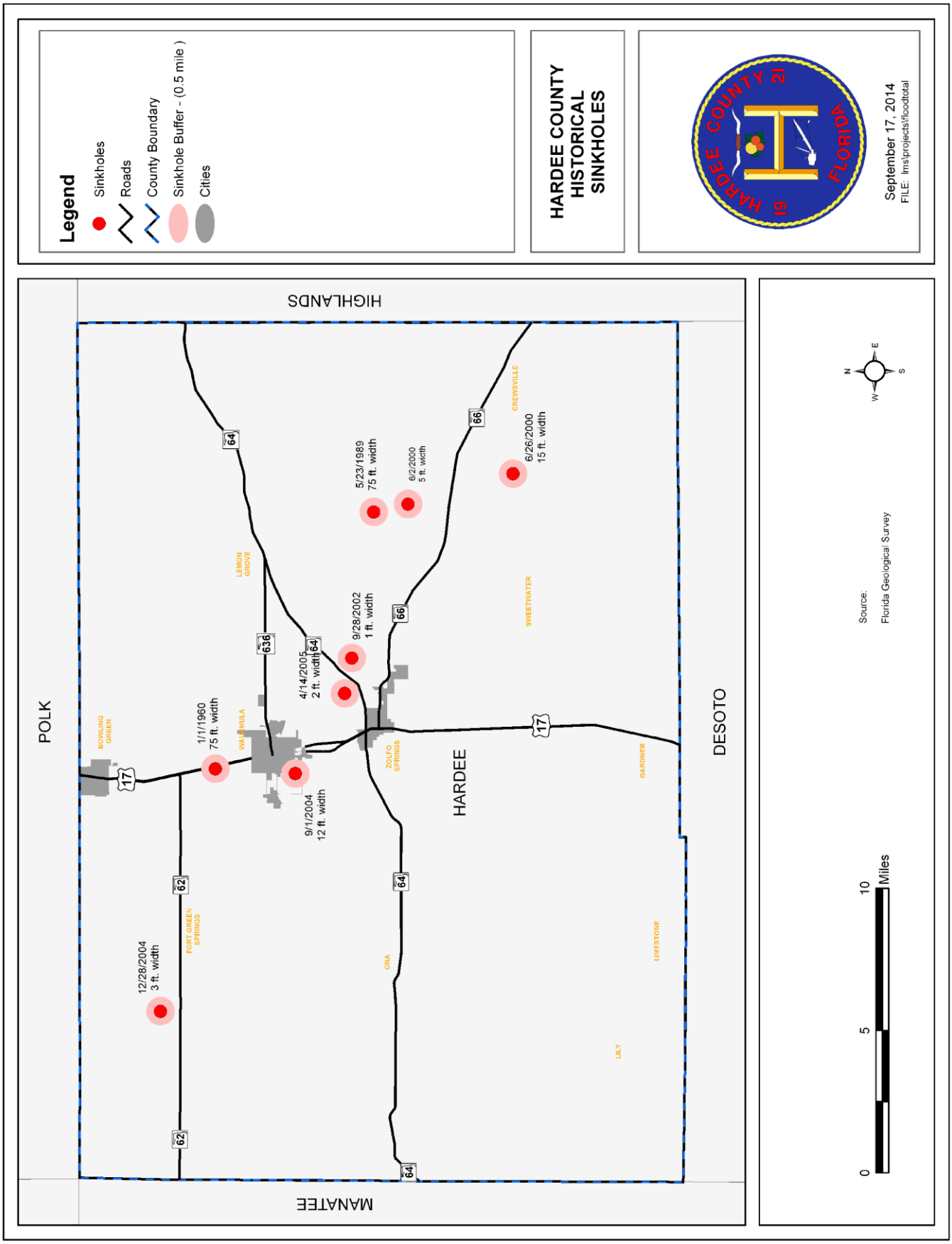
*December 28, 2004* Two small sinkholes were reported. They were located on private property off Methodist Church Road.

*April 14, 2005* This sinkhole was located off Gilliard Farms Road in Zolfo Springs. The sinkhole appeared near a driveway and did not impact any structures.

No sinkhole events have occurred since the April 2005 incident.

### Probability of Future Events

The probability that future sinkholes will occur somewhere within the planning area is high based on historical data. However, the frequency that sinkholes occur is low, particularly sinkholes of geologic significance. Only two previously recorded sinkholes were deeper than 5 feet and most were very small in diameter.


Legend
Sinkholes
Roads
County Boundary
Sinkhole Buffer - (0.5 mile )
Cities
HARDEE COUNTY
HISTORICAL
SINKHOLES
HARDEE COUNTY 21
19 FLORIDA
September 17, 2014
FILE: lms\projects\floodtotal
POLK
HIGHLANDS
MANATEE
DESOTO
HARDEE
BOWLING GREEN
WAUCHULA
LEMON GROVE
FORT GREEN SPRINGS
ZOLFO SPRINGS
ONA
LILY
LIMESTONE
GARDNER
SWEETWATER
CREWSVILLE
12/28/2004
3 ft. width
1/1/1960
75 ft. width
9/1/2004
12 ft. width
4/14/2005
2 ft. width
9/28/2002
1 ft. width
5/23/1989
75 ft. width
6/2/2000
5 ft. width
6/26/2000
15 ft. width
17
62
64
636
66
N
W
E
S
Source:
Florida Geological Survey
0
5
10
Miles

### Tornadoes

Tornadoes are rotating, funnel-shaped clouds that extend from a thunderstorm to the ground with whirling winds that can reach 300 miles per hour. This type of hazard can cause a path of damage over one mile across and 50 miles long (FEMA). In Florida there are two tornado seasons. The summer season lasts from June until September and has the highest frequency of tornado occurrence. However, these are generally weaker tornadoes (F0-F1 on the Fujita Scale) that spawn from land-falling tropical cyclones. The spring season (February-April) usually has higher intensity tornadoes due to the presence of the jet stream.

Tornadoes are rated using the Fujita or Enhanced Fujita Scale. The original Fujita Scale was developed by Dr. T. Theodore Fujita in the early 1970s and was used to relate the degree of damage to the intensity of wind. The original Fujita Scale, used for over three decades, was replaced by the Enhanced Fujita Scale on February 1, 2007. It should be noted that precise tornado wind speeds are largely unknown and tornado ratings are assigned based on the judgment of trained meteorologists and engineers who survey damages. However, different winds may be needed to cause the same damage depending on how well-built a structure is, wind direction, wind duration, battering by flying debris, and many other factors. As a result, occasionally different ratings may be assigned for the same tornado (NOAA Storm Prediction Center, 2009). A table showing the Fujita and Enhanced Fujita Scales and the typical damages associated with certain intensity tornadoes are provided below.

| Table 2.11 Fujita Scale | | | |
|---|---|---|---|
| **F-Scale Number** | **Fastest Quarter Mile Wind Speed** | **Type of Damage** | **Enhanced Scale 3 Second Wind Gust Speed** |
| F0 | 40-72 mph | Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages sign boards. | 65-85 mph |
| F1 | 73-112 mph | Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed. | 86-110 mph |
| F2 | 113-157 mph | Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated. | 111-135 mph |
| F3 | 158-206 mph | Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted. | 136-165 mph |
| F4 | 207-260 mph | Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated. | 166-200 mph |
| F5 | 261-318 mph | 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 reinforced concrete structures badly damaged. | Over 200 mph |
| F6 | 319-379 mph | With winds above 318 mph, F6 tornadoes are considered "inconceivable tornadoes." No F6 has ever been recorded and the wind speeds are very unlikely. It would be difficult to measure such a tornado as there would be no objects left to study. Some continue to measure tornadoes up to F12 and Mach 1 (the speed of sound) at 761.5 mph (1218.4 kph) but again, this a hypothetical modification of the Fujita Scale. | |

*Source: http://www.spc.noaa.gov/faqtornadolef-scale.htm*

**Location**

Tornadoes may occur anywhere within the planning area.

**Extent**

The magnitude or severity of future tornadoes is likely to be an F0-F1 tornado rating as measured by the Fujita Scale. This is based on previous occurrences of tornadoes in Hardee County. Although not likely, higher intensity tornadoes are possible.

### Previous Occurrences

*March 9, 1998* The NCDC reported that the tornado touched down eleven miles from the City of Wauchula along Steve Roberts Road in rural, semi-wooded swamp and grassland areas. The tornado produced 'F0' damage, leaving downed power lines and trees and causing damage to mobile home roofs. The tornado continued its path into Highlands County.

*June 4, 2004* A tornado caused moderate damage to seven homes, destroyed several buildings at CF Industries, and destroyed part of an orange grove. Much of the damage was near the intersection of State Highway 62 and Baptist Church Road, extending northeast to the intersection of Alderman Road and County Road 664.

**Tornado Occurrences**

- July 14, 1961 (F1)
- June 18, 1971 (F1)
- May 15, 1974 (F0)
- September 15, 1980 (F1)
- April 5, 1993 (F0)
- March 9, 1998 (F0)
- June 4, 2004 (F1)
- July 9, 2005 (F0)

*July 9, 2005* A tornado resulting from Hurricane Dennis destroyed a wood frame home valued at $50,000.

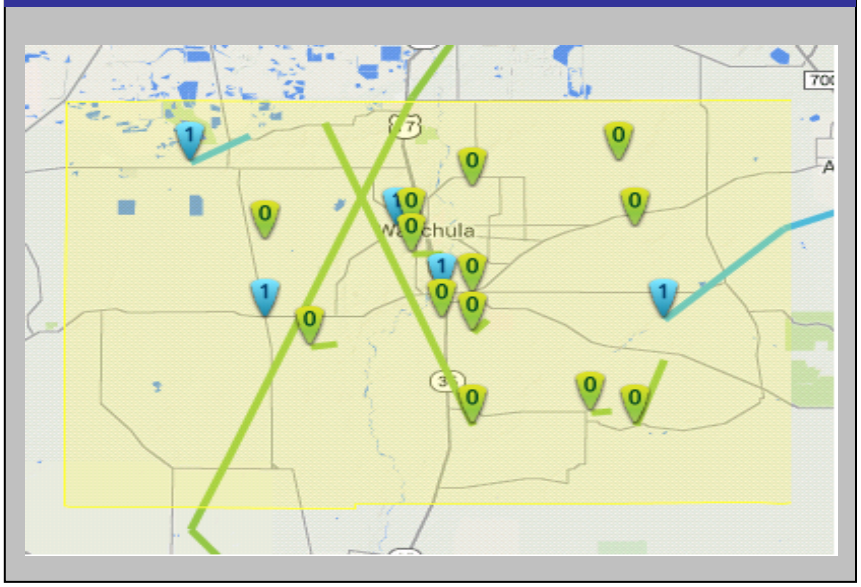
No tornado events have occurred since the July 2005 incident.

Other tornadoes besides those listed in the timeline have been reported in the county, but none have caused damages that have been reported or recorded. A map of all tornadoes (1950-2012) recorded by NOAA's Storm Prediction Center are shown in the map below. The rating of each is based on the Fujita Scale. As of February 1, 2007, all tornadoes will be reported using the Enhanced Fujita Scale.

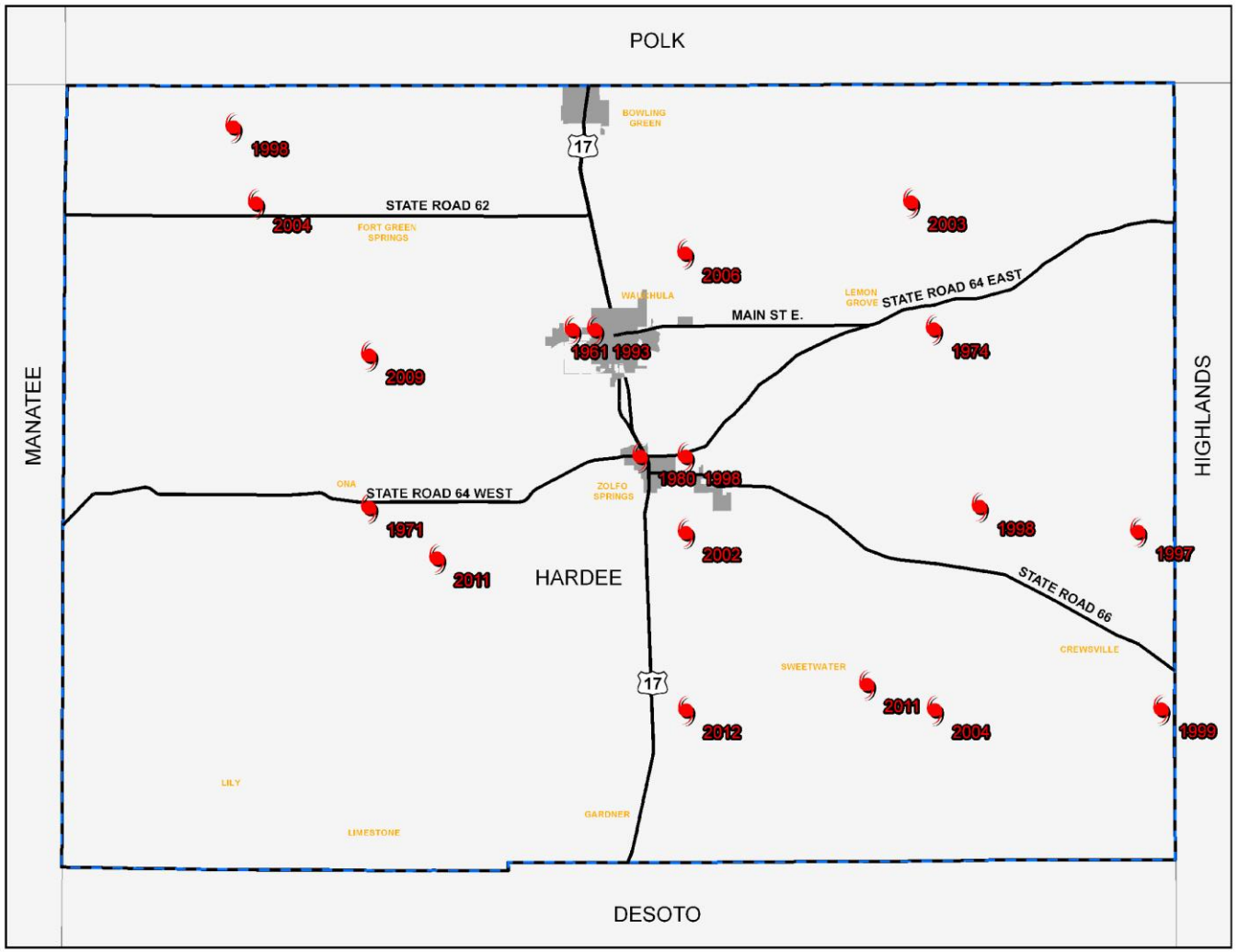
### Probability of Future Events

The probability that tornadoes will occur within the planning area is high. Weaker tornadoes (F0-F1) will likely occur somewhere within the county annually.

**Past Tornado Tracks**




*Source: http://www.tornadohistoryproject.com/tornado.php*




## Legend

- Tornado
- Major Roads
- County Boundary
- Cities

**HARDEE COUNTY HISTORICAL TORNADOES**

September 17, 2014
FILE: \arcm\em\lms\histtornadoes

0 5 10 Miles

Source:
Hardee County Emergency Management
National Weather Service
TornadoHistoryProject.com

N W E S

### Wildfires

Hardee County experiences brush fires and wildland fires annually. The peak time for forest fires is usually during our dry season from January through May of each year. During these months, grass, leaves, pine needles, and underbrush provide optimal conditions that fuel wildfires. Caused by any number of natural and man-made events, wildfires can result in extensive damage to public and private property. Wildfires also threaten the health and safety of citizens in or around the hazard (CEMP). The Center for Disease Control warns that smoke from wildfires can cause eye and respiratory system irritation and can worsen chronic heart and lung diseases.

According to the Florida Forest Service, wildfires are driven by three factors: fuels, weather, and topography. Fuels consist of dead leaves, grasses, pine needles, and branches on the ground along with brush, shrubs, fallen logs, and sometimes trees themselves. The amount and type of available fuel influences how quickly a fire burns, how hot it burns, and how difficult it will be to manage (South Carolina Forestry Commission). The US Geological Survey warns that fire suppression can lead to more severe fires due to the buildup of vegetation which creates more fuel.

**Hardee County Wildfires**

Certain weather conditions can also increase the potential for wildfires and alter fire behavior. Wind speed and direction and low relative humidity (a measure of moisture in the air) can cause wildfires to spread more quickly (South Carolina Forestry Commission). Wildfires are a natural, often beneficial process, but can cause serious impacts to life and property when not properly managed.

### Location

Because Hardee County is rural with much open space, wildfires are possible virtually anywhere within the county that has adequate fuels. Using data from the Florida Forest Service, areas within the county were assigned a wildland fire potential risk of "high," "medium," or "low" based on the fire spreading potential during a climatologically dry year. A map showing areas of "medium" or "high" potential is provided in the Appendix. A map showing locations of wildfires (50 acres or more burned) from January 2004 to September 2014 is provided below.

### Extent

The magnitude or severity of wildfires occurring in the county is likely to be less than 1,000 acres burned based on data of wildfire occurrences from January 1982 through May 2009. No fires over 1,000 acres were reported during that time and only 8 fires were reported that burned between 300-999 acres. Of all reported wildfires that occurred during that time in Hardee County, 96.8 percent burned less than 99 acres (Florida Division of Forestry, 2009).

### Previous Occurrences

*Summer 2000* A 700-acre brush fire in southwest Hardee County near Murphy Road burned by 4.5 hours requiring mutual aid from five agencies. The fire was fueled by grass with palm head crowning.

*February 24, 2004* A 125-acre fire broke out in the Vandolah area. The cause of the fire is unknown.

*March 2, 2006* A 105-acre wildfire broke out after an authorized acreage burn got out of control. The fire was located in a rural area in the southeastern portion of the county.

*January 14, 2008* A 100-acre fire broke out due to unknown causes. The fire was located southeast of the City of Bowling Green in an unincorporated area.

*February 11, 2008* A 150-acre wildfire broke out near Limestone when an authorized acreage burn got out of control.

*February 10, 2009* A fire broke out south of Ona in Unincorporated Hardee County burning 150 acres.

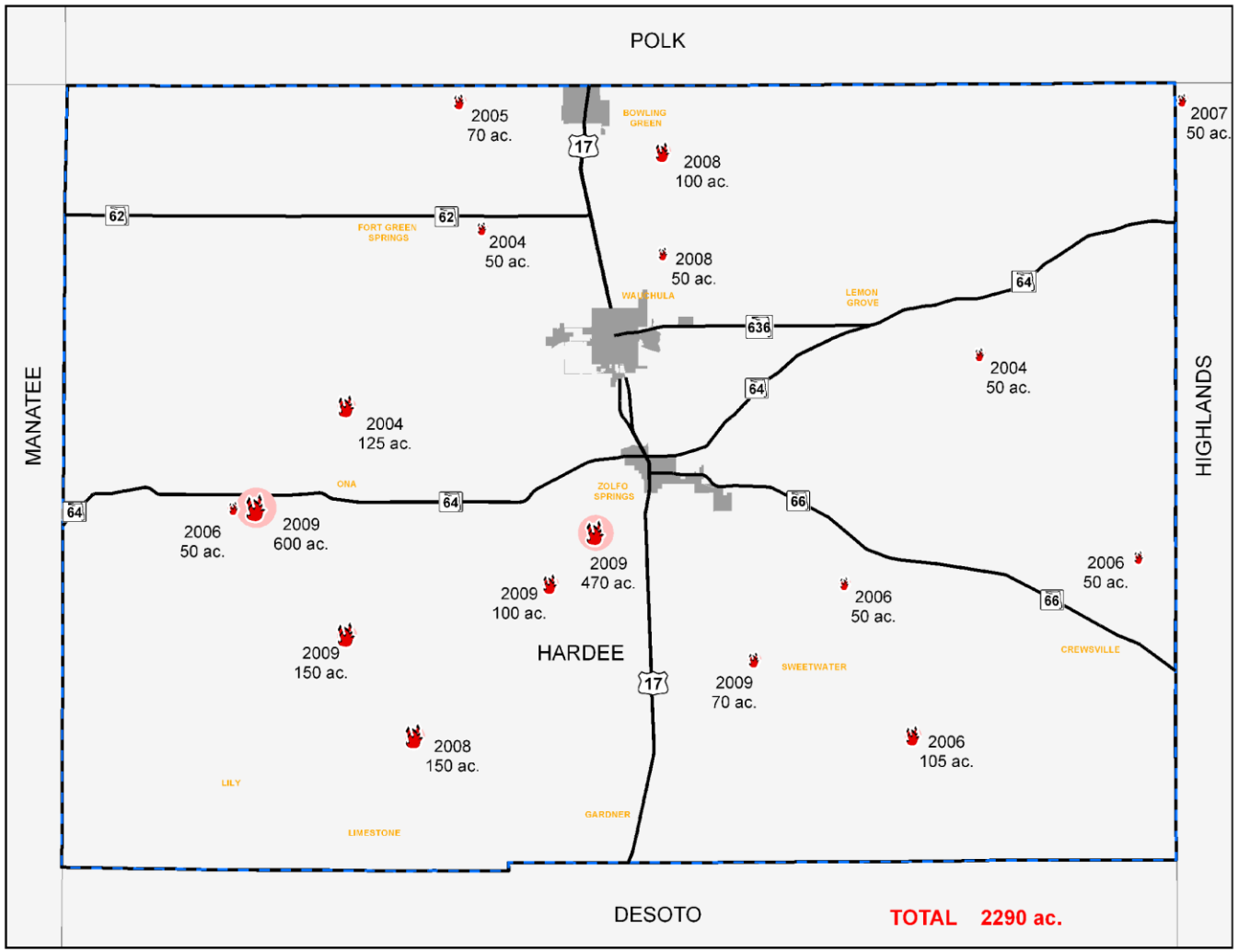
*February 14, 2009* A 470-acre fire broke out southwest of the Town of Zolfo Springs in an unincorporated area. The cause of the fire was determined to be a campfire that was not properly extinguished.

*March 16, 2009* A 600-acre fire broke out in Ona. The cause of the fire was unknown.

No wildfire events have occurred since the March 2009 incident.

### Probability of Future Events

The probability that wildfires will occur in the planning area is high. The frequency of wildfires is likely to more than once a year based on previous occurrences. As mentioned above, those wildfires will most likely be less than 100 acres.




## Legend

**Buff**

- 50 ac.
- 51 ac. - 74 ac.
- 75 ac.- 99 ac.
- 100 ac. - 124 ac.
- 125 ac.- 149 ac.
- 150 ac. - 499 ac.
- 500 ac. - 600 ac.
- WildFire Area
- Roads
- County Boundary
- Cities

**HARDEE COUNTY HISTORICAL WILDFIRES**

0 5 10 Miles

Source:
Florida Division of Forestry

N W E S

September 17, 2014
FILE: lms\projects\floodtotal

## Assessing Vulnerability

### Summary of Vulnerability by Hazard Type and by Jurisdiction

The following is an overview of the community's existing vulnerability to each type of hazard. While flooding, sinkholes, and wildfires are generally confined to certain identified portions of the planning area, the other identified hazards may impact the entire planning area. For this reason, the identified hazard areas are placed into the following four categories: flood vulnerable areas, sinkhole vulnerable areas, wildfire vulnerable areas, and areas vulnerable to all other hazards. The county's risk is assessed by each of these hazard areas and is then broken down by each jurisdiction's vulnerability within a specified hazard area. Certainly some jurisdictions within the county are more vulnerable to certain types of hazards than others. This section satisfies Section 201.6(c)(2)(iii) requiring that multi-jurisdictional plans assess each jurisdiction's risks where they vary from the risks facing the entire planning area.

The vulnerability assessment tables provided in this section were produced using Geographical Information Systems (GIS) data. The county GIS Analyst gathered data sets on building stock, critical facilities, transportation systems, utility systems, communications systems, special consideration areas, historic and cultural assets, natural resource areas, and hazardous material facilities from various sources. This information was compiled using the best and most current available data from the FDEM Sharepoint Portal, the Hardee County Property Appraiser, the Southwest Florida Water Management District, the Florida Division of Emergency Management, the Federal Emergency Management Agency, the Florida Fish and Wildlife Conservation Commission, the Federal Communications Commission, U.S. Census Bureau, the University of Florida's Bureau of Economic and Business Research, the Florida Natural Areas Inventory, the Florida Forest Service, the Florida Department of Health, the National Climatic Data Center, the County Mining Department and other related organizations. Many of the GIS data layers from these organizations were retrieved from the Florida Geographic Data Library's online collection. Combining this data with available local data allowed county staff to identify buildings, facilities, and infrastructure within the identified hazard areas. A list of critical facilities is provided in the Appendix along with maps of highly vulnerable populations, mining waste sites, hazardous material sites, transportation systems, utility systems, and communications towers.

Note that some fields within the vulnerability assessment tables show a '0' value. In some cases, this means that no facilities or infrastructure elements are located within the hazard area. In other instances, a '0' value means that no reasonably accurate estimate of the amount of facilities or infrastructure could be obtained due to the lack of reliable data. For example, data layers for power lines and substations were not available at the time of this plan update, therefore, in those fields a '0' is shown.

It should also be noted that a value of '0' was assigned to the roadways and railways categories under the wildfire vulnerability assessment. This was done because county staff decided that providing a value within that field may present an inaccurate depiction of the county's actual risk. Although roadways and railways themselves are generally not subject to wildfires, when wildfires are present alongside these corridors, transportation through these routes may be inhibited due to smoke or other blockages associated with the fire. The total acreage vulnerable to wildfires was estimated using data from the Florida Forest Service. This system calculated wildfire potential based on a climatologically dry year. Included in the calculations are areas of "medium" and "high" wildfire potential.

The following subsections outline what was determined to be the county's vulnerability to the identified hazards. Following the vulnerability analysis, an overall summary of risks is provided. This was determined by multiplying the probability and frequency of future disaster occurrences with four vulnerability factors. After that, a quantification of potential dollar losses is provided followed by an analysis of development trends that could alter the county's risk over the next planning period.

### Floods

The areas most vulnerable to flooding are areas within the 100 year floodplain, the Bronco Drive area in southern Hardee County, and the Riverview Heights subdivision east of the City of Wauchula. A map showing these areas is provided in the Appendix.

A total of 583 structures are located within the 100 year floodplain. In addition, there are 49.08 miles of roadways and 50 bridges that are in or intersect flood vulnerable areas. Flooding of these routes could cause serious implications for transportation of critical supplies after a disaster event. In addition, there is critical wastewater infrastructure (sewage treatment facilities and lift stations) and a number of private septic tanks located in the floodplain that, if breached, could affect drinking water safety.

As of July 2013, there were 6 repetitive flood loss properties all located within unincorporated Hardee County. Repetitive loss properties are those for which two or more losses of at least $1,000 each have been paid under the National Flood Insurance Program within any 10-year period since 1978. Five of the properties are single family homes and the total payout for their combined claims is approximately $65,742. The sixth repetitive loss property is listed as a condominium and has had 6 claims since 1994. Total payout for those six claims is approximately $190,708.

Using the best available data on structures located within the floodplain, there are an estimated 159 homes, 382 mobiles homes, and 15 commercial-use buildings located in flood-prone areas. Assuming one total loss of each property over a 100-year period, the potential dollar loss is over $47 million. A summary table of these calculations is provided in Table 2.31.

### Sinkholes

The areas determined to be most vulnerable to sinkholes are the areas within a one-half mile radius of previous sinkhole occurrences. These areas are shown on the Sinkhole Vulnerable Areas Map in the Appendix. There are a total of 738 structures located within these areas.

Although sinkholes are not frequent, their occurrence within more populous areas could have substantial impacts. Within the sinkhole vulnerable areas, there are 26.4 miles of roadways, numerous residences, and many historic structures.

Using USGS Florida Geological Survey data the loss percentages over a 100-year period, the total damages expected over that time period are estimated at approximately $2.0 million. A summary of the calculations are provided in Table 2.30.

### Wildfires

The areas most vulnerable to wildfires are shown on the Wildfire Vulnerable Areas Map in the Appendix. These areas were determined to be 'medium' or 'high' areas of wildfire potential based on the fire spreading potential during a climatologically dry year. The values shown in Table 2.13 represent the estimated amount of buildings, facilities, and infrastructure located within the 'medium' or 'high' wildfire potential zones. It is important to recognize that while wildfires may be contained, their associated smoke can impact populations and properties miles away. Like all data in the risk assessment sections of this plan, this information is presented for planning purposed only.

The total number of buildings within wildfire vulnerable areas is 5,944. This includes 26 churches, 35 historic structures, and many residences. There is also several group care facilities located in these zones, where vulnerable populations are housed. Besides buildings, there are also numerous communications towers within those areas that are vulnerable to wildfires. The total building exposure to wildfires is approximately $269.4 million. Assuming a 2.31% loss to each of those buildings over a period of 100 years, the estimated losses exceed $6 million. A summary of these calculations is provided in Table 2.29.

### All Other Hazards

Droughts, extreme heat events, freezes, hurricanes, severe thunderstorms, high winds, and tornados were combined into a single category since the risk of these events occurring within the planning area is uniform. The numbers shown in Table 2.15 reflect estimates of vulnerable structures for the entire planning area. The estimates are calculated on a per-event basis.

Calculations for determining potential dollar losses for hurricanes and high winds are provided after the vulnerability assessment of each jurisdiction. Unlike the impacts of hurricanes and high winds, the impacts of droughts, extreme heat events, and freezes are much more difficult to quantify. As described in the introduction to the risk assessment, the county has large agricultural operations that are at-risk to damage from these natural events. The 2012 Census of Agriculture states that the market value of agricultural products sold was nearly $232 million and the net farm cash income of operation was $91.6 million for Hardee County. Severe weather events can impact these important agricultural operations, however, no impact to buildings or physical infrastructure is likely.

| Table 2.12 Vulnerability Assessment: Floods | |
|---|---|
| **Building Stock** | |
| Total Buildings | 583 |
| **Critical Facilities** | |
| Hospitals | 0 |
| Jails | 0 |
| Correctional Facilities | 0 |
| Police & Fire Stations | 0 |
| Emergency Operations | 0 |
| Evacuation Shelters | 0 |
| Schools | 0 |
| **Transportation Systems** | |
| Airports | 0 |
| Roadways (miles) | 49.08 |
| Railways (miles) | 2.3 |
| Bridges | 50 |
| **Utility Systems** | |
| Potable Water Facilities | 0 |
| Sewage Treatment Facilities | 2 |
| Lift Stations | 0 |
| Solid Waste Facilities | 1 |
| **Communications Systems** | |
| FM Towers | 0 |
| Cellular Antennas | 1 |
| Wireless Antennas | 1 |
| **Highly Vulnerable Populations** | |
| Group Care Facilities | 0 |
| Mobile Home Parks/RV Parks | 2 |
| Mobile Homes | 157 |
| Structures Built Before 1970 | 0 |
| **Historic & Cultural Assets** | |
| Historic Structures | 1 |
| Churches & Religious Centers | 0 |
| Parks and Rec Facilities | 3 |
| **Natural Resource Areas** | |
| Total Land Area (acres) | 91,047 |
| Total Managed Areas (acres) | 667.95 |
| Payne Creek Park | 277 |
| Highlands Hammock | 0 |
| Hardee Lakes | 387 |
| Wildlife Protection Facilities | 3.95 |
| Center for Great Apes | 0 |
| Peace River Refuge | 3.95 |
| **Hazardous Material Facilities** | |
| Tier II Haz Materials Sites | 3 |
| Biomedical Waste Facilities | 1 |
| Septic Tanks | 105 |
| Mining Clay Settling Areas | 0 |

| Table 2.13 Vulnerability Assessment: Wildfires | |
|---|---|
| **Building Stock** | |
| Total Buildings | 5,944 |
| **Critical Facilities** | |
| Hospitals | 0 |
| Jails | 0 |
| Correctional Facilities | 1 |
| Police & Fire Stations | 0 |
| Emergency Operations | 0 |
| Evacuation Shelters | 0 |
| Schools | 0 |
| **Transportation Systems** | |
| Airports | 1 |
| Roadways (miles) | 258.95 |
| Railways (miles) | 15.21 |
| Bridges | 38 |
| **Utility Systems** | |
| Potable Water Facilities | 0 |
| Sewage Treatment Facilities | 1 |
| Lift Stations | 0 |
| Solid Waste Facilities | 1 |
| **Communications Systems** | |
| FM Towers | 1 |
| Cellular Antennas | 9 |
| Wireless Antennas | 7 |
| **Highly Vulnerable Populations** | |
| Group Care Facilities | 1 |
| Mobile Home Parks/RV Parks | 0 |
| Mobile Homes | 470 |
| Structures Built Before 1970 | 942 |
| **Historic & Cultural Assets** | |
| Historic Structures | 35 |
| Churches & Religious Centers | 26 |
| Parks and Rec Facilities | 4 |
| **Natural Resource Areas** | |
| Total Land Area (acres) | 282,134 |
| Total Managed Areas (acres) | 900 |
| Payne Creek Park | 0 |
| Highlands Hammock | 0 |
| Hardee Lakes | 876 |
| Wildlife Protection Facilities | 23.75 |
| Center for Great Apes | 19.80 |
| Peace River Refuge | 3.95 |
| **Hazardous Material Facilities** | |
| Tier II Haz Materials Sites | 8 |
| Biomedical Waste Facilities | 10 |
| Septic Tanks | 0 |
| Mining Clay Settling Areas | 2,443.39 |

| Table 2.14 Vulnerability Assessment: Sinkholes | |
|---|---|
| **Building Stock** | |
| Total Buildings | 738 |
| **Critical Facilities** | |
| Hospitals | 1 |
| Jails | 0 |
| Correctional Facilities | 0 |
| Police & Fire Stations | 0 |
| Emergency Operations | 0 |
| Evacuation Shelters | 0 |
| Schools | 2 |
| **Transportation Systems** | |
| Airports | 0 |
| Roadways (miles) | 28 |
| Railways (miles) | 0 |
| Bridges | 2 |
| **Utility Systems** | |
| Potable Water Facilities | 0 |
| Sewage Treatment Facilities | 0 |
| Lift Stations | 2 |
| Solid Waste Facilities | 0 |
| **Communications Systems** | |
| FM Towers | 0 |
| Cellular Antennas | 0 |
| Wireless Antennas | 1 |
| **Highly Vulnerable Populations** | |
| Group Care Facilities | 6 |
| Mobile Home Parks/RV Parks | 1 |
| Mobile Homes | 85 |
| Structures Built Before 1970 | 0 |
| **Historic & Cultural Assets** | |
| Historic Structures | 38 |
| Churches & Religious Centers | 5 |
| Parks and Rec Facilities | 0 |
| **Natural Resource Areas** | |
| Total Land Area (acres) | 3,862 |
| Total Managed Areas (acres) | 0 |
| Payne Creek Park | 0 |
| Highlands Hammock | 0 |
| Hardee Lakes | 0 |
| Wildlife Protection Facilities | 0 |
| Center for Great Apes | 0 |
| Peace River Refuge | 0 |
| **Hazardous Material Facilities** | |
| Tier II Haz Materials Sites | 0 |
| Biomedical Waste Facilities | 2 |
| Septic Tanks | 0 |
| Mining Clay Settling Areas | 0 |

| Table 2.15 Vulnerability: All Other Hazards | |
|---|---|
| **Building Stock** | |
| Total Buildings | 14,017 |
| **Critical Facilities** | |
| Hospitals | 1 |
| Jails | 1 |
| Correctional Facilities | 1 |
| Police & Fire Stations | 1 |
| Emergency Operations | 0 |
| Evacuation Shelters | 3 |
| Schools | 10 |
| **Transportation Systems** | |
| Airports | 1 |
| Roadways (miles) | 575.45 |
| Railways (miles) | 21.55 |
| Bridges | 66 |
| **Utility Systems** | |
| Potable Water Facilities | 1 |
| Sewage Treatment Facilities | 2 |
| Lift Stations | 8 |
| Solid Waste Facilities | 1 |
| **Communications Systems** | |
| FM Towers | 2 |
| Cellular Antennas | 16 |
| Wireless Antennas | 10 |
| **Highly Vulnerable Populations** | |
| Group Care Facilities | 24 |
| Mobile Home Parks/RV Parks | 25 |
| Mobile Homes | 1,312 |
| Structures Built Before 1970 | 4,250 |
| **Historic & Cultural Assets** | |
| Historic Structures | 613 |
| Churches & Religious Centers | 78 |
| Parks and Rec Facilities | 9 |
| **Natural Resource Areas** | |
| Total Land Area (acres) | 407,473 |
| Total Managed Areas (acres) | 1,683.75 |
| Payne Creek Park | 399 |
| Highlands Hammock | 0 |
| Hardee Lakes | 1,261 |
| Wildlife Protection Facilities | 23.75 |
| Center for Great Apes | 19.80 |
| Peace River Refuge | 3.95 |
| **Hazardous Material Facilities** | |
| Tier II Haz Materials Sites | 50 |
| Biomedical Waste Facilities | 45 |
| Septic Tanks | 1,696 |
| Mining Clay Settling Areas | 4,851 |

| Table 2.16 Vulnerability Summary: Unincorporated Hardee County, Existing | | | | |
|---|---|---|---|---|
| **Type** | **Floods** | **Sinkholes** | **Wildfires** | **All Other Hazards** |
| **Building Stock** | | | | |
| Total Buildings | 583 | 947 | 1921 | 5,944 |
| **Critical Facilities** | | | | |
| Hospitals | 0 | 0 | 0 | 0 |
| Jails | 0 | 0 | 0 | 0 |
| Correctional Facilities | 0 | 0 | 1 | 1 |
| Police & Fire Stations | 0 | 0 | 0 | 1 |
| Emergency Operations | 0 | 0 | 0 | 0 |
| Evacuation Shelters | 0 | 0 | 2 | 3 |
| Schools | 0 | 0 | 0 | 10 |
| **Transportation Systems** | | | | |
| Airports | 0 | 0 | 1 | 1 |
| Roadways (miles) | 49.08 | 22.4 | 258.95 | 615.0 |
| Railways (miles) | 2.3 | 0.0 | 15.21 | 21.55 |
| County Bridges | 50 | 3 | 38 | 66 |
| **Utility Systems** | | | | |
| Potable Water Facilities | 0 | 0 | 0 | 1 |
| Sewage Treatment Facilities | 2 | 0 | 1 | 2 |
| Lift Stations | 0 | 0 | 0 | 8 |
| Solid Waste Facilities | 1 | 0 | 1 | 1 |
| **Communications Systems** | | | | |
| FM Towers | 0 | 0 | 1 | 2 |
| Cellular Antennas | 1 | 1 | 9 | 16 |
| Wireless Antennas | 1 | 0 | 7 | 10 |
| **Highly Vulnerable Populations** | | | | |
| Group Care Facilities | 0 | 1 | 1 | 10 |
| Mobile Home Parks/RV Parks | 2 | 1 | 0 | 15 |
| Mobile Homes | 157 | 85 | 470 | 1,111 |
| Structures Built Before 1970 | 0 | 0 | 942 | 2,724 |
| **Historic & Cultural Assets** | | | | |
| Historic Structures | 1 | 0 | 27 | 52 |
| Churches & Religious Centers | 0 | 0 | 19 | 40 |
| Parks and Recreation Facilities | 3 | 0 | 3 | 8 |
| **Natural Resource Areas** | | | | |
| Total Land Area (acres) | 91,047 | 0 | 282,134 | 407,473 |
| Total Managed Areas | 667.95 | 0 | 899.75 | 1,683.75 |
| Payne Creek Park | 277 | 0 | 0 | 399 |
| Highlands Hammock | 0 | 0 | 0 | 0 |
| Hardee Lakes | 387 | 0 | 876 | 1,261 |
| Wildlife Protection Facilities | 3.95 | 0 | 23.75 | 23.75 |
| Center for Great Apes | 0 | 0 | 19.80 | 19.80 |
| Peace River Refuge & Ranch | 3.95 | 0 | 3.95 | 3.95 |
| **Hazardous Material Facilities** | | | | |
| Tier II Hazardous Materials Sites | 3 | 0 | 8 | 34 |
| Biomedical Waste Facilities | 1 | 2 | 10 | 19 |
| Septic Tanks | 105 | 0 | 0 | 1629 |
| Mining Clay Settling Areas | 0 | 0 | 2,443.39 | 4,851 |

| Table 2.17 Vulnerability Summary: City of Wauchula, Existing | | | | |
|---|---|---|---|---|
| **Type** | **Floods** | **Sinkholes** | **Wildfires** | **All Other Hazards** |
| **Building Stock** | | | | |
| Total Buildings | 33 | 207 | 133 | 2,028 |
| **Critical Facilities** | | | | |
| Hospitals | 0 | 1 | 0 | 1 |
| Jails | 0 | 0 | 0 | 1 |
| Correctional Facilities | 0 | 0 | 0 | 0 |
| Police & Fire Stations | 0 | 0 | 0 | 2 |
| Emergency Operations | 0 | 0 | 0 | 1 |
| Evacuation Shelters | 0 | 1 | 0 | 1 |
| Schools | 0 | 1 | 0 | 4 |
| **Transportation Systems** | | | | |
| Airports | 0 | 0 | 0 | 0 |
| Roadways (miles) | 1.85 | 4 | 0 | 39.6 |
| Railways (miles) | 0 | 0 | 0 | 0 |
| County Bridges | 0 | 0 | 0 | 0 |
| **Utility Systems** | | | | |
| Potable Water Facilities | 0 | 0 | 0 | 1 |
| Sewage Treatment Facilities | 1 | 0 | 0 | 1 |
| Lift Stations | 3 | 2 | 5 | 16 |
| Solid Waste Facilities | 0 | 0 | 0 | 0 |
| **Communications Systems** | | | | |
| FM Towers | 0 | 0 | 0 | 0 |
| Cellular Antennas | 0 | 0 | 0 | 0 |
| Wireless Antennas | 0 | 0 | 0 | 0 |
| **Highly Vulnerable Populations** | | | | |
| Group Care Facilities | 0 | 5 | 0 | 13 |
| Mobile Home Parks/RV Parks | 0 | 0 | 0 | 1 |
| Mobile Homes | 0 | 0 | 0 | 36 |
| Structures Built Before 1970 | 0 | 0 | 0 | 786 |
| **Historic & Cultural Assets** | | | | |
| Historic Structures | 0 | 38 | 7 | 554 |
| Churches & Religious Centers | 0 | 0 | 1 | 22 |
| Parks and Recreation Facilities | 3 | 0 | 0 | 0 |
| **Natural Resource Areas** | | | | |
| Total Land Area (acres) | 231 | 157 | 0 | 2,042 |
| Total Managed Areas | 0 | 0 | 0 | 0 |
| Wildlife Protection Facilities | 0 | 0 | 0 | 0 |
| **Hazardous Material Facilities** | | | | |
| Tier II Hazardous Materials Sites | 3 | 0 | 0 | 11 |
| Biomedical Waste Facilities | 0 | 6 | 0 | 20 |
| Septic Tanks | 22 | 0 | 0 | 39 |
| Mining Clay Settling Areas | 0 | 0 | 0 | 0 |

| Table 2.18 Vulnerability Summary: City of Bowling Green, Existing | | | | |
|---|---|---|---|---|
| **Type** | **Floods** | **Sinkholes** | **Wildfires** | **All Other Hazards** |
| **Building Stock** | | | | |
| Total Buildings | 30 | 0 | 526 | 1,608 |
| **Critical Facilities** | | | | |
| Hospitals | 0 | 0 | 0 | 0 |
| Jails | 0 | 0 | 0 | 0 |
| Correctional Facilities | 0 | 0 | 0 | 0 |
| Police & Fire Stations | 0 | 0 | 1 | 2 |
| Emergency Operations | 0 | 0 | 0 | 0 |
| Evacuation Shelters | 0 | 0 | 0 | 1 |
| Schools | 0 | 0 | 0 | 1 |
| **Transportation Systems** | | | | |
| Airports | 0 | 0 | 0 | 0 |
| Roadways (miles) | 0.71 | 0 | 5.47 | 18.7 |
| Railways (miles) | 0 | 0 | 0 | 0 |
| County Bridges | 0 | 0 | 0 | 0 |
| **Utility Systems** | | | | |
| Potable Water Facilities | 0 | 0 | 0 | 1 |
| Sewage Treatment Facilities | 0 | 0 | 0 | 1 |
| Lift Stations | 1 | 0 | 1 | 3 |
| Solid Waste Facilities | 1 | 0 | 0 | 0 |
| **Communications Systems** | | | | |
| FM Towers | 0 | 0 | 0 | 0 |
| Cellular Antennas | 0 | 0 | 0 | 1 |
| Wireless Antennas | 0 | 0 | 0 | 0 |
| **Highly Vulnerable Populations** | | | | |
| Group Care Facilities | 0 | 1 | 0 | 1 |
| Mobile Home Parks/RV Parks | 0 | 0 | 0 | 3 |
| Mobile Homes | 3 | 0 | 22 | 67 |
| Structures Built Before 1970 | 0 | 0 | 162 | 420 |
| **Historic & Cultural Assets** | | | | |
| Historic Structures | 0 | 0 | 0 | 1 |
| Churches & Religious Centers | 0 | 0 | 2 | 8 |
| Parks and Recreation Facilities | 0 | 0 | 0 | 0 |
| **Natural Resource Areas** | | | | |
| Total Land Area (acres) | 30 | 0 | 0 | 801 |
| Total Managed Areas | 0 | 0 | 0 | 0 |
| Wildlife Protection Facilities | 0 | 0 | 0 | 0 |
| **Hazardous Material & High Potential Loss Facilities** | | | | |
| Tier II Hazardous Materials Sites | 0 | 0 | 0 | 2 |
| Biomedical Waste Facilities | 0 | 0 | 1 | 1 |
| Septic Tanks | 0 | 0 | 0 | 12 |
| Mining Clay Settling Areas | 0 | 0 | 0 | 0 |

| Table 2.19 Vulnerability Summary: Town of Zolfo Springs, Existing | | | | |
|---|---|---|---|---|
| **Type** | **Floods** | **Sinkholes** | **Wildfires** | **All Other Hazards** |
| **Building Stock** | | | | |
| Total Buildings | 165 | 0 | 124 | 1,161 |
| **Critical Facilities** | | | | |
| Hospitals | 0 | 0 | 0 | 0 |
| Jails | 0 | 0 | 0 | 0 |
| Correctional Facilities | 0 | 0 | 0 | 0 |
| Police & Fire Stations | 0 | 0 | 0 | 2 |
| Emergency Operations | 0 | 0 | 0 | 0 |
| Evacuation Shelters | 0 | 0 | 0 | 1 |
| Schools | 0 | 0 | 0 | 1 |
| **Transportation Systems** | | | | |
| Airports | 0 | 0 | 0 | 0 |
| Roadways (miles) | 5.4 | 0 | 1.47 | 20.8 |
| Railways (miles) | 0 | 0 | 0 | 0 |
| County Bridges | 0 | 0 | 0 | 0 |
| **Utility Systems** | | | | |
| Potable Water Facilities | 0 | 0 | 0 | 1 |
| Sewage Treatment Facilities | 0 | 0 | 1 | 1 |
| Lift Stations | 1 | 0 | 2 | 6 |
| Solid Waste Facilities | 0 | 0 | 0 | 0 |
| **Communications Systems** | | | | |
| FM Towers | 0 | 0 | 0 | 0 |
| Cellular Antennas | 0 | 0 | 0 | 0 |
| Wireless Antennas | 0 | 0 | 0 | 0 |
| **Highly Vulnerable Populations** | | | | |
| Group Care Facilities | 0 | 0 | 0 | 0 |
| Mobile Home Parks/RV Parks | 1 | 0 | 2 | 6 |
| Mobile Homes (not in Parks) | 11 | 0 | 30 | 43 |
| Structures Built Before 1970 | 0 | 0 | 54 | 320 |
| **Historic & Cultural Assets** | | | | |
| Historic Structures | 0 | 0 | 1 | 6 |
| Churches & Religious Centers | 0 | 0 | 4 | 8 |
| Parks and Recreation Facilities | 1 | 0 | 1 | 1 |
| **Natural Resource Areas** | | | | |
| Total Land Area (acres) | 155 | 0 | 0 | 1,115 |
| Total Managed Areas | 0 | 0 | 0 | 0 |
| Wildlife Protection Facilities | 0 | 0 | 0 | 0 |
| **Hazardous Material & High Potential Loss Facilities** | | | | |
| Tier II Hazardous Materials Sites | 0 | 0 | 1 | 6 |
| Biomedical Waste Facilities | 0 | 0 | 0 | 1 |
| Septic Tanks | 2 | 0 | 0 | 16 |
| Mining Clay Settling Areas | 0 | 0 | 0 | 0 |

### Overall Risk Summary

Risk is determined by calculating the probability of occurrence, the vulnerability to the impacts of an occurrence, and the distribution of impacts. The overall risk for Hardee County was calculated by adding the probability/frequency and distribution of each hazard type to the average of four different categories of vulnerability. Those categories are the likelihood of injury or death, amount of economic losses, severity of environmental damages, and likelihood and length of service disruptions (per each disaster event). Each category was assigned a variable based on predetermined scales. After calculating the overall risk, the totals were further assigned a low (0-8.9), medium (9-10.9), or high (11+) risk. These risk values were categorized using natural breaks in the overall risk score. All values shown are based on statistical data from various sources in addition to anecdotal evidence and eyewitness accounts.

Using this method, the county and each municipality are assumed to be highly at-risk to hurricanes/tropical storms and flooding. The county and each municipality are moderately at-risk to severe thunderstorms, freezes, and droughts/extreme heat. The county and each municipality are least at-risk to tornadoes and wildfires. Although it is unlikely that the City of Bowling Green and the Town of Zolfo Springs will experience a sinkhole occurrence, county-wide the risk of sinkhole occurrence is low. These findings and an explanation of the risk variables are provided in the tables below.

**Table 2.20 Risk Summary of Identified Hazards**

| | Probability Frequency | Vulnerability | | | | Distribution | Overall Risk |
|---|---|---|---|---|---|---|---|
| | | Injury or Death | Economic Loss | Environ. Damage | Service Interruption | | |
| Drought/Extreme Heat | 4 | 2 | 2 | 3 | 1 | 3 | 9 |
| Floods | 5 | 2 | 4 | 3 | 3 | 3 | 11 |
| Freezes | 4 | 1 | 3 | 3 | 1 | 3 | 9 |
| Hurricanes/Tropical Storms | 4 | 3 | 5 | 4 | 5 | 5 | 13.25 |
| Severe Thunderstorms | 5 | 2 | 2 | 1 | 4 | 3 | 10.25 |
| Sinkholes | 1 | 1 | 2 | 3 | 1 | 1 | 3.75 |
| Tornadoes | 4 | 2 | 3 | 1 | 3 | 1 | 7.25 |
| Wildfires | 5 | 2 | 3 | 3 | 2 | 1 | 8.5 |

| Table 2.21 Risk Variables | |
|---|---|
| **Probability/Frequency** | |
| 1 | Less than once every 10 years |
| 2 | About once every 5-10 years |
| 3 | About once every 2-5 years |
| 4 | About once a year |
| 5 | More than once a year |
| **Vulnerability: Injury or Death** | |
| 1 | Death very unlikely, injuries are unlikely |
| 2 | Death unlikely, injuries are minimal |
| 3 | Death unlikely, injuries may be substantial |
| 4 | Death possible, injuries may be substantial |
| 5 | Deaths probable, injuries will be substantial |
| **Vulnerability: Economic Loss** | |
| 1 | Less than $500 |
| 2 | $500-2000 |
| 3 | $2000-10000 |
| 4 | $10000-100000 |
| 5 | More than $100000 |
| **Vulnerability: Environmental Damage** | |
| 1 | None likely |
| 3 | Somewhat likely |
| 5 | Very likely |
| **Vulnerability: Service Disruption** | |
| 1 | No disruption |
| 2 | Not very likely |
| 3 | Somewhat likely, for a limited amount of time |
| 4 | Very likely, for a limited amount of time |
| 5 | Very likely, for an extended period of time |
| **Distribution of Impacts** | |
| 1 | Impacts are localized |
| 3 | Impacts are interspersed |
| 5 | Impacts are countywide |

### Potential Dollar Loss Estimates

Inputs for these estimates were derived from the 2014 Hardee County Property Appraiser Data & HAZUS-MH building stock data. The loss estimates were found by calculating the overall exposure to an identified hazard using the Property Appraiser data on the current number and value, (average replacement cost new), of single-family residential, multi-family residential, mobile home, commercial, agricultural (dairy barns only), government, and institutional structures. Utilizing FEMA's Department of Homeland Security's loss estimation methodology for natural hazards, (HAZUS-MH), a potential dollar loss was calculated for Hardee County.

As indicated by each table, some loss values are estimates per hazard event. In other cases, the loss values represent the total expected loss over a 100-year period. Note that these figures do not include many agricultural-type and accessory structures such as barns. This has resulted in a lower overall loss estimate than will potentially be expected. For the next five-year update, updated hazard maps (specifically Flood Insurance Rate Maps) should be available. Additional Property Appraiser data on agricultural and accessory structures may also be available at the time of the next plan update which will allow more accurate loss estimates. Droughts, extreme heat, and freezes are excluded from this section because they rarely impact structures. Tornadoes and thunderstorms are also excluded from this section because of the high degree of variability of impacts.

### FEMA Hazus MH - General Description of the Region (Hardee County)

The geographical size of the region is 639.38 square miles and contains 4 census tracts. There are over 8 thousand households in the region and has a total population of 27,731 people (2010 Census Bureau data).

There are an estimated 7 thousand buildings in the region with a total building replacement value (excluding contents) of 1,762 million dollars (2006 dollars). Approximately 75% of the buildings (and 55% of the building value) are associated with residential housing.

### Building Inventory

General Building Stock

Hazus estimates that there are 7,963 buildings in the region which have an aggregate total replacement value of 1,762 million (2006 dollars). Table 2.22 presents the relative distribution of the value with respect to the general occupancies.

**Table 2.22: Building Exposure By Occupancy Type**

| Occupancy | Exposure ($1,000) | Percent of Total |
|---|---|---|
| Residential | 968,701 | 55.00% |
| Commercial | 198,462 | 17.90% |
| Industrial | 23,038 | 11.30% |
| Agricultural | 116,130 | 0.50% |
| Religious | 316,177 | 7.50% |
| Government | 8,204 | 1.30% |
| Education | 131,553 | 6.60% |
| Total | 8,204 | 100.00% |

**Building Damage: 10 Year Event**

General Building Stock Damage:

Hazus estimates that about 3 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. Table 2.23 below summarizes the expected damage by general occupancy for the buildings in the region. Table 2.24 summarizes the expected damage by general building type.

**Table 2.23: Expected Building Damage By Occupancy: 10 Year Event**

| | None | | Minor | | Moderate | | Severe | | Destruction | |
|---|---|---|---|---|---|---|---|---|---|---|
| Occupancy | Count | % | Count | % | Count | % | Count | % | Count | % |
| Agriculture | 1,427 | 99.13 | 11 | 0.8 | 1 | 0.05 | 0 | 0.01 | 0 | 0 |
| Commercial | 312 | 99.43 | 2 | 0.56 | 0 | 0.01 | 0 | 0 | 0 | 0 |
| Education | 12 | 99.56 | 0 | 0.44 | 0 | 0 | 0 | 0 | 0 | 0 |
| Government | 65 | 99.41 | 0 | 0.58 | 0 | 0 | 0 | 0 | 0 | 0 |
| Industrial | 62 | 99.34 | 0 | 0.66 | 0 | 0.01 | 0 | 0 | 0 | 0 |
| Religion | 109 | 99.55 | 0 | 0.45 | 0 | 0 | 0 | 0 | 0 | 0 |
| Residential | 5,944 | 99.69 | 16 | 0.28 | 2 | 0.03 | 0 | 0 | 0 | 0 |
| Total | 7,931 | | 29 | | 3 | | 0 | | 0 | |

**Table 2.24: Expected Building Damage By Building Type: 10 Year Event**

| | None | | Minor | | Moderate | | Severe | | Destruction | |
|---|---|---|---|---|---|---|---|---|---|---|
| Occupancy | Count | % | Count | % | Count | % | Count | % | Count | % |
| Concrete | 312 | 99.17 | 3 | 0.82 | 0 | 0.01 | 0 | 0 | 0 | 0 |
| Masonry | 3,394 | 99.45 | 17 | 0.49 | 2 | 0.05 | 0 | 0.01 | 0 | 0 |
| MH | 1,418 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Steel | 716 | 99.13 | 6 | 0.86 | 0 | 0.01 | 0 | 0 | 0 | 0 |
| Wood | 2,086 | 99.68 | 6 | 0.29 | 0 | 0.02 | 0 | 0 | 0 | 0 |
| Total | 7,926 | | 32 | | 2 | | 0 | 0 | 0 | 0 |

**Economic Loss: 10 Year Event**

The total economic loss estimated for the hurricane is 1.5 million dollars, which represents 0.09 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 2 million dollars. 6% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 93% of the total loss. Table 2.25 below provides a summary of the losses associated with the building damage.

**Table 2.25: Building Related Economic Loss Estimates: 10 Year Event**

| **Category: Property Damage** | | | | | |
|---|---|---|---|---|---|
| Area | Residential | Commercial | Industrial | Others | Total |
| Building | 1,139.06 | 22.14 | 3.15 | 84.17 | 1,248.52 |
| Content | 205.72 | 0 | 0 | 0 | 205.72 |
| Inventory | 0 | 0 | 0 | 0 | 0 |
| Subtotal | 1,344.78 | 22.14 | 3.15 | 84.17 | 1,454.24 |
| **Category: Business Interruption Loss** | | | | | |
| Area | Residential | Commercial | Industrial | Others | Total |
| Income | 0 | 0 | 0 | 0 | 0 |
| Relocation | 27.82 | 0.06 | 0.03 | 0.16 | 28.07 |
| Rental | 19.86 | 0 | 0 | 0 | 19.86 |
| Wage | 0 | 0 | 0 | 0 | 0 |
| Subtotal | 47.86 | 0.06 | 0.03 | 0.16 | 48.11 |
| **Combined Totals** | **1,392.46** | **22.20** | **3.18** | **84.33** | **1,502.35** |

**Building Damage: 20 Year Event**

General Building Stock Damage:

Hazus estimates that about 28 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. Table 2.26 below summarizes the expected damage by general occupancy for the buildings in the region. Table 2.27 summarizes the expected damage by general building type.

**Table 2.26: Expected Building Damage By Occupancy: 20 Year Event**

| | None | | Minor | | Moderate | | Severe | | Destruction | |
|---|---|---|---|---|---|---|---|---|---|---|
| Occupancy | Count | % | Count | % | Count | % | Count | % | Count | % |
| Agriculture | 1,370 | 95.21 | 56 | 3.90 | 9 | 0.65 | 3 | 0.22 | 0 | 0 |
| Commercial | 305 | 97.03 | 9 | 2.74 | 1 | 0.22 | 0 | 0.01 | 0 | 0 |
| Education | 12 | 97.45 | 0 | 2.42 | 0 | 0.13 | 0 | 0 | 0 | 0 |
| Government | 63 | 97.17 | 2 | 2.64 | 0 | 0.18 | 0 | 0 | 0 | 0 |
| Industrial | 60 | 96.82 | 2 | 2.92 | 0 | 0.24 | 0 | 0.01 | 0 | 0 |
| Religion | 106 | 97.20 | 3 | 2.64 | 0 | 0.16 | 0 | 0 | 0 | 0 |
| Residential | 5,810 | 97.46 | 137 | 2.30 | 14 | 0.23 | 0 | 0.01 | 0 | 0 |
| Total | 7,726 | | 209 | | 24 | | 3 | | 0 | |

**Table 2.27: Expected Building Damage By Building Type: 20 Year Event**

| | None | | Minor | | Moderate | | Severe | | Destruction | |
|---|---|---|---|---|---|---|---|---|---|---|
| Occupancy | Count | % | Count | % | Count | % | Count | % | Count | % |
| Concrete | 303 | 96.10 | 11 | 3.58 | 1 | 0.31 | 0 | 0 | 0 | 0 |
| Masonry | 3,290 | 96.39 | 101 | 2.97 | 18 | 0.51 | 4 | 0.12 | 0 | 0.01 |
| MH | 1,417 | 99.90 | 1 | 0.08 | 0 | 0.02 | 0 | 0 | 0 | 0.01 |
| Steel | 695 | 96.26 | 24 | 3.39 | 2 | 0.34 | 0 | 0.01 | 0 | 0 |
| Wood | 2,029 | 96.92 | 61 | 2.93 | 3 | 0.14 | 0 | 0.01 | 0 | 0 |
| Total | 7,734 | | 198 | | 24 | | 4 | | 0 | |

**Economic Loss: 20 Year Event**

The total economic loss estimated for the hurricane is 7.0 million dollars, which represents 0.40 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 7 million dollars. 9% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 89% of the total loss. Table 2.28 below provides a summary of the losses associated with the building damage.

**Table 2.28: Building Related Economic Loss Estimates: 20 Year Event**

| **Category: Property Damage** | | | | | |
|---|---|---|---|---|---|
| Area | Residential | Commercial | Industrial | Others | Total |
| Building | 5,064.11 | 103.99 | 14.75 | 520.15 | 5,702.99 |
| Content | 802.02 | 7.59 | 1.27 | 61.01 | 871.89 |
| Inventory | 0 | 0.72 | 0.97 | 13.23 | 14.92 |
| Subtotal | 5,866.13 | 112.30 | 16.99 | 594.38 | 6,589.80 |
| **Category: Business Interruption Loss** | | | | | |
| Area | Residential | Commercial | Industrial | Others | Total |
| Income | 0 | 0.29 | 0.04 | 0 | 0.33 |
| Relocation | 208.69 | 3.12 | 1.56 | 62.30 | 275.67 |
| Rental | 164.09 | 0.13 | 0.04 | 20.06 | 166.32 |
| Wage | 0 | 0.10 | 0.07 | 0 | 0 |
| Subtotal | 372.78 | 3.64 | 1.71 | 64.36 | 442.49 |
| **Combined Totals** | **6,238.91** | **115.93** | **18.71** | **658.74** | **7,032.29** |

**Building Damage: 50 Year Event**

General Building Stock Damage:

Hazus estimates that about 339 buildings will be at least moderately damaged. This is over 4% of the total number of buildings in the region. There are an estimated 15 buildings that will be completely destroyed. Table 2.29 below summarizes the expected damage by general occupancy for the buildings in the region. Table 2.30 summarizes the expected damage by general building type.

**Table 2.29: Expected Building Damage By Occupancy: 50 Year Event**

| | None | | Minor | | Moderate | | Severe | | Destruction | |
|---|---|---|---|---|---|---|---|---|---|---|
| Occupancy | Count | % | Count | % | Count | % | Count | % | Count | % |
| Agriculture | 1,029 | 71.52 | 259 | 17.97 | 97 | 6.75 | 47 | 3.30 | 7 | 0.46 |
| Commercial | 265 | 84.35 | 35 | 11.24 | 12 | 3.91 | 2 | 0.48 | 0 | 0.02 |
| Education | 11 | 89.47 | 1 | 8.67 | 0 | 1.78 | 0 | 0.08 | 0 | 0 |
| Government | 55 | 84.03 | 8 | 11.57 | 3 | 3.85 | 0 | 0.54 | 0 | 0 |
| Industrial | 51 | 82.31 | 8 | 12.22 | 3 | 4.61 | 1 | 0.84 | 0 | 0.02 |
| Religion | 93 | 84.88 | 13 | 11.85 | 3 | 2.90 | 0 | 0.37 | 0 | 0 |
| Residential | 5,103 | 85.59 | 696 | 11.67 | 147 | 2.47 | 8 | 0.14 | 8 | 0.14 |
| Total | 6,606 | | 1,019 | | 265 | | 59 | | 15 | |

**Table 2.30: Expected Building Damage By Building Type: 50 Year Event**

| | None | | Minor | | Moderate | | Severe | | Destruction | |
|---|---|---|---|---|---|---|---|---|---|---|
| Occupancy | Count | % | Count | % | Count | % | Count | % | Count | % |
| Concrete | 253 | 80.36 | 41 | 13.15 | 18 | 5.82 | 2 | 0.68 | 0 | 0 |
| Masonry | 2795 | 81.91 | 424 | 12.43 | 129 | 3.79 | 54 | 1.59 | 10 | 0.28 |
| MH | 1394 | 98.29 | 14 | 0.96 | 7 | 0.51 | 0 | 0.02 | 3 | 0.22 |
| Steel | 562 | 77.77 | 100 | 13.91 | 50 | 6.97 | 10 | 1.34 | 0 | 0.01 |
| Wood | 1684 | 80.47 | 358 | 17.11 | 47 | 2.23 | 3 | 0.16 | 1 | 0.04 |
| Total | 6688 | | 937 | | 251 | | 69 | | 14 | |

**Economic Loss: 50 Year Event**

The total economic loss estimated for the hurricane is 33.2 million dollars, which represents 1.88 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 33 million dollars. 28% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 66% of the total loss. Table 2.31 below provides a summary of the losses associated with the building damage.

**Table 2.31: Building Related Economic Loss Estimates: 50 Year Event**

| **Category: Property Damage** | | | | | |
|---|---|---|---|---|---|
| Area | Residential | Commercial | Industrial | Others | Total |
| Building | 16,805.88 | 997.25 | 165.36 | 6,061.89 | 24,030.88 |
| Content | 3,530.00 | 207.85 | 36.98 | 1,326.21 | 5,101.04 |
| Inventory | 0 | 17.98 | 38.36 | 269.57 | 325.91 |
| Subtotal | 20,335.88 | 1,223.08 | 240.69 | 7,657.68 | 29,457.33 |
| **Category: Business Interruption Loss** | | | | | |
| Area | Residential | Commercial | Industrial | Others | Total |
| Income | 0.26 | 43.47 | 6.26 | 71.21 | 121.20 |
| Relocation | 939.39 | 181.79 | 55.67 | 1,047.41 | 2,224.27 |
| Rental | 567.36 | 96.06 | 7.62 | 71.09 | 742.13 |
| Wage | 0.61 | 85.62 | 9.00 | 573.29 | 668.52 |
| Subtotal | 1,507.63 | 406.93 | 78.55 | 1,763.00 | 3,756.11 |
| **Combined Totals** | **21,843.50** | **1,630.02** | **319.24** | **9,420.68** | **33,213.44** |

**Building Damage: 100 Year Event**

General Building Stock Damage:

Hazus estimates that about 973 buildings will be at least moderately damaged. This is over 12% of the total number of buildings in the region. There are an estimated 52 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2.32 below summarizes the expected damage by general occupancy for the buildings in the region. Table 2.33 summarizes the expected damage by general building type.

**Table 2.32: Expected Building Damage By Occupancy: 100 Year Event**

| | None | | Minor | | Moderate | | Severe | | Destruction | |
|---|---|---|---|---|---|---|---|---|---|---|
| Occupancy | Count | % | Count | % | Count | % | Count | % | Count | % |
| Agriculture | 923 | 64.16 | 299 | 20.80 | 133 | 9.26 | 71 | 4.94 | 12 | 0.85 |
| Commercial | 163 | 51.78 | 71 | 22.64 | 60 | 18.97 | 20 | 6.28 | 1 | 0.34 |
| Education | 6 | 46.48 | 3 | 23.97 | 3 | 21.42 | 1 | 8.12 | 0 | 0 |
| Government | 34 | 52.54 | 15 | 22.32 | 12 | 18.45 | 4 | 6.69 | 0 | 0 |
| Industrial | 34 | 55.53 | 13 | 21.57 | 10 | 16.81 | 4 | 6.06 | 0 | 0.03 |
| Religion | 59 | 53.72 | 29 | 26.71 | 16 | 15.03 | 5 | 4.54 | 0 | 0 |
| Residential | 3,809 | 63.89 | 1,532 | 25.69 | 510 | 8.56 | 72 | 1.21 | 39 | 0.66 |
| Total | 5,028 | | 1,962 | | 744 | | 177 | | 52 | |

**Table 2.33: Expected Building Damage By Building Type: 50 Year Event**

| | None | | Minor | | Moderate | | Severe | | Destruction | |
|---|---|---|---|---|---|---|---|---|---|---|
| Occupancy | Count | % | Count | % | Count | % | Count | % | Count | % |
| Concrete | 165 | 52.35 | 66 | 21.03 | 65 | 20.79 | 18 | 5.83 | 0 | 0 |
| Masonry | 1,934 | 56.67 | 937 | 27.46 | 384 | 11.24 | 128 | 3.76 | 30 | 0.87 |
| MH | 1,368 | 96.50 | 23 | 1.61 | 17 | 1.21 | 1 | 0.10 | 8 | 0.58 |
| Steel | 451 | 62.48 | 129 | 17.87 | 104 | 14.39 | 37 | 5.13 | 1 | 0.13 |
| Wood | 1,287 | 61.49 | 630 | 30.10 | 152 | 7.27 | 17 | 0.79 | 7 | 0.33 |
| Total | 5,205 | | 1,785 | | 722 | | 201 | | 46 | |

**Economic Loss: 100 Year Event**

The total economic loss estimated for the hurricane is 105.2 million dollars, which represents 5.97 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 105 million dollars. 25% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 60% of the total loss. Table 2.34 below provides a summary of the losses associated with the building damage.

**Table 2.34: Building Related Economic Loss Estimates: 100 Year Event**

| **Category: Property Damage** | | | | | |
|---|---|---|---|---|---|
| Area | Residential | Commercial | Industrial | Others | Total |
| Building | 43,440.15 | 8,923.89 | 704.81 | 16,247.18 | 69,316.03 |
| Content | 12,826.50 | 2,587.49 | 186.66 | 4,008.19 | 19,608.85 |
| Inventory | 0 | 235.62 | 151.44 | 478.51 | 865.57 |
| Subtotal | 56,266.66 | 11,747.00 | 10,42.91 | 20,733.88 | 89,790.45 |
| **Category: Business Interruption Loss** | | | | | |
| Area | Residential | Commercial | Industrial | Others | Total |
| Income | 80.72 | 145.71 | 20.58 | 242.11 | 489.12 |
| Relocation | 4,548.69 | 1,662.27 | 280.67 | 3,028.88 | 9,520.50 |
| Rental | 2,068.94 | 901.17 | 41.05 | 428.73 | 3,439.89 |
| Wage | 190.24 | 325.41 | 24.12 | 1,461.52 | 2,001.30 |
| Subtotal | 6,888.58 | 3,034.55 | 366.43 | 5,161.24 | 15,450.81 |
| **Combined Totals** | **63,155.24** | **14,781.55** | **1,409.34** | **25,895.13** | **105,241.26** |

| Table 2.35 Wildfire | | | | |
|---|---|---|---|---|
| **Estimated Loss Percents over 100 Year Period** | | | | |
| | | Exposure | Damage | Dollar Loss |
| Type of Structure | Number of Structures | Value of Structures | Percent | (Total Exposure x Percent Damage) |
| Single-Family Residential | 1,200 | $ 114,097 | 2.31% | $ 3,162,768 |
| Mobile Homes | 1,257 | $45,225 | 2.31% | $ 1,313,188 |
| Multi-Family Residential | 0 | $ 133,951 | 2.31% | $0 |
| Commercial | 100 | $ 153,951 | 2.31% | $ 335,627 |
| Agriculture (Dairy Only) | 0 | $ 134,760 | 2.31% | $0 |
| Government | 18 | $ 4,638,009 | 2.31% | $ 1,928,484 |
| Institutional | 26 | $ 235,381 | 2.31% | $ 141,370 |
| Total | 2,601 | | | $ 6,901,437 |

**These values are estimates of the number of each type of structure within the designated wildfire vulnerable areas based on the total number of structures located within those areas. The total excludes RVs and mobile homes in parks.*

| Table 2.36 Sinkhole | | | | |
|---|---|---|---|---|
| **Estimated Loss Percents over 100 Year Period** | | | | |
| | | Exposure | Damage | Dollar Loss |
| Type of Structure | Number of Structures | Value of Structures | Percent | (Total Exposure x Percent Damage) |
| Single-Family Residential | 550 | $ 114,097 | 2.29% | $ 1,437,051 |
| Mobile Homes | 84 | $ 45,225 | 2.17% | $82,436 |
| Multi-Family Residential | 11 | $ 133,951 | 2.42% | $35,658 |
| Commercial | 22 | $ 153,951 | 2.29% | $77,561 |
| Agriculture (Dairy Only) | 0 | $ 134,760 | 2.49% | $0 |
| Government | 6 | $ 4,638,009 | 2.35% | $ 653,959 |
| Institutional | 5 | $ 235,381 | 2.35% | $27,657 |
| Total | 678 | | | $ 2,314,322 |

*Source: US Inflation Calculator*

**These values are estimates of the number of each type of structure within the designated sinkhole vulnerable area based on the total number of structures located within that area. The total excludes RVs and mobile homes in parks.*

| Table 2.37 100 Year Flood Event | | | | |
|---|---|---|---|---|
| **Only Includes Structures Within 100 Year Floodplain** | | | | |
| | | Exposure | Damage | Dollar Loss |
| Type of Structure | Number of Structures* | Value of Structures | Percent | (Total Exposure x Percent Damage) |
| Single-Family Residential | 159 | $ 114,097 | 100.0% | $ 18,141,423 |
| Mobile Homes | 382 | $ 45,225 | 100.0% | $ 17,275,950 |
| Multi-Family Residential | 25 | $ 133,951 | 100.0% | $0 |
| Commercial | 15 | $ 153,951 | 100.0% | $ 2,309,265 |
| Agriculture (Dairy Only) | 0 | $ 134,760 | 100.0% | $0 |
| Government | 2 | $ 4,638,009 | 100.0% | $ 9,276,018 |
| Institutional | 0 | $ 235,381 | 100.0% | $0 |
| Total | 583 | | | $ 47,002,656 |

**These values are estimates of the number of each type of structure within the 100 year floodplain based on the total number of structures located within that area. The total excludes RVs and mobile homes in parks.*

### Development Trends and Future Vulnerability

Using variations of extrapolation and ratio techniques along with contextual knowledge of recent growth trends, county staff was able to project future county populations. The table below shows six different population projection series. The year 2020 projections range from 26,800 to 32,100.

Despite heavy growth in recent years, the state as a whole is currently experiencing stagnant and in some cases negative growth. The county is expected to continue its historic slow population growth. Some large-scale developments have been proposed within the past few years, but local and national conditions have prevented commencement of those projects. As such conditions persist, intense development within the county is not expected. In addition, there are currently no large infrastructure projects or critical facilities planned within the county that would alter the county's overall vulnerability.

Although heavy development is unlikely, maps of current zoning and future land uses are provided in the appendix. These maps help illustrate the possible location and type of future development if and when it does occur.

**Table 2.38 Hardee County Population Growth Projections 2020**

| Year | Actual Population (US Census) | Extrapolation Projections | | | County-to-State Ratio Projections | | |
|---|---|---|---|---|---|---|---|
| | | Linear | Logistic w/ Upper Limit | Parabolic | Constant Share | Shift Share | Share of Growth |
| 1950 | 10,073 | | | | | | |
| 1960 | 12,370 | | | | | | |
| 1970 | 14,889 | | | | | | |
| 1980 | 20,357 | | | | | | |
| 1990 | 19,499 | | | | | | |
| 2000 | 26,938 | | | | | | |
| 2010 | 27,731 | | | | | | |
| 2020 | 29,400 | 31,649 | 33,715 | 35,426 | 32,132 | 38,600 | 34,070 |

*Source: BEBR March 2010 Projections of Florida Populations by County 2009-2035*

The county does recognize that any population growth will increase its overall exposure to natural and man-made hazards. Mitigation projects and programs are identified in later sections of the plan that will help address future vulnerability.

# Section 3. Mitigation Strategy

*44 CFR 201.6(c)3: The plan shall include a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, polices, programs, and resources, and its ability to expand on and improve these existing tools. This section shall include:*

*(i) A description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.*

*(ii) A section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.*

*(iii) An action plan describing how those actions will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.*

*(iv) For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.*

### Mitigation Goals

Goal 1: Reduced vulnerability and exposure of lives and property to the impacts of natural disasters.

Objective 1.1: Maximize the protection of the public's health, safety, and welfare as they are related to natural disasters.

Objective 1.2: Reduce the loss of personal and public property due to natural disasters.

Objective 1.3: Require the protection of natural resources (such as environmentally sensitive lands) in order to maximize their mitigative benefits and to safeguard them from damage caused by natural disasters.

Objective 1.4: Ensure that Hardee County's code and ordinances are sufficient to protect public safety and property.

Objective 1.5: Develop advance plans for the safe evacuation of all vulnerable county residents.

Objective 1.6: Ensure mitigation measures are effectively incorporated in the comprehensive system of coordinated planning, management, and land acquisition.

Objective 1.7: Employ mitigation strategies such as demolition, reconstruction, acquisition, wind retrofit, flood-proofing, and elevation to reduce vulnerability.

Goal 2: Strong intergovernmental coordination between Hardee County Emergency Management and local, state, and federal agencies.

Objective 2.1: Implement disaster training programs and exercises.

Objective 2.2: Pre-establish and update a network of state and local contacts to coordinate Hardee County needs.

Objective 2.3: Establish and protect the essential flow of information before, during, and after a disaster.

Objective 2.4: Encourage cooperation and participation between and among all Hardee County departments in mitigation planning.

Objective 2.5: Ensure that the Hardee County Hazard Mitigation Plan incorporates appropriate hazard mitigation measures as reflected in each agency Emergency Support Function or Departmental Standard Operating Procedures.

Goal 3: Reduced vulnerability of critical facilities and public facilities to natural disasters.

Objective 3.1: Disaster-proof existing and proposed critical facilities, in regards to location and construction.

Objective 3.2: Develop and maintain energy preparedness plans that will be both practical and effective under circumstances of disrupted energy supplies.

Objective 3.3: Incorporate hazard mitigation measures in any rehabilitation or reuse of existing public facilities, structures, and buildings..

Goal 4: Improved planning for post-disaster recovery and mitigation.

Objective 4.1: Analyze, review and update Hardee County post-disaster, recovery, and mitigation plans.

Goal 5: Increased public awareness and participation in hazard preparedness, response, mitigation, and recovery.

Objective 5.1: Develop and maintain a comprehensive, multi-media/multi-lingual public education campaign on emergency preparedness, response, mitigation, and recovery.

Objective 5.2: Establish coordinated information and procedures for public information officers and media working in disasters.

Goal 6: Protection of unique natural habitats and ecological systems that naturally mitigate hazards.

Objective 6.1: Conserve forests, wetlands, and other natural features to maintain their economic, aesthetic, and recreational values.

Objective 6.2: Acquire, retain, manage, and inventory public lands to provide conservation and related public benefits including hazard mitigation.

Objective 6.3: Promote the use of agricultural practices that are compatible with the protection of natural systems.

Objective 6.4: Encourage multiple use of forest resources, where appropriate, to provide for watershed protection and erosion and maintenance of water quality.

Objective 6.5: Protect and restore the ecological functions of wetland systems to ensure their long-term environmental, economic, and recreational values, including hazard mitigation practices.

Objective 6.6: Develop and implement a comprehensive planning, management, and acquisition program to ensure the integrity of Hardee County's waterways.

Objective 6.7: Emphasize the acquisition and maintenance of ecologically intact systems in all land and water planning, management, and regulation.

### Identification and Implementation of Mitigation Actions

For each hazard that Hardee County and its municipalities are vulnerable to, a comprehensive range of mitigation actions have been identified. These mitigation projects and programs are designed to reduce vulnerability of new and existing buildings and infrastructure to the impacts of natural and man-made events. To date, a number of mitigation actions have been successfully completed. A number of completed mitigation activities are listed below.

1. The City of Wauchula Public Works installed valves to prevent sewage backups at Crews Park in January of 1998.
2. The City of Bowling Green has obtained two portable electric generators for operating lift stations during extended power outages. Three additional generators are located at the potable water plant, the sewage treatment plant, and the well field.
3. The City of Wauchula has obtained a standby electrical generator for Lift Station #3, which is the most vulnerable lift station during times of extended power outages. There are also backup generators at the potable water plant and wastewater treatment plant.
4. Hardee County Fire Rescue (Main Station) has a backup generator.
5. Hardee County has two backup generators.
6. Hardee County Public Works began a storm drainage upgrade program of installing additional culverts in July 1998. This project is ongoing.
7. The EAS LP-1 covers three radio stations (including a Spanish-speaking station). The Sheriff and City municipal law enforcement vehicles are equipped with loudspeakers.
8. Hardee County Emergency Management provides Florida DEM and FEMA information pamphlets.
9. Hardee County Emergency Management continues to participate in local and statewide preparedness exercises. Emergency Management staff continue to seek training and education opportunities as they arise
10. Hardee County School Board requires 10 drills per school for either fire or tornado.
11. Hardee County has a complete adopted Emergency Management Plan.
12. The exterior brick at the Hardee County Courthouse Annex was re-pointed and sealed to prevent water intrusion.
13. A Communitywide Wildfire Protection Plan was created.
14. The Town Hall in Zolfo Springs was retrofitted with shutters.
15. A stem wall was constructed around Hardee County Courthouse Annex II to prevent flooding.
16. Maintenance activities such as ditch clearing and culvert cleaning have been ongoing. These types of activities help prevent localized flooding caused by clogged culvert crossings and ditches.
17. Hardee County Fire Rescue Station 1 has been retrofitted and an Automatic Transfer Switch has been installed.
18. The Hardee County Sheriff's Department drainage project has been completed.
19. The City of Wauchula has installed a lightning arrestor at the Historic City Hall Building.

From retrofitting facilities to providing information to the public, these projects and programs demonstrate the county's commitment to reducing it's vulnerability to all hazards

through mitigation. A list of additional completed mitigation projects that were identified in the 2010 LMS are included in the appendix. However, some mitigation actions identified in the previous LMS were not completed. In some instances, the incomplete projects were simply removed from list either because they are no longer a community priority or because applications for those projects were denied under various hazard mitigation assistance programs. Other projects were deferred due to lack of funding and limited staffing for project administration and management. Those deferred projects continue to be a community priority and will be completed during the next planning period as funding and staff become available.

The task of hazard mitigation is ongoing and mitigation projects and programs will continue to be added and prioritized as necessary. The process for prioritizing projects and programs will be done using the SAFE-T method. The SAFE-T method is a rating system developed by county staff that uses five variables to evaluate the overall feasibility and appropriateness of mitigation programs and projects. The five variables are Societal, Administrative, Financial, Environmental, and Technical. When necessary, a more detailed cost-benefit analysis will be conducted.

**Table 3.1 SAFE-T Method**

| Variable | | Value | Description |
|---|---|---|---|
| **S** | **Societal:** The public must support the overall implementation strategy and specified mitigation actions. The projects will be evaluated in terms of community acceptance and societal benefits. | **1** | Low community priority, few societal benefits |
| | | **2** | Moderate community acceptance/priority |
| | | **3** | High community acceptance/priority |
| **A** | **Administrative:** The projects will be evaluated for anticipated staffing and maintenance requirements to determine if the jurisdiction has the personnel and administrative capabilities necessary to implement the project or whether outside help will be needed. | **1** | High staffing, outside help needed |
| | | **2** | Some staffing, help may be needed |
| | | **3** | Low staffing, no outside help needed |
| **F** | **Financial:** The projects will be evaluated on their general cost-effectiveness and whether additional outside funding will be required. | **1** | Somewhat cost-effective |
| | | **2** | Moderately cost-effective |
| | | **3** | Very cost-effective |
| **E** | **Environmental:** The projects will be evaluated for any immediate or long-term environmental impacts caused by their construction or operation. | **1** | Many environ. impacts, possibly long-term |
| | | **2** | Some environ. impacts, some possibly long-term |
| | | **3** | Few, if any, environ. impacts |
| **T** | **Technical:** The projects will be evaluated on their ability to reduce losses in the long-term, whether there are secondary impacts, and whether the proposed project solves the associated problem or if additional components are necessary. | **1** | Other actions are needed or short-term fix |
| | | **2** | Other actions may be needed for long-term fix |
| | | **3** | Other actions not needed, long-term fix |

As projects and programs are identified and evaluated based on the above criteria, a department will be assigned to administer and implement each project, potential funding sources will be documented, and a timeframe for completion will be established. A list of current/deferred projects and a list of completed/deleted projects are provided in the Appendix. The current list of projects and programs has been prioritized using the SAFE-T method and those scores are provided in the Appendix. Further described in the plan maintenance section, this list will be updated annually in compliance with Florida Administrative Rule 27P-22. In addition to actual mitigation programs and projects, two other areas of this plan require actions by the county and its municipalities: continued compliance with the National Flood Insurance Program and integration of mitigation into planning mechanisms. The next section of this plan addresses the former.

### National Flood Insurance Program Compliance

Hardee County is particularly vulnerable to flooding. To help alleviate the economic costs of flooding for homeowners, Hardee County and each of its municipalities participate in the National Flood Insurance Program. FEMA describes the National Flood Insurance Program as a federal program enabling property owners in participating communities to purchase insurance for protection against flood losses in exchange for community floodplain management regulations that reduce future flood damages. Participation in the NFIP requires an agreement between communities and the federal government that stipulates if a community adopts and enforces a floodplain management ordinance to reduce future flood risk to new construction in floodplains, then the federal government will make flood insurance available within the community. This insurance is designed to provide an alternative to disaster assistance to reduce the rising costs of repairing damage to buildings and their contents caused by floods (2002). While many projects and programs have been identified to alleviate the impacts caused by flooding, each jurisdiction within the county has evaluated their participation in the NFIP and has identified and prioritized action items for continuing participation and compliance with this program. A summary of each jurisdiction's participation in the NFIP is described below followed by a prioritized list of action items.

For Hardee County (unincorporated), the County Planning & Development Director is the designated Floodplain Administrator. The county has 96 policies in force for a total insured value of $16 million. There have been a total of 37 claims, 27 of which were paid out for a total of $406,289. The county is ranked 10 in the Community Rating System. Hardee County's adopted floodplain management ordinance states that for new construction within the 100 year floodplain the lowest floor cannot be elevated lower than the base flood elevation. The County Comprehensive Plan also incorporates floodplain management in sections C2.4 and C4.4. Section C2.4 requires that new structures along Peace River, Charlie Creek, Payne Creek, and Horse Creek be built at least one foot above the Base Flood Elevation. Section C4.4 provides protection to wetlands from development impacts. Floodplain management has been integrated into other planning mechanisms, as well. The Long-Term Recovery Plan includes a provision to develop a storm water and flood protection plan to assist in planning infrastructure, land use, and land development.

The City of Wauchula joined the NFIP under the Emergency Program on July 28, 1975. The City became a Regular Program member on June 25, 1976. The Emergency Program is the initial phase of community participation and was designed to provide a limited amount of insurance at less than actuarial rates. A community participating in the Emergency Program either does not have an identified and mapped flood hazard or has been provided with a Flood Hazard Boundary Map, and the community is required to adopted limited floodplain management standards. A community participating in the Regular Program is usually provided with a Flood Insurance Rate Map and a detailed Flood Insurance Study. Under the Regular Program, more

comprehensive floodplain management requirements are imposed in exchange for higher amounts of flood insurance coverage.

In the City of Wauchula, there are a total of 16 insurance policies with a value of $3.4 million. Since 1978, there has only been one claim that totaled $2,706. There are no repetitive loss properties within its jurisdiction. The City Manager, designated as the Floodplain Administrator, met with FEMA on the last Community Assistance Visit on October 24, 2008. A floodplain management ordinance was adopted in 1982 that has since been incorporated into the Land Development Code and Comprehensive Plan. The City of Wauchula does not participate in the Community Rating System.

The City of Bowling Green joined the NFIP in December of 1974 under emergency status and appointed the office of the City Manager as the designated Floodplain Administrator. The City later became a regular participant on May 4, 1988, the effective date of the adopted maps. The City has four policies in force for a total insured amount of $679,600. There have been no claims reported. The last Community Assistance Contact was October 24, 2008 and the last Community Assistance Visit was July 20, 1990. No problems were identified during either. The City does not participate in the Community Rating System and has no repetitive loss properties.

The Town of Zolfo Springs has designated the Town Manager as the Floodplain Administrator. The community has a total of 8 policies currently in force with a total insured value of $1,036,500. Since 1978, there have been only two claims made. Both were paid for a total of $17,003. After Tropical Storm Fay on October 24, 2008, Zolfo received a Field Community Assistance Contact by FEMA. Prior to that, the last Community Assistance Visit occurred on July 12, 2005. At that time, only minor recommendations were made regarding the revision of the floodplain ordinance. The Town of Zolfo Springs does not participate in the Community Rating System and has no repetitive loss properties. A table summarizing NFIP policy, claim, and loss information for each jurisdiction is provided below.

**Table 3.2 National Flood Insurance Program Statistics**

| | Hardee County | City of Wauchula | City of Bowling Green | Town of Zolfo Springs |
|---|---|---|---|---|
| Number of Policies In-Force | 96 | 16 | 4 | 8 |
| Insured Building & Contents Value | $16,033,100 | $3,400,000 | $679,600 | $1,036,500 |
| Total Premiums Paid | 46,491 | 6,575 | 0 | 3,542 |
| Total Claims | 37 | 1 | 0 | 2 |
| Total Claims Paid | 27 | 1 | 0 | 2 |
| Claims Closed Without Payment | 10 | 0 | 0 | 0 |
| Total Payments | $406,289 | $2,706 | $0 | $17,003 |
| CRS Class | 10 | n/a | n/a | n/a |

*Source: http://www.fema.gov/business/nfip/statistics/pcstat.shtm*

According to the countywide Flood Map Modernization Outreach Plan, the only and current FIRM for the participating communities (including Hardee) is the FIRM that became effective on May 4, 1988. Wauchula has the same current effective map date; however, its first FIRM was June 25, 1976 (important for determining pre/post-FIRM buildings). As part of FEMA's Flood Map Modernization process, these 20-year old maps were updated as of November 2013, with SWFWMD acting as a Cooperating Technical Partner, guiding the remapping process. SWFWMD will be incorporating new LiDAR data and aerials and performing historical (142 square miles) and redelineations (388 square miles), except where the detailed studies are being performed. Those areas are located in the center of the county and near Peace River and the northwestern corner of the county. As part of the county and each jurisdictions continued participation in the NFIP, the following actions have been identified, analyzed, and prioritized:

1. Hardee County and each of its municipalities will continue to enforce their adopted Floodplain Management Ordinances which regulate development within the 100-year floodplain.
2. Hardee County and each of its municipalities will continue to provide information to the public on the National Flood Insurance Program.
3. Hardee County will continue to participate in the NFIP Biennial Reports.
4. Hardee County will contribute with the Southwest Florida Water Management District for the management of the Digital Flood Insurance Rate Maps.
5. After the map modernization project is complete, Hardee County and each of its municipalities will review and revise their floodplain ordinances accordingly.

# Section 4. Plan Maintenance

*44 CFR 201.6(c)4: The plan shall include a plan maintenance process that includes:*

*(i) A section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.*

*(ii) A process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.*

*(iii) Discussion on how the community will continue public participation in the plan maintenance process.*

## Monitoring, Evaluating, and Updating

The Hardee County Office of Emergency Management and the LMS Working Group are designated to monitor and evaluate the LMS. The LMS Working Group, as described in F.A.C. 27P-22, is the group responsible for the development and implementation of the Local Mitigation Strategy. The Working Group, at a minimum, shall include representation from 1) various agencies of county government, 2) all participating jurisdictions within the county, and 3) interested private organizations, civic organizations, homeowners associations, water management districts, regional planning councils, and/or non-profit organizations. The Working Group will 1) designate a Chairperson and Vice-Chairperson, 2) develop and revise the LMS as necessary, 3) coordinate mitigation activities within the county, and 4) set an order of priority for local mitigation projects.

The plan will be evaluated annually or after any significant disaster causing property loss, evacuation for a number of citizens, etc or a Level I emergency. A Level I emergency is defined as any extraordinary occurrence of such magnitude that all county and city departments and resources must be utilized or where a combination of county and city departments and outside agencies have been mobilized to handle the situation.

After each annual informal evaluation, any proposed revision will be brought before the LMS Working Group to be incorporated into the LMS. This informal update will address the requirements in F.A.C. 9G-22.004(1) and (4)e which state that no later than the last working weekday of January of each year the Chairperson of the Board of County Commissioners shall submit to the Florida Division of Emergency Management a list of the members of the Working Group and its designated Chairperson and Vice-Chairperson. The update will also address changes to the hazard assessment, the proposed project priority list, the critical facilities list, and the repetitive loss list, and revisions to any maps.

A formal update will be conducted every five years in accordance with 44 CFR 201.6(d)3 which states that plans must be reviewed, revised if appropriate, and resubmitted for approval within five years in order to continue to be eligible for HMGP project grant funding. For these five-year updates, the Hardee County Office of Emergency Management will also serve as the lead agency assisted by the LMS Working Group. Approximately one year prior to the plan's expiration date, Emergency Management staff will begin the formal update process by notifying the county and municipal governments that the current LMS will be updated. This review will entail evaluation of successful and pending mitigation activities, review of current LMS Working Group membership, analysis of the existing risk assessment, and determining if monitoring and updating procedures have been adequate for maintaining the plan. Six months prior to the plan's expiration date, the Hardee County Office of Emergency Management will submit the revised LMS to the Florida Division of Emergency Management for preliminary review. Upon approval by the state, FDEM will submit the updated LMS to FEMA for formal review and approval.

### Conflict Resolution

When conflicts arise over the priority or desirability of any of the local mitigation strategies, the conflict shall be referred back to the LMS Working Group to resolve by a majority vote. Local elected officials may choose to make final decisions in cases of unresolved conflicts. The steps will be:

1. Any member of the Working Group map contact the Working Group Chairperson to request a meeting to resolve a current or potential conflict with the LMS.
2. Before the Working Group meets, the member shall distribute a written description and explanations of the actual or potential conflict, and a recommendation for its resolution. To be consistent, the written description should also include the adopted Hardee County Intergovernmental Policies as all entities participated with the formation of those policies.
3. The Working Group shall meet and allow the petitioning member to present the potential or actual conflict and the suggested resolution.
4. The LMS Chairperson shall allow every member of the Working Group to ask questions and make recommendations.
5. The Working Group shall, by majority vote, recommend a resolution to the parties involved.
6. The recommended resolution shall stand unless the elected body of the governmental entities involved wish to exercise an option to make a final decision. The involved local governments should follow any procedural requirements in the intergovernmental coordination element of their adopted Comprehensive Plan.

### Incorporation into Planning Mechanisms

After the previous plan adoption, each jurisdiction was tasked with developing a process for incorporating the LMS into planning mechanisms such as comprehensive growth management plans, comprehensive emergency management plans, local floodplain ordinances, storm water management policies, and local building codes. Since the initial adoption of the LMS in 2005, it has been incorporated into the Hardee County Comprehensive Emergency Management Plan through its formal adoption within the Mitigation Annex and LMS projects have been referenced in the Community Wildfire Protection Plan.

As mentioned in the Plan Implementation section, the integration of mitigation into the comprehensive planning process requires action by the county and each municipality. Under 44 CFR §201.6(c)(4)(ii), the LMS must contain a process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate. To accomplish this, a review and analysis of relevant existing local planning documents was conducted including the Hardee County Comprehensive Plan, Land Development Regulations, Comprehensive Emergency Management Plan, and the Community Wildfire Protection Plan. Afterwards, the following list of recommendations was compiled as a guide to more successfully integrate hazard mitigation policies and initiatives into various existing planning mechanisms. Some of these recommendations were adapted from those laid out in the Florida Department of Community Affairs' "Integrating Hazard Mitigation into Comprehensive Planning" report for Hardee County and in the Hardee County Comprehensive Emergency Management Plan.

1. The Comprehensive Plan could include a goal that aims to promote education of hazard mitigation related information to the public and to county personnel.
2. Coordinate road construction and maintenance work on designated evacuation routes so as not to inhibit traffic flow during evacuations.

3. The Comprehensive Plan can encourage new single-family and multi-family homes to include safe rooms.
4. The Comprehensive Plan could include a policy that requires all new county-owned critical facilities to be built to a higher code and that requires existing county-owned critical facilities located in hazard vulnerable areas to be retrofitted or relocated.
5. Design standards could be developed for gas stations located along evacuation routes which require them to be pre-wired for generators.
6. A policy within the Comprehensive Plan could be developed that requires parcels located in high hazard areas, if having buildings substantially damaged by natural disaster events, to be converted to less intense land uses.
7. A policy within the Comprehensive Plan could be developed for streamlining the regulatory permitting process during post-disaster response and recovery. This is detailed further in the Emergency Temporary Housing Annex to the Comprehensive Emergency Management Plan.
8. The floodplain management ordinance could include a cumulative substantial damage and improvement limit for all structures in the special flood hazard area.
9. A policy within the Comprehensive Plan could be established that requires the identification of sites for staging areas and stockpiling for public works and utilities. Policies and procedures for doing so are detailed in the County Logistics Plan.
10. A policy could be established which requires the provision of an auxiliary power supply at all new key utilities and facilities.
11. A local ordinance could be adopted and implemented which will govern the installation of hazardous materials storage containers not currently regulated, including residential propane tanks, to minimize the impact of flood and fire hazards.
12. A comprehensive landscape code suitable for county use could be developed, adopted, and implemented. The landscape code can require the use of plant materials which are drought-tolerant, freeze-resistant, and fire-resistant. The landscape code can also require that development within the wildland-urban interface be designed with a minimum of 30 feet of defensible space.

## Continued Public Participation

As in the past, the LMS Working Group will strive to involve the public and gain consensus on local mitigation activities. To increase the level of public awareness, copies of the LMS will be available electronically on the county's website (www.hardeecounty.net) and hard copies will be located at the Emergency Operations Center, the Hardee County Public Library, and at the offices of each of the participating municipalities. In addition, local print media will be used to post public meetings, notices will be posted on the county website, and surrounding county and regional agencies will be notified of any developments with the LMS.

The LMS Working Group will continue to seek input from the public by having, at minimum, bi-annual public meetings in which the plan will be monitored for progress. Meetings will be posted on the county website and posted in the local newspaper. The public will have opportunity to comment during re-drafting stage and prior to any plan approval. In addition, education regarding the Local Mitigation Strategy will be pursued at special events in which the county participates, including the county fair, Pioneer Park Days, and presentations at local schools.

Copies of public notices for meetings held throughout the year are provided below.

# Regular Meeting Notices

## ***Notices Via Agenda's/ Sign-In-Sheets:***

**Hardee County Local Mitigation Strategy (LMS) Meeting**
**July 06, 2010**

**AGENDA**

**I. Welcome and Introductions**

**II. EOC Report**
- **A.)Emergency Operations Center Activities**
- **B.)Deepwater Horizon Update**
- **C.)Atlantic Hurricane Season 2010 Update**

**III. Current Projects**
- **A.)HCFR Station I**

**IV. Other Reports**
- **A.)SWFWMD**
- **B.)DOF**

**V. Election of Chairman and Vice-Chairman**

**VI. Dismissal**
- **A.)Next meeting date – Tuesday, October 05, 2010**

**Thank you for attending today's meeting.**

**HARDEE COUNTY EOC**

| | |
|---|---|
| Re: | *LMS* |
| Date: | *June 13, 2011* |
| Time: | *10:00 AM* |
| Location: | *EOC* |

| Print Name | Email Address | Contact # | Agency |
|---|---|---|---|
| Richard Shepard | Rrichard.Shepard@hardeecounty.net | 773-6373 | EOC |
| Jill Newman | Jill.Newman@hardeecounty.net | 773-6373 | EOC |
| Amalia Arista | Amalia.Arista@hardeecounty.net | 773-6373 | EOC |
| Chief Michael Choate | Michael.Choate@hardeecounty.net | 773-4362 | Fire Rescue |
| Olivia Minshew | ominshew@cityofwauchula.com | 773-5153 | COW |
| | | | |

Local Mitigation Strategy Committee Meeting

Monday, June 13, 2011

Hardee EOC

I. Welcome and Introductions
II. Review of Current Projects
   a. Fire Rescue Station 1 Wind Retrofit
   b. Residential Construction Mitigation Grant
III. Pre-Disaster Mitigation Application
IV. Hurricane Season 2011 Discussion
V. Open discussion, schedule next meeting, adjourn

## *Notices Via Public Notices:*

### PUBLIC NOTICE

The Office of Hardee County Emergency Management has scheduled a Local Mitigation Strategy (LMS) meeting on May 30, 2012, at 9:30 a.m., located at the Emergency Operations Center, 404 West Orange Street, Wauchula, FL 33873.

The purpose of a local mitigation strategy is to reduce the human, environmental, and economic costs of disasters. Mitigation is any action taken to permanently reduce or eliminate long-term risks to people and their property from the effects of disasters.

The goal of the LMS meeting will be to identify specific steps to be taken to reduce the impacts of various natural hazards, the timing of those steps, potential funding sources, their priority within the community, and the entities responsible for implementing each of them.

As we enter the 2012 Hurricane Season and near the 8-year anniversary of Hurricane Charley, please come participate in this informative and important public meeting.

For more information, please call the Emergency Management Office at 863/773-6373.

06:18

### PUBLIC NOTICE

The Office of Hardee County Emergency Management has scheduled a Local Mitigation Strategy (LMS) meeting on July 25, 2012, at 9:30 a.m., located at the Emergency Operations Center, 404 West Orange Street, Wauchula, FL 33873.

The purpose of a local mitigation strategy is to reduce the human, environmental, and economic costs of disasters. Mitigation is any action taken to permanently reduce or eliminate long-term risks to people and their property from the effects of disasters.

The goal of the LMS meeting will be to identify specific steps to be taken to reduce the impacts of various natural hazards, the timing of those steps, potential funding sources, their priority within the community, and the entities responsible for implementing each of them.

Please come participate in this informative and important public meeting.

For more information, please call the Emergency Management Office at 863/773-6373.

07:19

### PUBLIC NOTICE

The Office of Hardee County Emergency Management has scheduled a Local Mitigation Strategy (LMS) meeting on September 19, 2012, at 9:30 a.m., located at the Emergency Operations Center, 404 West Orange Street, Wauchula, FL 33873.

The purpose of a local mitigation strategy is to reduce the human, environmental, and economic costs of disasters. Mitigation is any action taken to permanently reduce or eliminate long-term risks to people and their property from the effects of disasters.

The goal of the LMS meeting will be to identify specific steps to be taken to reduce the impacts of various natural hazards, the timing of those steps, potential funding sources, their priority within the community, and the entities responsible for implementing each of them.

Please come participate in this informative and important public meeting.

For more information, please call the Emergency Management Office at 863/773-6373.

09:06

### PUBLIC NOTICE

The Office of Hardee County Emergency Management has scheduled a Local Mitigation Strategy (LMS) meeting on October 31, 2012, at 9:30 a.m., located at the Emergency Operations Center, 404 West Orange Street, Wauchula, FL 33873.

The purpose of a local mitigation strategy is to reduce the human, environmental, and economic costs of disasters. Mitigation is any action taken to permanently reduce or eliminate long-term risks to people and their property from the effects of disasters.

The goal of the LMS meeting will be to identify specific steps to be taken to reduce the impacts of various natural hazards, the timing of those steps, potential funding sources, their priority within the community, and the entities responsible for implementing each of them.

Please come participate in this informative and important public meeting.

For more information, please call the Emergency Management Office at 863/773-6373.

11:01

## PUBLIC NOTICE

The Office of Hardee County Emergency Management has scheduled a Local Mitigation Strategy (LMS) meeting on January 23, 2013, at 9:30 a.m., located at the Emergency Operations Center, 404 West Orange Street, Wauchula, FL 33873.

The purpose of a local mitigation strategy is to reduce the human, environmental, and economic costs of disasters. Mitigation is any action taken to permanently reduce or eliminate long-term risks to people and their property from the effects of disasters.

The goal of the LMS meeting will be to identify specific steps to be taken to reduce the impacts of various natural hazards, the timing of those steps, potential funding sources, their priority within the community, and the entities responsible for implementing each of them.

Please come participate in this informative and important public meeting.

For more information, please call the Emergency Management Office at 863/773-6373.

01:17

## PUBLIC NOTICE

The Office of Hardee County Emergency Management has scheduled a Local Mitigation Strategy (LMS) meeting on April 04, 2013, at 9:30 a.m., located at the Emergency Operations Center, 404 West Orange Street, Wauchula, FL 33873.

The purpose of a local mitigation strategy is to reduce the human, environmental, and economic costs of disasters. Mitigation is any action taken to permanently reduce or eliminate long-term risks to people and their property from the effects of disasters.

The goal of the LMS meeting will be to identify specific steps to be taken to reduce the impacts of various natural hazards, the timing of those steps, potential funding sources, their priority within the community, and the entities responsible for implementing each of them.

Please come participate in this informative and important public meeting.

For more information, please call the Emergency Management Office at 863/773-6373.

04:04

## PUBLIC NOTICE

The Office of Hardee County Emergency Management has scheduled a Local Mitigation Strategy (LMS) meeting on May 01, 2013, at 9:30 a.m., located at the Emergency Operations Center, 404 West Orange Street, Wauchula, FL 33873.

The purpose of a local mitigation strategy is to reduce the human, environmental, and economic costs of disasters. Mitigation is any action taken to permanently reduce or eliminate long-term risks to people and their property from the effects of disasters.

The goal of the LMS meeting will be to identify specific steps to be taken to reduce the impacts of various natural hazards, the timing of those steps, potential funding sources, their priority within the community, and the entities responsible for implementing each of them.

Please come participate in this informative and important public meeting.

For more information, please call the Emergency Management Office at 863/773-6373.

04:25

## PUBLIC NOTICE

The Office of Hardee County Emergency Management has scheduled a Local Mitigation Strategy (LMS) meeting on September 18, 2013, at 9:30 a.m., located at the Emergency Operations Center, 404 West Orange Street, Wauchula, FL 33873.

The purpose of a local mitigation strategy is to reduce the human, environmental, and economic costs of disasters. Mitigation is any action taken to permanently reduce or eliminate long-term risks to people and their property from the effects of disasters.

The goal of the LMS meeting will be to identify specific steps to be taken to reduce the impacts of various natural hazards, the timing of those steps, potential funding sources, their priority within the community, and the entities responsible for implementing each of them.

Please come participate in this informative and important public meeting.

For more information, please call the Emergency Management Office at 863/773-6373.

09:12

## PUBLIC NOTICE

The Office of Hardee County Emergency Management has scheduled a Local Mitigation Strategy (LMS) meeting on January 22, 2014, at 9:30 a.m., located at the Hardee County Health Department, Auditorium Room, 115 K.D. Revell Road, Wauchula, FL 33873.

The purpose of a local mitigation strategy is to reduce the human, environmental, and economic costs of disasters. Mitigation is any action taken to permanently reduce or eliminate long-term risks to people and their property from the effects of disasters.

The goal of the LMS meeting will be to identify specific steps to be taken to reduce the impacts of various natural hazards, the timing of those steps, potential funding sources, their priority within the community, and the entities responsible for implementing each of them.

Please come participate in this informative and important public meeting.

For more information, please call the Emergency Management Office at 863/773-6373.

01:16

## PUBLIC NOTICE

The Office of Hardee County Emergency Management has scheduled a Local Mitigation Strategy (LMS) meeting on May 07, 2014, at 9:30 a.m., located at the Hardee County Health Department, Auditorium Room, 115 K.D. Revell Road, Wauchula, FL 33873.

The purpose of a local mitigation strategy is to reduce the human, environmental, and economic costs of disasters. Mitigation is any action taken to permanently reduce or eliminate long-term risks to people and their property from the effects of disasters.

The goal of the LMS meeting will be to identify specific steps to be taken to reduce the impacts of various natural hazards, the timing of those steps, potential funding sources, their priority within the community, and the entities responsible for implementing each of them.

Please come participate in this informative and important public meeting.

For more information, please call the Emergency Management Office at 863/773-6373.

04:30

## PUBLIC NOTICE

The Office of Hardee County Emergency Management has scheduled a Local Mitigation Strategy (LMS) meeting on September 17, 2014, at 10:00 a.m., located at the Hardee Emergency Operations Center, 404 West Orange Street, Wauchula, FL 33873.
The purpose of a local mitigation strategy is to reduce the human, environmental, and economic costs of disasters. Mitigation is any action taken to permanently reduce or eliminate long-term risks to people and their property from the effects of disasters.

The goal of the LMS meeting will be to identify specific steps to be taken to reduce the impacts of various natural hazards, the timing of those steps, potential funding sources, their priority within the community, and the entities responsible for implementing each of them.

Please come participate in this informative and important public meeting.

For more information, please call the Emergency Management Office at 863/773-6373.

09:11

# Hardee County
# Multi-hazard
# Local Mitigation Strategy

★ City of Bowling Green ★ City of Wauchula ★
★ Town of Zolfo Springs ★ Hardee County ★

## Appendix

# 2015 Plan Update ~ Meeting Notices

*October 06, 2014* This meeting was held in the Emergency Operations Center. The meeting was publicized on the county website and a notice was posted at the Courthouse Annex. A notification was also sent via e-mail to the LMS working group members announcing the meeting. Copies of the e-mail, public notice, and sign-in sheet are provided below.

From: Amalia Arista Sent: Wed 10/1/2014 9:11 AM

To: ⊞ ***All Hardee County**; Amanda Gibson; Barbara Spears; Calvin Bates; Charlotte Kingdom; Darrel Davis; Dispatch; Hardee Chamber of Commerce; Jackie Johnson (Tax Collector); Jerry Conerly; Jim Griffin; Jim Hay; Joe Marble; John Eason; 'John Scheel'; Johnny Shivers; Julie Hermelbracht (DCF); Kathy Crawford (Property Appraiser); Larry Benavides (HCSO); Leslie Bond; Linda Roberson; Lora Mendoza; Mark Sellers; Nancy Dodd; Rob Krahl; Scott Gibson (Scottgibson@fdle.state.fl.us); Terry Atchley; Marie Wynn; Marty Altman; Mary Mann; Mike Thompson; Olivia Minshew; Patricia Wilson (Clerk Human Resources); PRECO dispatch; Rebecca McIntyre; Roberta johnson; Ruth Long (longr@nuhope.org); Sam Fite;

Cc:

Subject: Public Hearing ~ 2015 Local Mitigation Plan Update

Message LMS_Mtg_Notice_10.06.14_Plan.Update.pdf (13 KB)

The Hardee County Local Mitigation Strategy Workgroup is currently preparing its five-year update to the plan. All LMS meetings are open to the public, we encourage your attendance and participation as we prepare our plan update for review by the Florida Division of Emergency Management (FDEM) and the Federal Emergency Management Agency (FEMA). Any suggested strategies and improvements are welcome. If you are not able to attend, a member of your staff is welcome or you may submit written comments. If you would like a copy of the materials to be addressed at this LMS meeting, you may email me or reach me at the telephone number below.

We will meet on Monday, October 6, 2014, at 1:30 pm, at the Emergency Operations Center, 404 West Orange Street, Wauchula, FL 33873.

Thank you,
Amalia Arista
Program Manager
Hardee County Emergency Management
Division of Public Safety
404 West Orange Street
Wauchula, FL 33873
Phone: 863-773-6373
Fax: 863-773-9390
amalia.arista@hardeecounty.net
www.hardeecounty.net/eoc

*I can do all things through Christ who strengthens me.*
*Philippians 4:13*

**PUBLIC NOTICE**

**The Office of Hardee County Emergency Management has scheduled a Local Mitigation Strategy (LMS) meeting on October 6, 2014, at 1:30 p.m., located at the Emergency Operations Center, 404 West Orange Street, Wauchula, FL 33873.**

**The purpose of a local mitigation strategy is to reduce the human, environmental, and economic costs of disasters. Mitigation is any action taken to permanently reduce or eliminate long-term risks to people and their property from the effects of disasters.**

**The goal of the LMS meeting will be to identify specific steps to be taken to reduce the impacts of various natural hazards, the timing of those steps, potential funding sources, their priority within the community, and the entities responsible for implementing each of them.**

**For more information, please call the Emergency Management Office at 863/773-6373.**

**10:02**

# HARDEE COUNTY EOC

| | |
|---|---|
| **Re:** | ***LMS 2015 Plan Update*** |
| **Date:** | ***October 6, 2014*** |
| **Time:** | ***1:30 PM*** |
| **Location:** | ***EOC*** |

| Print Name | Email Address | Contact # | Agency |
|---|---|---|---|
| Amalia Arista | amalia.arista@hardeecounty.net | 863 773-6373 | HCEM |
| Richard A. Johnson | Johnson.richard2@mail.dc.state.fl.us | 863-767-4500 | FDOC |
| Glenn R Morris | Morris.Glenn@mail.dc.state.fl.us | 863-767-4500 | FDOC |
| Johnny Morales | Morales.Johnny@mail.dc.state.fl.us | 863-767-4500 | FDOC |
| Leann Rogers | rogers.leann@mail.doc.state.fl.us | 863 767 4500 | DOC |
| Marty Howell | Howell.marty@mail.dc.state.fl.us | 863-767-4500 | DOC |
| John Minny | Minny.John@mail.dc.state.fl.us | 863-767-4500 | DOC |
| Erin Hess | on file | on file | FL DOH Hardee |
| Sam Fite | on file | | FDB / City of BG |
| Barbara Spears | bspears@hardee.k12.fl.us | 863 735-2035 | HCSD |
| Andy Banjokian | andy@hcdifl.com | 863-781-7901 | HCDI |
| 'BJ' Haney | bj.haney@hardeecounty.net | 863 767 1964 | HC Plan/Development |
| JOE FILICE | JOE.FILICE@HARDEECOUNTY.NET | 863 767 5651 | ITS |
| JOHN SCHMIDT | john.schmidt@hardeecounty.net | 863-781-7034 | Building Dept. |
| LaDonna Perry | LaDonna.Perry@hardeeCoty | 863-368-2594 | Code Enforcement |
| Lisa Bolin | lisa.bolin@hardeecounty.net | 863-773-3236 | building dept |
| Susan Chesser | susan.chesser@hardeecounty.net | 863-773-3236 | Code Enforcement |
| Shelly Massey | shelly.massey@hardeeCounty.net | 863-773-6349 | OCD |
| Lorie Ayers | lorie.ayers@hardeecounty.net | 863 773 6349 | Community Development |

# HARDEE COUNTY EOC

| | |
|---|---|
| Re: | *LMS 2015 Plan Update* |
| Date: | *October 6, 2014* |
| Time: | *1:30 PM* |
| Location: | *EOC* |

| Print Name | Email Address | Contact # | Agency |
|---|---|---|---|
| Diane Moore | diane.moore@hardeecounty.ne | 863-773-6349 | OCD |
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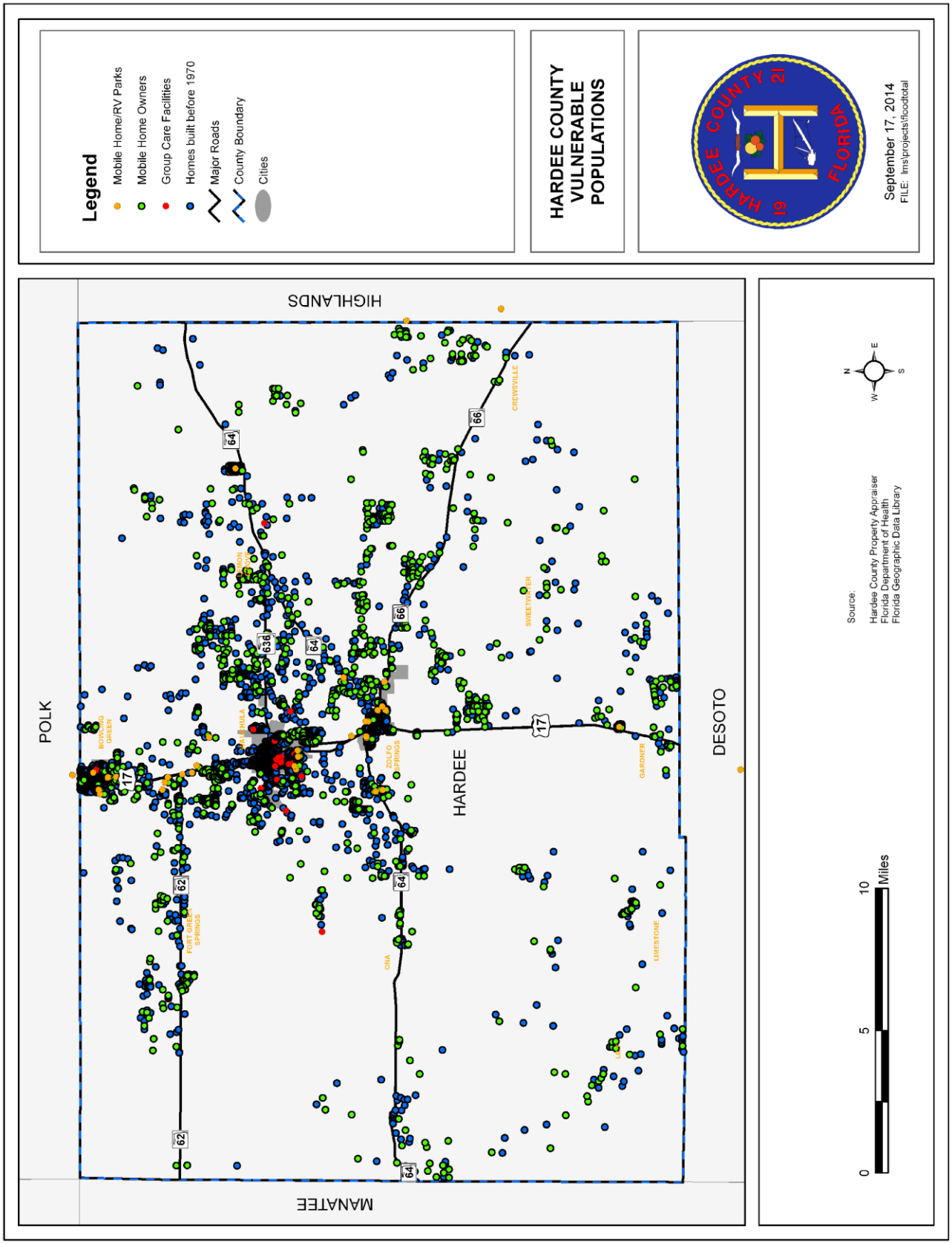
# Working Group Members

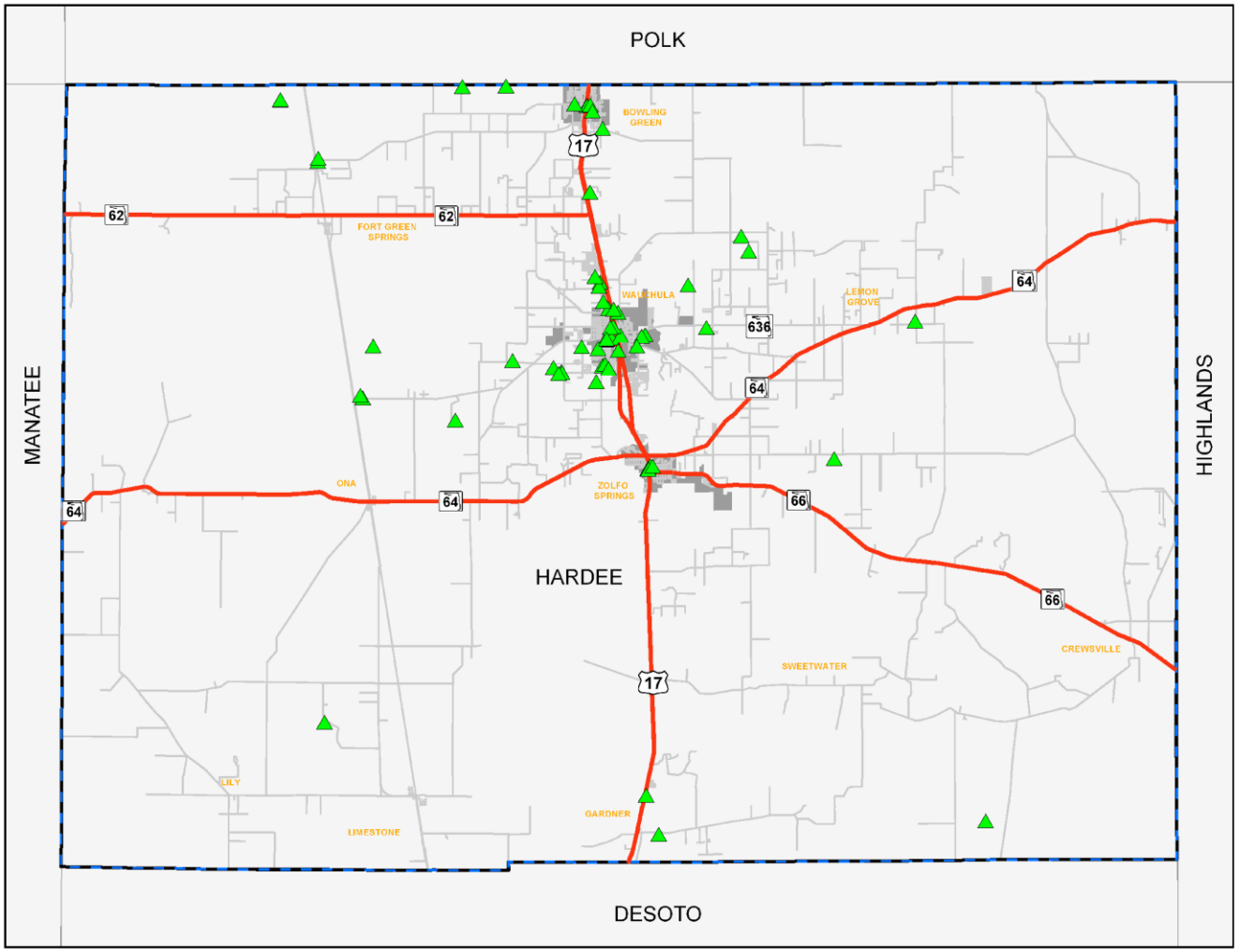
| Working Group Members | |
|---|---|
| **Chairperson** | |
| Amalia Arista | Program Manager, Hardee County Emergency Management |
| Phone | (863) 773-6373 |
| E-mail | amalia.arista@hardeecounty.net |
| Address | 404 West Orange St |
| | Wauchula, FL 33873 |
| **Vice Chairperson** | |
| Connie Jones | Citizen |
| Phone | 863-245-1194 |
| E-mail | cmjcreech@yahoo.com |
| Address | 1550 Colson Road |
| | Wauchula, FL 33873 |

# Local and Regional Mitigation Partners

| Local and Regional Mitigation Partners |
|---|
| American Red Cross, Disaster Program Manager-Bene Hunter |
| Central Florida Regional Planning Council, Program Manager-Chuck Carter |
| DeSoto County Emergency Management, Director-Doug Christ |
| Florida Department of Transportation, District 1, Supervisor-Kevin Salsbury |
| Florida Division of Emergency Management, Mitigation Planner-Michael Wallick |
| Florida Forest Service, Mitigation Specialist-Patrick Mahoney |
| Florida Hospital Wauchula Division, Director of Nursing-Jerilyn Stamps |
| Florida Institute of Neurologic Rehabilitation, Administrator-Travis Bone |
| Hardee Correctional Institute, Major-Johnny Morales |
| Hardee County Chamber of Commerce, Executive Director-Position Vacant |
| Hardee County Economic Development, Director-Bill Lambert |
| Hardee County Health Department, Administrator-Erin Hess |
| Hardee County School Board, Fire Safety Inspector-Barbara Spears |
| Helena Chemical Company, Plant Manager |
| Hendry County Emergency Management, Director-Lupe Taylor |
| Highlands County Emergency Management, Director-Scott Canady |
| IFAS Extension, Director-Carolyn Wyatt |
| Manatee County Emergency Management, Director-Don Hermey |
| Mosaic, Community Relations Manager-Diana Youmans |
| Peace River Electric Cooperative, Supervisor-Mark Sellers |
| Polk County Emergency Management, Director-Pete McNally |
| ProSource One – Plant Manager |
| Range Cattle Station - Administration |
| South Florida State College, Director-Teresa Crawford |
| Southwest Florida Water Management District, Region Supervisor-Daniel Kushmer |
| UAP – Plant Manager |
| Vandolah Power, Plant Manager-Steven Pourde |
| City of Wauchula, Assistant City Manager-Olivia Minshew (or Designee) |
| City of Bowling Green, City Manager-Jerry Conerly (or Designee) |
| Town of Zolfo Springs, Town Manager-Linda Roberson (or Designee) |
| Hardee County, EM Program Manager-Amalia Arista |
| Hardee County Public Works, Director-Ken Wheeler |
| Hardee County Public Works, Project Coordinator-Christopher Simpron |


Legend
Mobile Home/RV Parks
Mobile Home Owners
Group Care Facilities
Homes built before 1970
Major Roads
County Boundary
Cities
HARDEE COUNTY VULNERABLE POPULATIONS
HARDEE COUNTY FLORIDA
September 17, 2014
FILE: lms\projects\floodtotal
POLK
HIGHLANDS
MANATEE
DESOTO
HARDEE
BOWLING GREEN
WAUCHULA
ZOLFO SPRINGS
FORT MEADE
SPRINGS
OMA
GARDNER
LIMESTONE
CREWSVILLE
SWEETWATER
17
62
64
66
636
0
5
10
Miles
N
W
E
S
Source:
Hardee County Property Appraiser
Florida Department of Health
Florida Geographic Data Library

| Critical Facilities List | | |
|---|---|---|
| **Facility** | **Critical Function** | **Location** |
| **Hardee County** | | |
| Hardee Power Station Units 1 & 2 | Power Generation | 6695 CR 663 |
| Peace River Electric Cooperative | Power Transmission | 210 Metheny Rd. |
| SECI Generating Station | Power Generation | 6697 N. CR 663 |
| Hardee Co. Water Plant/WWT Plant | Potable Water/WWT | SR 62 |
| Hardee Co. Wastewater Treatment Plant | Wastewater Treatment | Maurice Sonny Clavel Rd. |
| Wauchula Municipal Airport | Alternate POD Site | 1302 Maurice Sonny Clavel Rd. |
| Hardee Co. Landfill | Debris Staging Area | 685 Airport Rd. |
| Hardee Co. Sheriff's Office | Emergency Response | 900 E. Summit St. |
| Florida Institute of Neurological Rehab. | Healthcare/Life Support | 1963 Vandolah Rd. |
| South Florida State College | Special Needs Shelter | 2968 US 17 N |
| Vandolah Power | Power Generation | 2394 Vandolah Rd. |
| Hilltop Elementary (K-8) School | General Population Shelter | 2401 US 17 N. |
| Hardee County Agri-Civic Center | Post-Disaster Recov. Shelter | 515 Civic Center Dr. |
| Communications Towers | Communication | Various |
| WAUC Radio Station | Communication | 1310 S. Florida Ave. |
| WZZS/WZTA Radio Stations | Communication | 7891 S. US 17 |
| **City of Wauchula** | | |
| COW City Hall/Wauchula PD | Gov Admin/Emerg Response | 126 S. 7th Ave. |
| COW Wastewater Treatment Plant | Wastewater Treatment | 155 Griffin Rd. |
| COW Water Plant | Potable Water | 820 E. Main St. |
| Hardee Co. Emerg. Operations Center | Emergency Operations | 404 W. Orange St. |
| Hardee Co. Fire Rescue Station 1 | Emergency Response | 149 K.D. Revell Rd. |
| Hardee Co. Fuel Depot/Barn | Fuel Provision | 205 Hanchey Rd. |
| Hardee Co. Health Department | Public Health | 115 K.D. Revell Rd. |
| Hardee Co. Administration | Employees' Families Shelter | 412 W. Orange St. |
| Hardee Co. Courthouse | Courthouse/Public Records | 417 W. Orange St. |
| Hardee Co. School Board Offices | Administration | 1009 N. 6th Ave. |
| Florida Hospital Wauchula | Healthcare/Life Support | 533 W. Carlton St. |
| Hardee Manor | Alt. Special Needs Shelter | 401 Orange Place |
| HCSB Media Center | Alternate EOC | 200 S. Florida Ave. |
| Wauchula Farmers Mkt | Post-Disaster Recov. Shelter | 535 S. 6th Ave. |
| North Wauchula Elementary School | General Population Shelter | 1120 N. Florida Ave. |
| Old Hardee Junior High Main Bldg./Gym | Pet-Friendly Shelter | 300 S. Florida Ave. |
| Curtis Ezelle Building | Public Records/Elections | 110 W. Oak St. |
| **City of Bowling Green** | | |
| COBG City Hall/BGPD | Gov Admin/Emerg Response | 104 E. Main St. |
| COBG Wastewater Treatment Plant | Wastewater Treatment | 596 Lake Branch Rd. |
| COBG Water Plant | Potable Water | 501 Jones St. |
| Hardee Co. Fire Rescue Station 3 | Emergency Response | 620 W. Main St. |
| Bowling Green Elementary School | General Population Shelter | 4530 Church Ave. |
| **Town of Zolfo Springs** | | |
| TOZS City Hall | Government Administration | 3210 S. US 17 |
| TOZS Wastewater Treatment Plant | Wastewater Treatment | 1120 SR 66 |
| TOZS Water Plant | Potable Water | 215 4th Ave. |
| Hardee Co. Fire Rescue #2/Zolfo HCSOPD | Emergency Response | 104 Fifth St. W. |
| Zolfo Springs Elementary School | General Population Shelter | 3215 Schoolhouse Rd. |




**64 Total Critical Facilities**

0 5 10 Miles

Source:
Hardee County Emergency Management

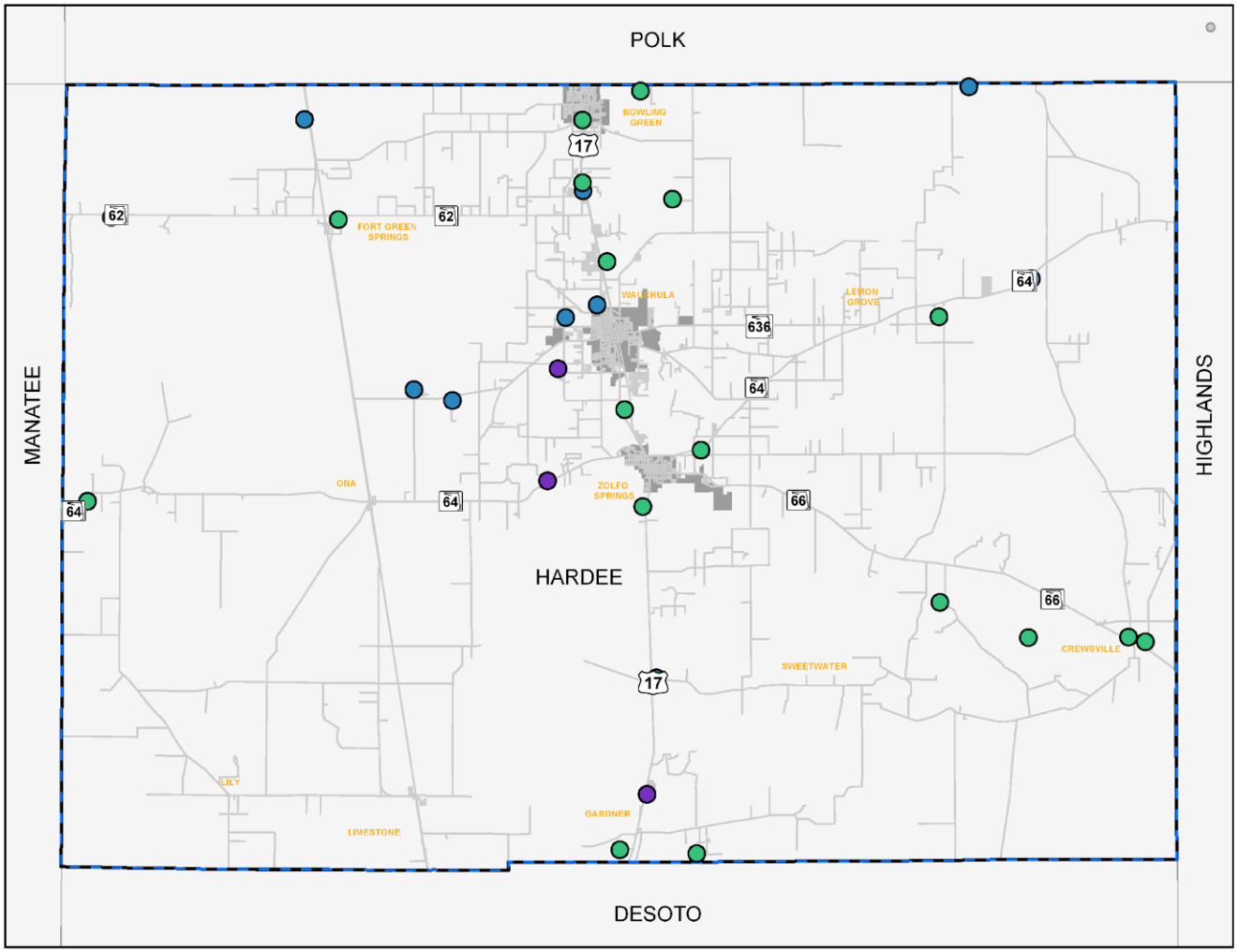
N W E S

## Legend

- Critical Facilities
- Roads
- County Boundary
- Evacuation Routes
- Cities

## HARDEE COUNTY CRITICAL FACILITIES

September 17, 2014
FILE: lms\projects\floodtotal




**30 Total Towers**

0 5 10 Miles

Source:
Florida Geograhic Data Library

N W E S

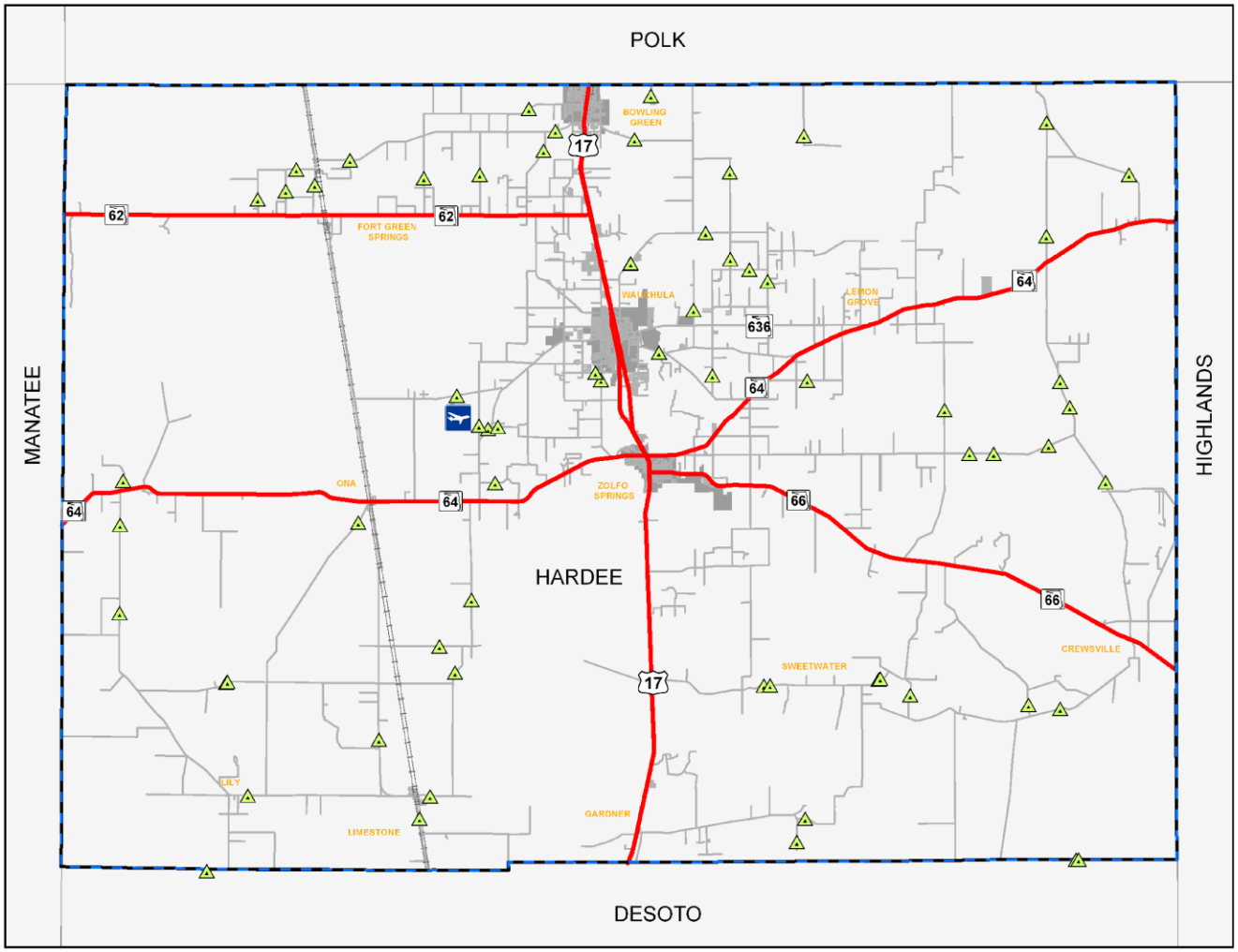
## Legend

**Communication Towers**

- Cell Towers
- FM Towers
- Wireless Towers
- County Boundary
- Roads
- Cities

**HARDEE COUNTY COMMUNICATION SYSTEMS**

September 17, 2014
FILE: lms\projects\floodtotal




## Legend

- County Bridge
- Public Airport
- County Boundary
- Evacuation Routes
- Roads
- CSX Railroad
- Cities

**HARDEE COUNTY TRANSPORTATION SYSTEMS**

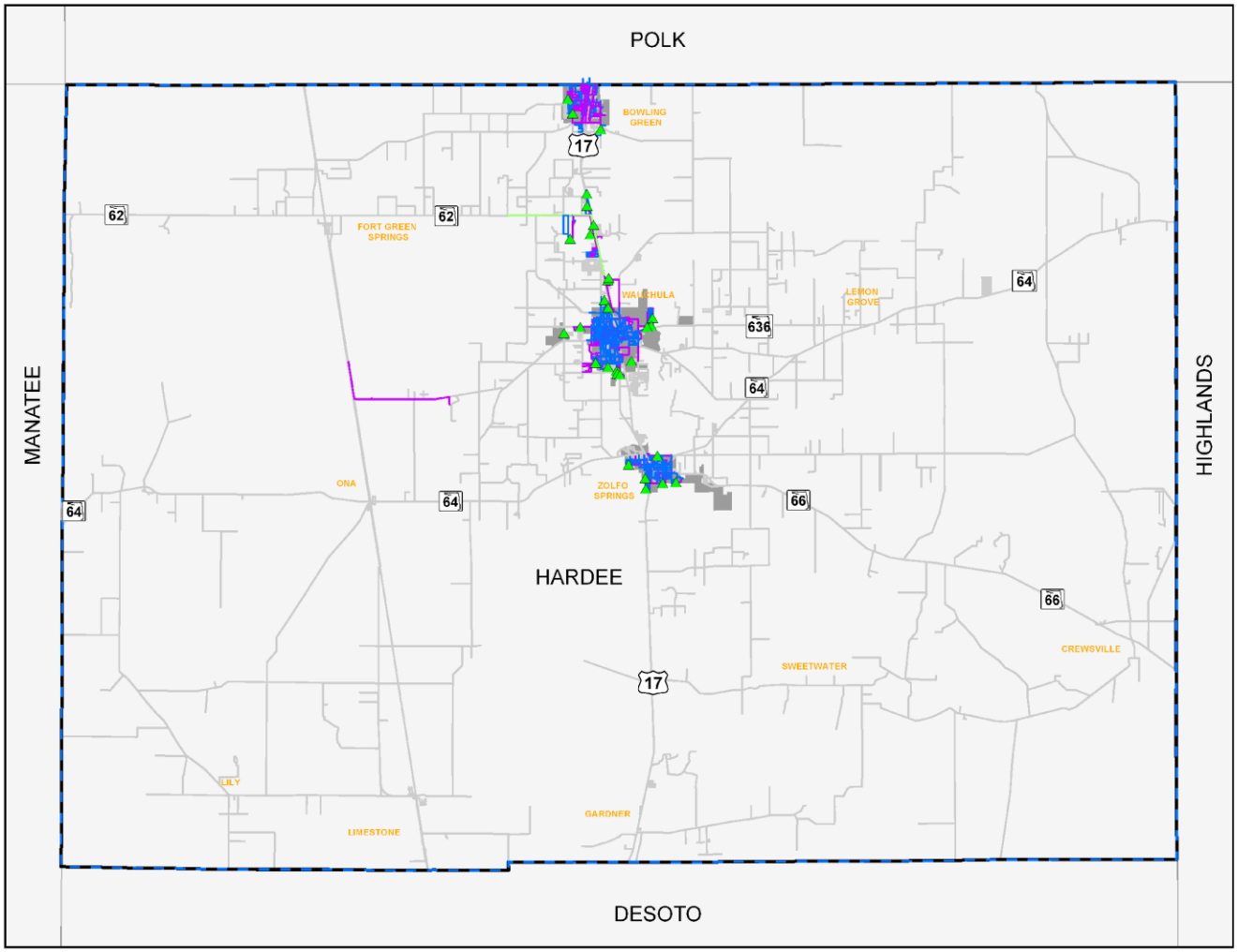
September 17, 2014
FILE: lms\projects\floodtotal

0 5 10 Miles

Source:

Hardee County Emergency Management
Hardee County Road & Bridge
Florida Geographic Data Library

N W E S




0 5 10 Miles

Source:

Hardee County Utilities
City of Bowling Green Utilities
City of Wauchula Utilities
Town of Zolfo Springs Utilities

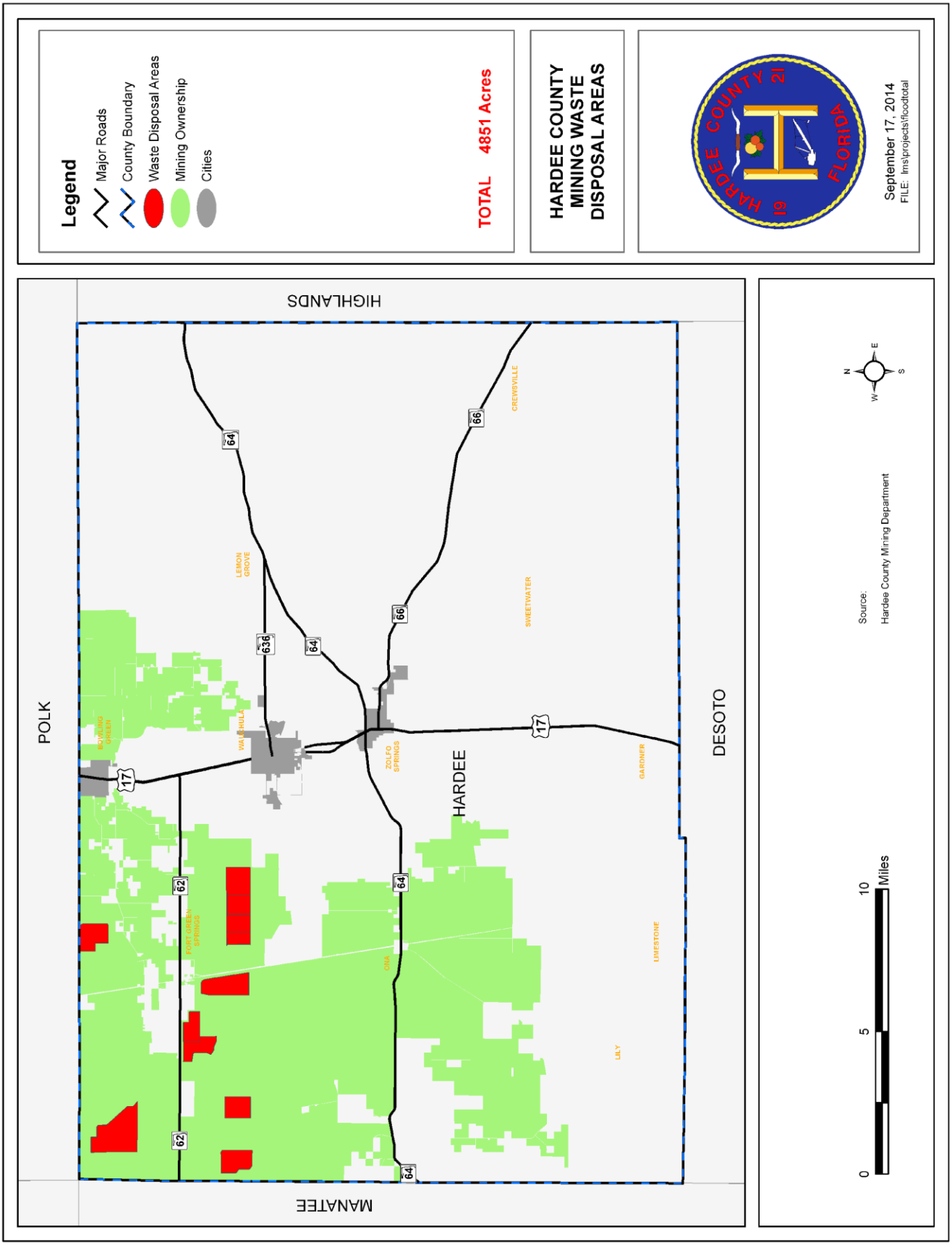
N W E S

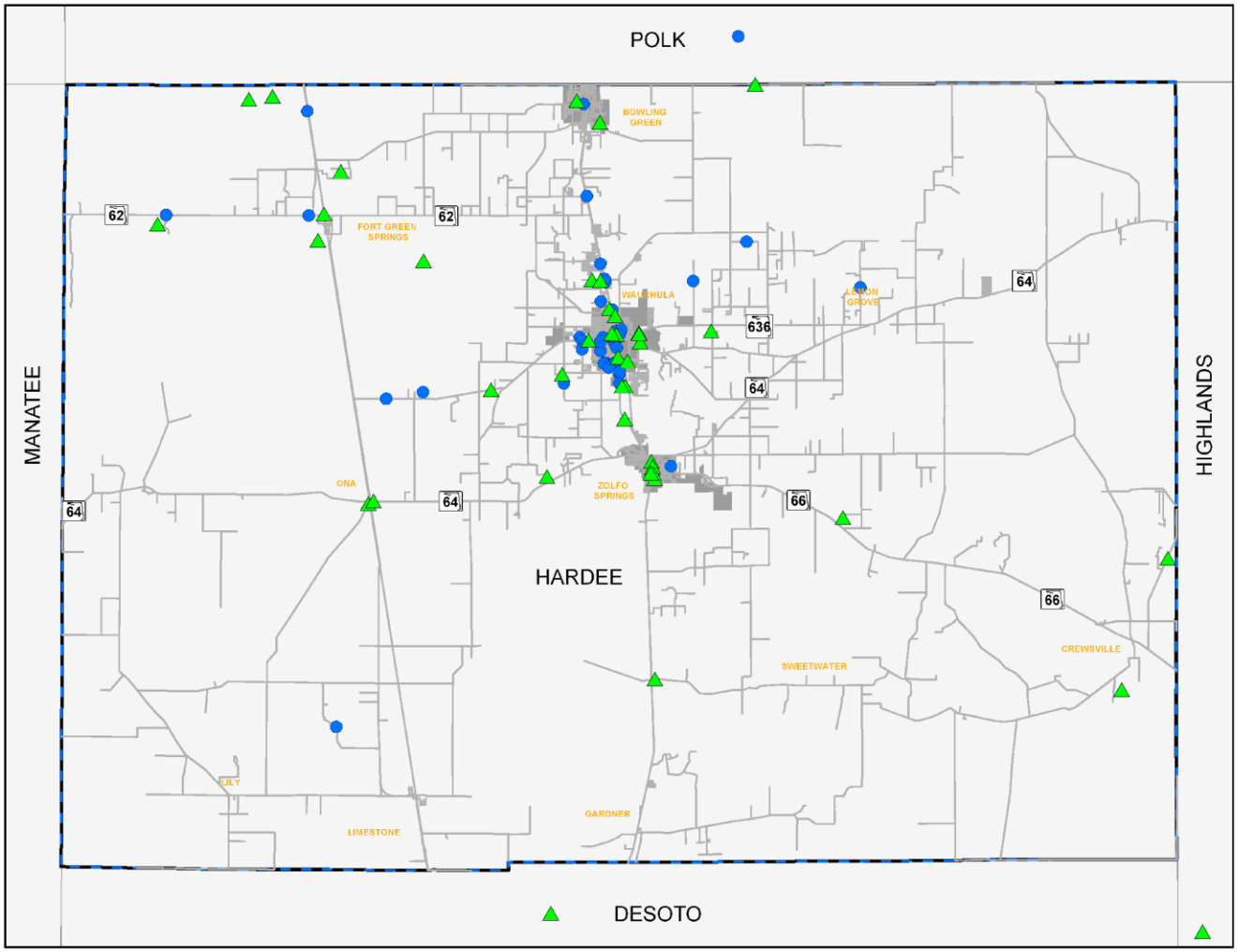
## Legend

- Lift Stations
- Reuse Lines
- Waste Lines
- Water Lines
- County Boundary
- Roads
- Cities

**HARDEE COUNTY UTILITY SYSTEMS**

September 17, 2014
FILE: lms\projects\floodtotal


Legend
Major Roads
County Boundary
Waste Disposal Areas
Mining Ownership
Cities
TOTAL 4851 Acres
HARDEE COUNTY
MINING WASTE
DISPOSAL AREAS
HARDEE COUNTY 21
19 FLORIDA
September 17, 2014
FILE: lms\projects\floodtotal
POLK
HIGHLANDS
MANATEE
DESOTO
HARDEE
EDWARD GREEN
WAUCHULA
LEMON GROVE
FORT GREEN SPRINGS
ZOLFO SPRINGS
ONA
CREWSVILLE
SWEETWATER
GARDNER
LIMESTONE
LILY
17
62
64
636
66
Source:
Hardee County Mining Department
N
E
S
W
0
5
10
Miles




0 5 10 Miles

Source:

Hardee County Emergency Management
Florida Geographic Data Library

N
W E
S

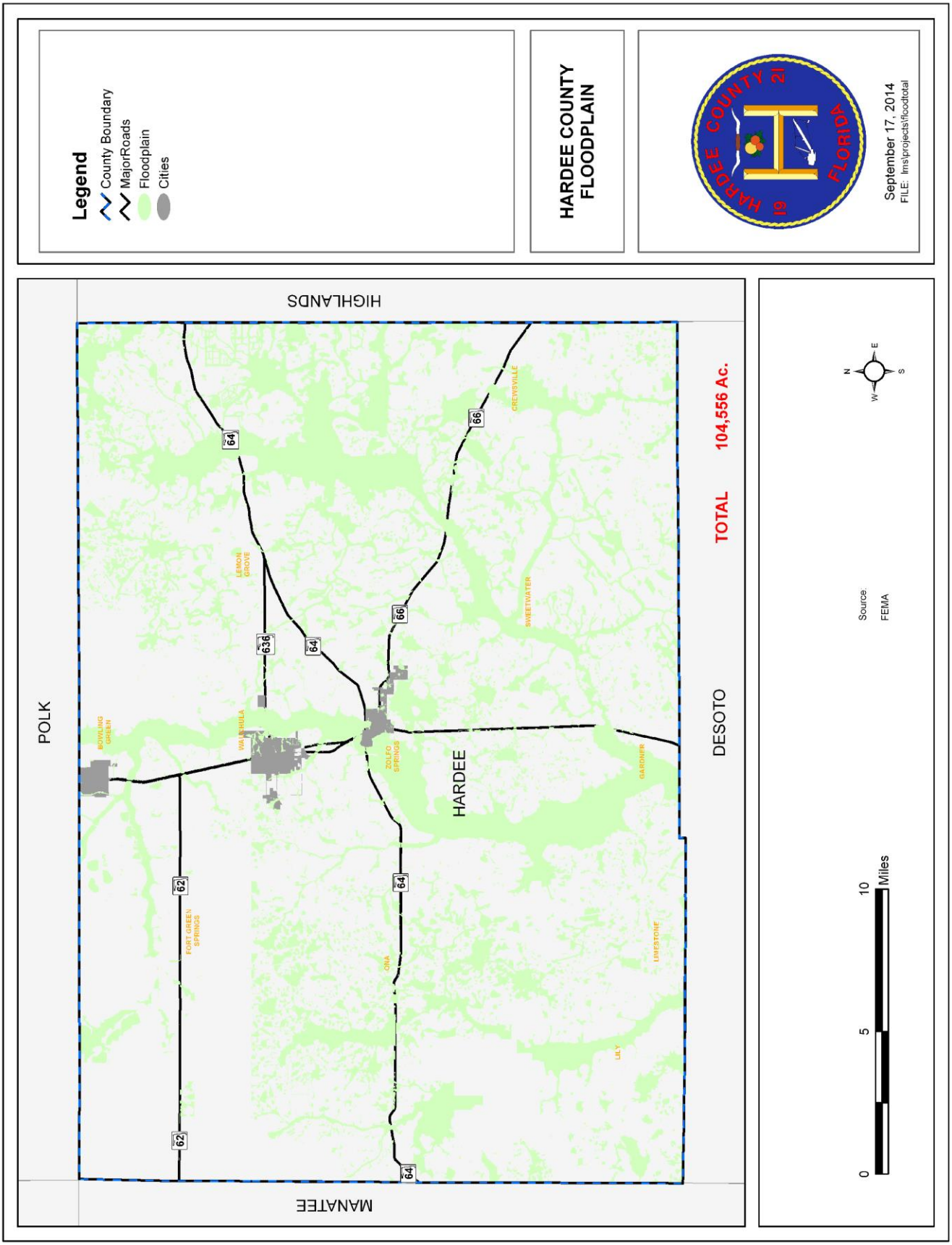
## Legend

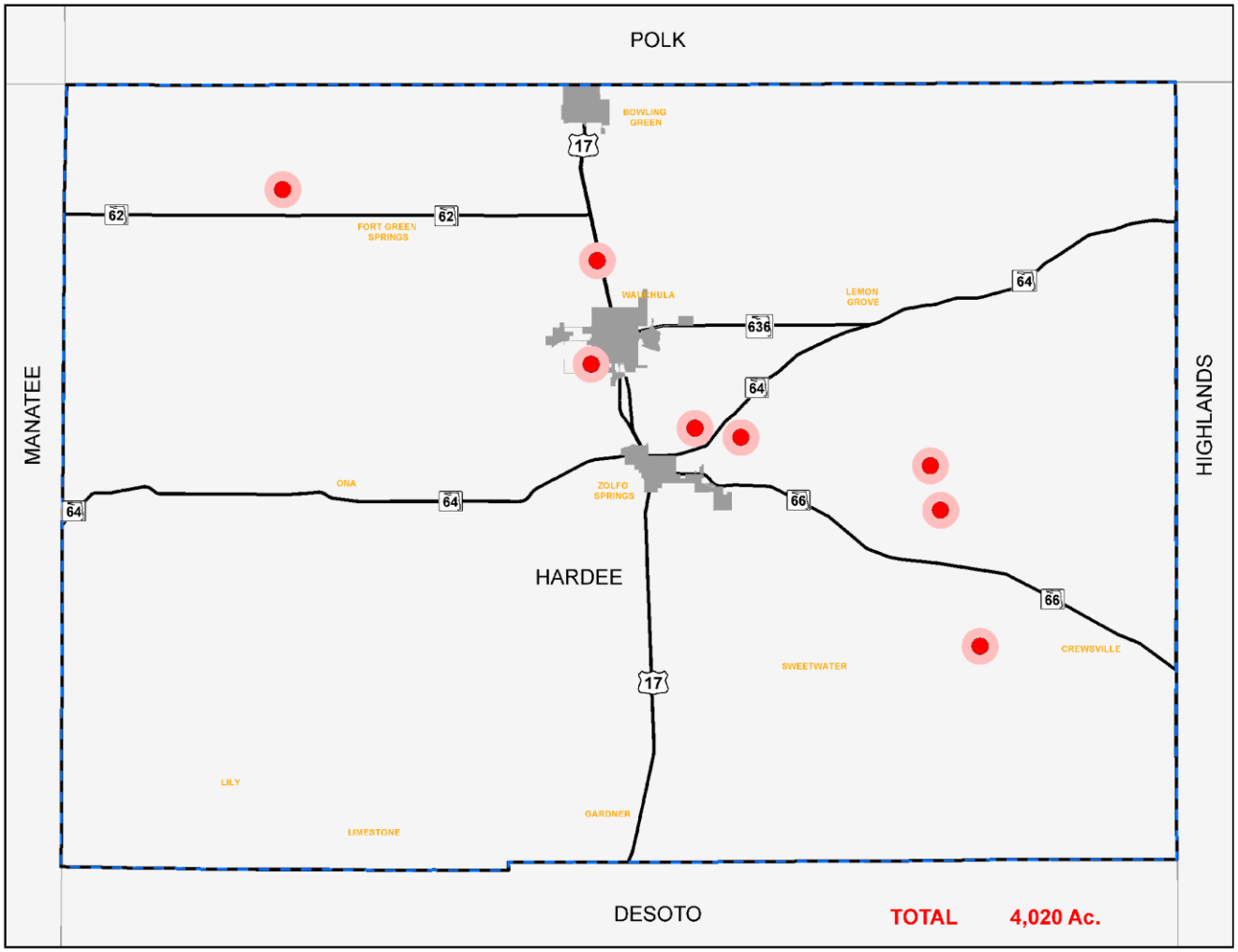
- Hazardous Materials Sites
- BioMedical Waste
- Roads
- County Boundary
- Cities

**TOTAL 88 Sites**

**HARDEE COUNTY HAZARDOUS MATERIALS SITES**

September 17, 2014
FILE: lms\projects\floodtotal


Legend
County Boundary
MajorRoads
Floodplain
Cities
HARDEE COUNTY FLOODPLAIN
HARDEE COUNTY 21 19 FLORIDA
September 17, 2014
FILE: lms\projects\floodtotal
POLK
HIGHLANDS
MANATEE
DESOTO
HARDEE
BOWLING GREEN
WAUCHULA
LEMON GROVE
ZOLFO SPRINGS
FORT GREEN SPRINGS
ONA
LILY
LIMESTONE
GARDNER
SWEETWATER
CREWSVILLE
62
64
636
66
TOTAL 104,556 Ac.
Source:
FEMA
N
E
S
W
0
5
10
Miles




0 5 10 Miles

Source:
Florida Geological Survey

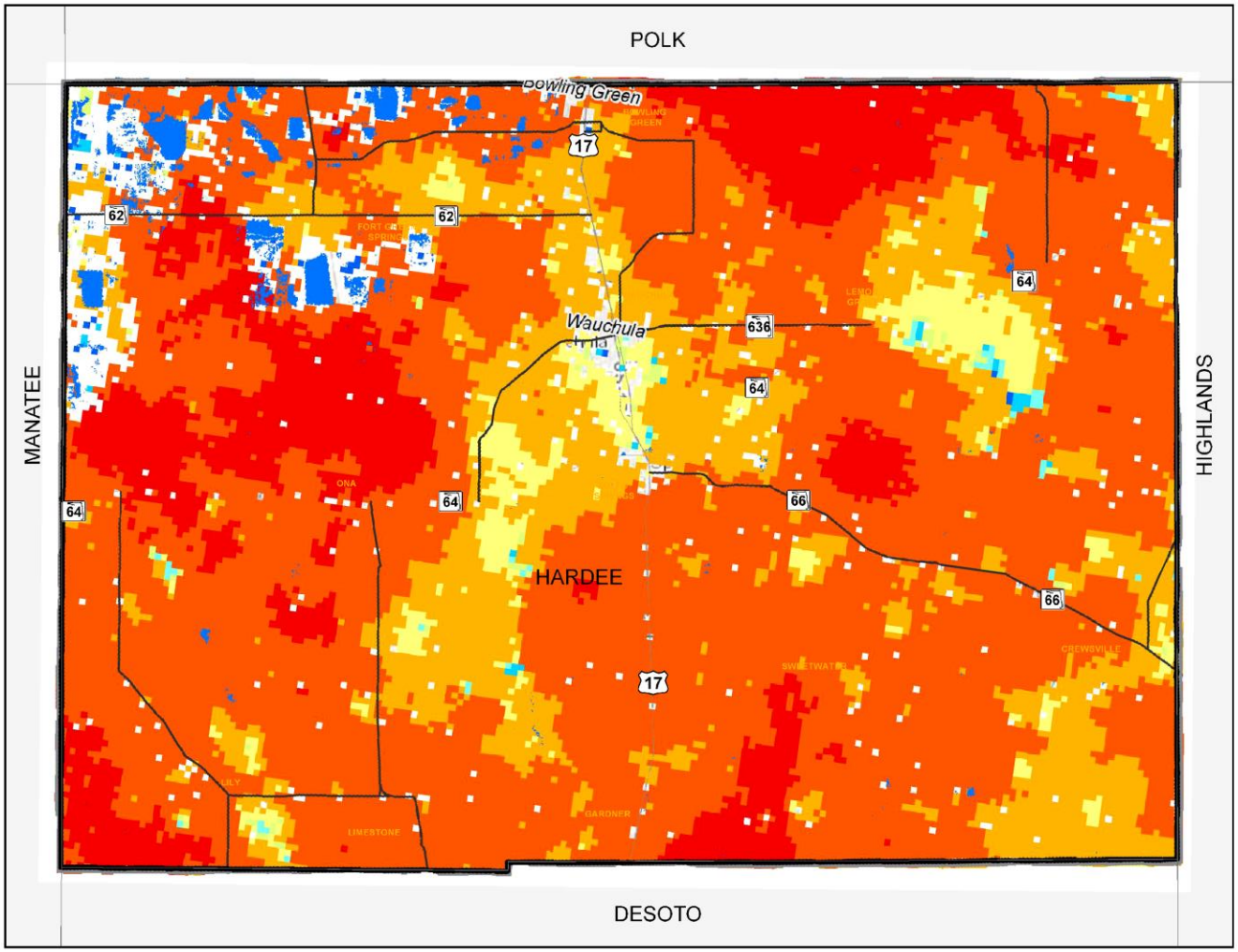
N W E S

## Legend

- Sinkholes
- County Boundary
- Sinkhole Buffer - 0.5 mile
- Major Roads
- Cities

**HARDEE COUNTY SINKHOLE BUFFER**

September 17, 2014
FILE: h:\hardee\arcm\em\lms\karsttotal




**Legend**

- County Boundary
- Major Roads
- Cities

**Burn Probability**

- 1 (Lowest Probability)
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10 (Highest Probability)

**HARDEE COUNTY FIRE POTENTIAL**

**367,146 Total Acres**
**High Burn Probability**

0 5 10 Miles

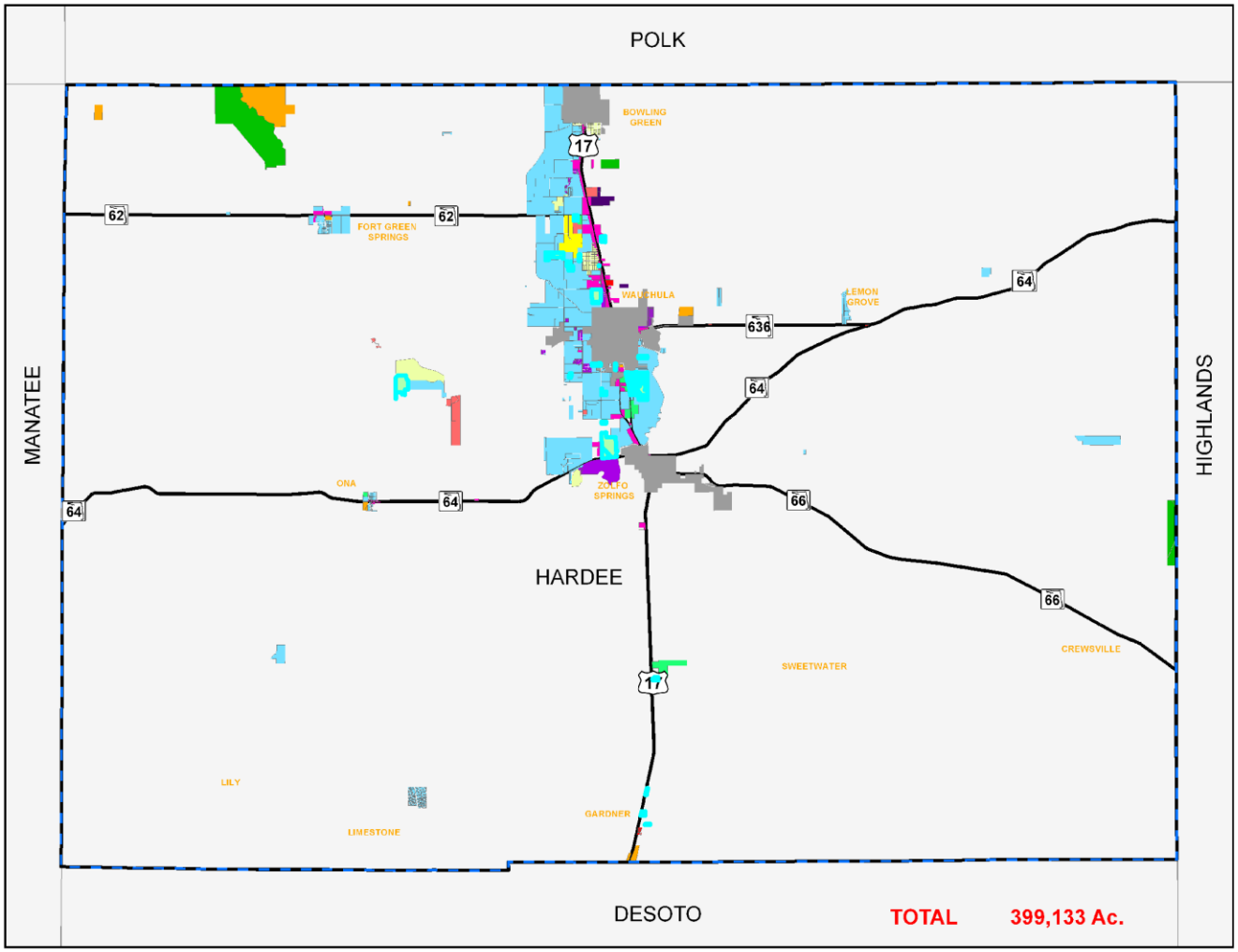
Source:

Florida Forest Service
Rsik Summary Report 2014

N W E S

HARDEE COUNTY 19 21 FLORIDA

September 17, 2014
FILE: lms\projects\floodtotal




0 5 10 Miles

Source:
Hardee County Planning

N
W E
S

## Legend

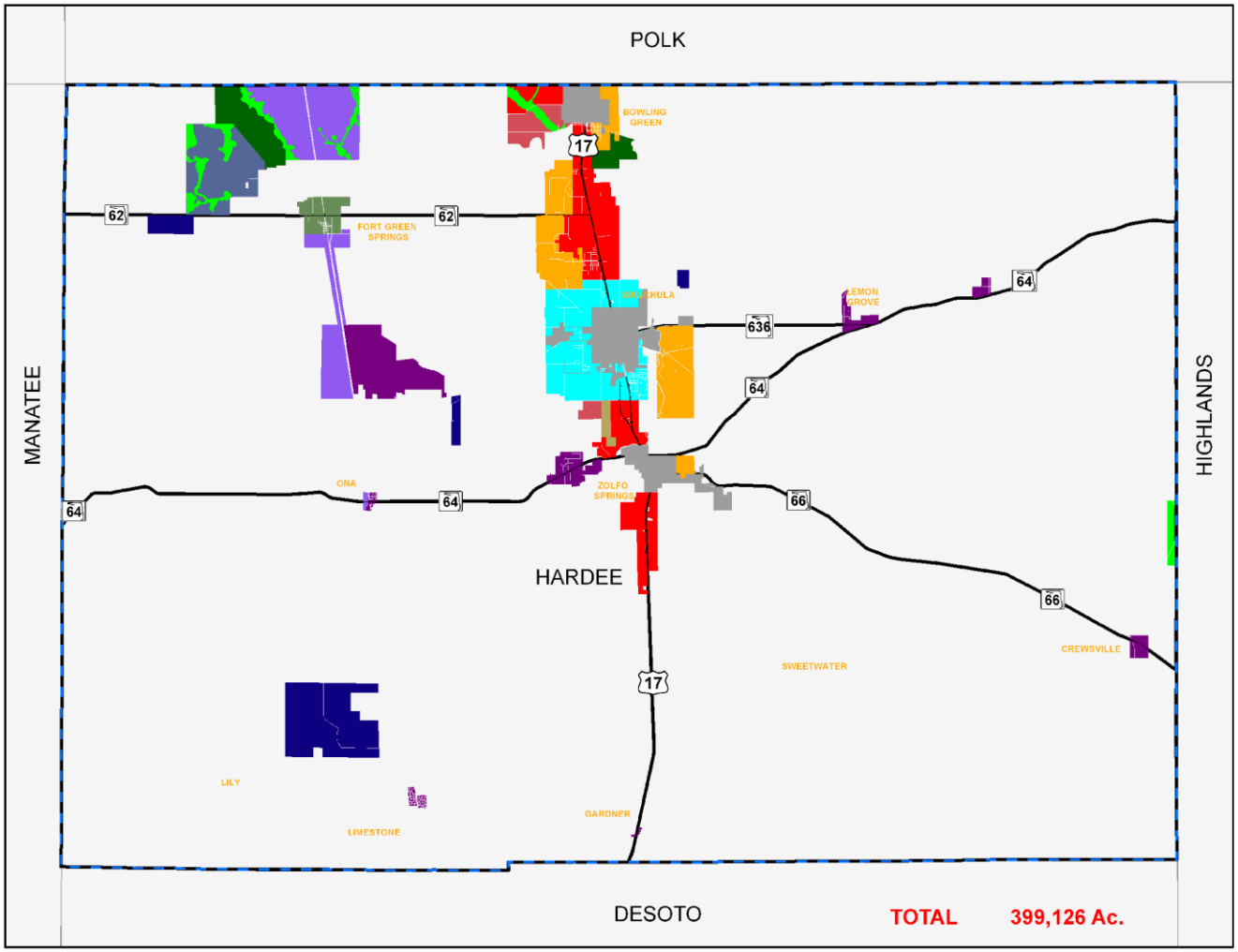
- County Boundary
- Major Roads

| | |
|---|---|
| A-1 | 384,618 Ac. |
| C-1 | 34 Ac. |
| C-2 | 727 Ac. |
| C/IBC | 255 Ac. |
| F-R | 8,486 Ac. |
| I-1 | 908 Ac. |
| I-2 | 274 Ac. |
| P-I | 333 Ac. |
| P-R | 1,606 Ac. |
| PUD | 119 Ac. |
| R-1 | 497 Ac. |
| R-2 | 636 Ac. |
| R-3 | 640 Ac. |
| Cities | |

**HARDEE COUNTY ZONING**

HARDEE COUNTY 19 21 FLORIDA

September 17, 2014
FILE: lms\projects\floodtotal




## Legend

| | |
|---|---|
| County Boundary | |
| Major Roads | |
| Agriculture | 368,748 Ac. |
| Commerce Park | 660 Ac. |
| Conservation | 1644 Ac. |
| Highway Mixed Use | 4,665 Ac. |
| Industrial | 4,301 Ac. |
| Public Institutional | 3,583 Ac. |
| Recreation | 1,705 Ac. |
| Residential High | 202 Ac. |
| Residential Low | 848 Ac. |
| Residential Mixed Use | 3,957 Ac. |
| Rural Center | 3,274 Ac. |
| Rural Village | 2,095 Ac. |
| Town Center | 3,444 Ac. |
| Cities | |

**HARDEE COUNTY FUTURE LAND USE**

0 5 10 Miles

Source:
Hardee County Planning

N W E S

September 17, 2014
FILE: lms\projects\floodtotal

# Prioritization Scoring for Mitigation Projects and Programs

| Evaluation of Mitigation Projects and Programs | | | | | | |
|---|---|---|---|---|---|---|
| **Project Description** | **S** | **A** | **F** | **E** | **T** | **Total** |
| | **Societal** | **Administrative** | **Financial** | **Environmental** | **Technical** | |
| Drainage Project on Mason Dixon Ave | 2 | 2 | 2 | 2 | 3 | 11 |
| Drainage Improvements near Citrus Valley MHP | 2 | 3 | 2 | 2 | 3 | 12 |
| SR 64 Elevation or Culvert Upgrade in 3 locations | 3 | 1 | 1 | 2 | 2 | 9 |
| Ditch Clearing and Culvert Cleaning | 3 | 3 | 3 | 2 | 2 | 13 |
| Tree-Trimming and Limb Removal | 2 | 3 | 3 | 2 | 3 | 13 |
| Lightning Awareness Bulletins | 3 | 3 | 3 | 3 | 2 | 14 |
| Installation of Lightning Arrestor at Historic City Hall | 2 | 2 | 3 | 3 | 3 | 13 |
| Fire Station #1 Wind Retrofit | 3 | 2 | 3 | 3 | 3 | 14 |
| Wauchula Public Works Wind Retrofit (Green St Building) | 2 | 2 | 3 | 3 | 3 | 13 |
| Bowling Green Public Works Wind Retrofit | 2 | 2 | 3 | 3 | 3 | 13 |
| Zolfo Springs Public Works Wind Retrofit | 2 | 2 | 3 | 3 | 3 | 13 |
| New Homeowner Sinkhole Information Distribution | 3 | 3 | 3 | 3 | 2 | 14 |
| New Homeowner Wildfire Protection Info Distribution | 3 | 3 | 3 | 3 | 2 | 14 |
| Extreme Temperature Public Safety Messages | 3 | 3 | 3 | 3 | 2 | 14 |
| Code Enforcement of Local Water Restrictions | 2 | 2 | 2 | 3 | 2 | 11 |

| Evaluation of Mitigation Projects and Programs | | | | | | |
|---|---|---|---|---|---|---|
| **Project Description** | **S** | **A** | **F** | **E** | **T** | **Total** |
| | **Societal** | **Administrative** | **Financial** | **Environmental** | **Technical** | |
| Public Service Announcements of Water-Saving Tips | 3 | 3 | 3 | 3 | 2 | 14 |
| Distribute Early Warning System Devices | 2 | 3 | 3 | 3 | 2 | 13 |
| Distribute All-Hazard Radios | 2 | 3 | 3 | 3 | 2 | 13 |
| Construct/identify Safe Rooms in Group Homes and ALFs | 2 | 2 | 3 | 3 | 3 | 13 |
| Develop Emergency Action Plans for Public Buildings | 3 | 2 | 3 | 3 | 2 | 13 |
| Enforce Fire Prevention Ordinance | 2 | 2 | 3 | 3 | 2 | 12 |
| Develop Secondary Egress for Golfview Estates Subdivision | 1 | 2 | 3 | 2 | 3 | 11 |
| Develop Secondary Egress for Riverview Heights Subdivision | 1 | 2 | 3 | 2 | 3 | 11 |
| Develop Secondary Egress for FINR | 1 | 2 | 3 | 2 | 3 | 11 |
| Utilize Grant Funding for Post-Disaster Code Enforcement | 1 | 3 | 3 | 3 | 2 | 12 |
| Revise Floodplain Ordinance After FIRM Map Update | 2 | 3 | 3 | 3 | 2 | 13 |
| Elevate Lift Station on SR 64 | 2 | 2 | 2 | 3 | 3 | 12 |
| EOC Retrofit and Enhancements | 1 | 3 | 2 | 3 | 2 | 11 |
| Harden fueling station at county barn | 2 | 3 | 2 | 3 | 2 | 12 |
| Harden fueling station at bus garage | 2 | 3 | 2 | 3 | 2 | 12 |
| Harden and generate fueling station in COW | 2 | 3 | 2 | 3 | 2 | 12 |
| Incorporate mitigation into other planning mechanisms | 2 | 3 | 3 | 3 | 2 | 13 |
| City of Wauchula / Ditch Project that runs East & West from 1st Street over to Griffin on the Northside of Green Street | 3 | 1 | 2 | 2 | 2 | 10 |

# Current/Deferred Mitigation Projects

| Mitigation Projects and Programs | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Priority Rank | Project or Program | Mitigation Goal(s) Addressed | Hazard Mitigated | Addresses New or Existing | Responsible Agency | Estimated Cost | Possible Funding Source(s) | Length of Time to Complete | Status as of Oct. 2014 |
| High | Lightning Awareness Bulletins | 1,5 | Lightning | n/a | Hardee County Emergency Management | $500 | Local | Ongoing | New |
| High | New Homeowner Wildfire Protection Info Distribution | 1,5 | Wildfire | n/a | All Jurisdictions | $500 | Local | Ongoing | New |
| High | Extreme Temperature Public Safety Messages | 1,5 | Extreme Heat, Freeze | n/a | Hardee County EM | $500 | Local | Ongoing | New |
| High | Public Service Announce-ments of Water-Saving Tips | 1,5 | Drought | n/a | Hardee County EM, HCPW | $500 | Local | Ongoing | New |
| Med | Clean discharge/outfall ditches on private lands for drainage from public road rights-of-way | 1 | Flood | Both | Hardee County Public Works | $20,000 | Local | Ongoing | New |
| Med | Tree-Trimming and Limb Removal for Local /Private; Utility Easements | 1 | Wind | Both | COW Utilities and Utility Co. | - | Local/Private | Ongoing | New |
| Med | Wauchula Public Works Administrative Modular Office Wind Retrofit | 1,3 | Wind | Existing | COW Planning | $ 75,000 | HMGP/Local | 30 days | New |
| Med | Bowling Green Public Works Wind Retrofit | 1,3 | Wind | Existing | City of BG Admin. | $10,000 | HMGP | 30 days | New |
| Med | Zolfo Springs Public Works Wind Retrofit | 1,3 | Wind | Existing | Town of ZS Admin. | $10,000 | HMGP | 30 days | New |
| Med | Distribute All-Hazard Radios | 1,5 | All | Both | Hardee County EM | n/a | Local | n/a | New |
| Med | Construct/identify safe rooms in Group Homes and ALFs | 1,3,5 | Wind | Both | Various | n/a | Private | n/a | New |
| Med | Develop Emergency Action Plans for Public Buildings | 1,3,5 | All Jurisdictions | Both | All Jurisdictions | n/a | Local | n/a | New |
| Med | Enforce Fire Prevention Ordinance | 1 | Fire | Both | Hardee County Fire Rescue | n/a | Local | Ongoing | New |
| Med | Utilize Grant Funding for Post-Disaster Code Enforcement | 1 | All | Existing | All Jurisdictions | Unknown | FEMA/HMGP | As Necessary | New |
| Med | Elevate Lift Station on SR 64 | 1,3 | Flood | Both | Town of ZS Admin. | Unknown | State | 30 days | New |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Med | Harden fueling station at county barn | 1,3 | Wind | Existing | Hardee County Public Works | Unknown | HMGP | 90-120 days | New |
| Med | Harden fueling station at bus garage | 1,3 | Wind | Existing | HCSB | Unknown | HMGP | 90-120 days | Deferred – requires additional project information |
| Med | Harden and generate fueling station | 1,3 | Wind | Existing | COW Planning | $100,000 | Wauchula CIP | 90-120 days | New |
| Med | Incorporate mitigation into other planning mechanisms | 2,4 | All | n/a | All Jurisdictions | n/a | Local | Ongoing | New |
| Low | Drainage Project on Doyle Parker | 1 | Flood | Both | City of BG Admin. | $35,000 | HMGP | 30-60 days | New |
| Low | Drainage Improvements near Citrus Valley MHP | 1 | Flood | Existing | COW and Hardee County Public Works | Unknown | HMGP | 60-90 days | New |
| Low | SR 64 Elevation or Culvert Upgrade in 3 locations | 1 | Flood | Both | Hardee County Public Works | Unknown | Local | 90-120 days | In Progress |
| Low | Enforcement of Water Restrictions per Southwest Florida Water Management District | 1 | Drought | Both | All Jurisdictions | Unknown | Local | Ongoing | New |
| Low | Develop Secondary Egress for FINR | 1 | Wildfire | Existing | Hardee County EM | Unknown | HMGP | 30 days | New |
| Low | Develop Secondary Egress for Applicable Subdivisions/Residential Developments | 1 | Wildfire | Existing | Hardee County EM | Unknown | HMGP | 30 days | New |
| Low | Revise Floodplain Ordinance After FIRM Map Update | 1,3,4,6 | Flood | New | All Jurisdictions | n/a | n/a | n/a | New |
| Low | EOC retrofit and enhancements | 1,3 | All Hazards | Existing | Hardee County EM | $110,000 | FEMA/Local | Ongoing | As Necessary |
| High | Harden Chlorination Building | 1, 3 | Wind | Existing | City of Bowling Green | $125,000 | Local/HMGP | 30-60 Days | Ongoing |
| Med | Dam/Containment Areas that require Hardening/Mitigation | 1 | All Hazards | Both | Hardee County EM | Unknown | Private/HMGP | Ongoing | New |
| High | Install Automatic Transfer Switch and Generator at Fire Station 2 | 1, 3 | All Hazards | Existing | Hardee County EM | $18,000 | HMGP | 90-120 Days | New |
| Med | Tree Trimming and Limb Removal Information Distribution | 1 | All Hazards | Both | All Jurisdictions | $500.00 | Local/HMGP | Ongoing | New |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| High | Update all Hydrant Systems | 1, 3 | All Hazards | Both | All Jurisdictions | $1,100 (Per Hydrant / COW~233 COBG~25 TOZS~60) | Local/HMGP | Ongoing | New |
| High | Harden and Generate Hardee County Public Works Building Complex | 1, 3 | All Hazards | Existing | HC Public Works | $2,500 | Local/HMGP | Ongoing | New |
| High | City of Wauchula / Ditch Project that runs East & West from 1st Street over to Griffin on the Northside of Green Street | 1, 3, 4, 6 | Flood | Existing | City of Wauchula | $550,000 | Local/HMGP | As Necessary | New |
| High | Elevate Parkview Terrace | 1, 3, 5, 6 | Flood | Existing | Town of ZS Admin. | Unknown | HMGP | 90-120 Days | New - relisted from Deleted Projects |

# Completed/Deleted Mitigation Projects

| Completed and Deleted Mitigation Projects and Programs | | | | | | |
|---|---|---|---|---|---|---|
| **Project or Program** | **Mitigation Goal(s) Addressed** | **Hazard(s) Mitigated** | **Addresses New or Existing** | **Responsible Agency** | **Estimated Cost** | **Status as of Oct. 2014** |
| Countywide radio communications system | 1,5 | All | n/a | HC Fire Rescue | $1,600,000 | Completed |
| Strengthen courthouse | 1,3 | Wind | Existing | Buildings & Grounds | $450,000 | Completed |
| Shutter Resthaven | - | - | Existing | Buildings & Grounds | $28,000 | Deleted – Engineer concerns over structure interfered with permitting process |
| Flood-proof Annex II | 1,3 | Flood | Existing | Buildings & Grounds | $111,985 | Completed |
| Rehab lift stations | - | - | Existing | City of BG | $75,000 | Completed |
| Harden chlorination building | - | - | Existing | City of BG | $125,000 | Request re-approval for current project list |
| Harden Health Dept to serve as special needs shelter | - | - | Existing | Buildings & Grounds | - | Deleted – South Florida State College was designated as the Special Needs Shelter |
| Drainage improvement request from citizen | 1 | Flood | Existing | Emergency Management | $50,000 | Completed |
| Install drainage features on Mott Rd. and Lost Acres Rd. | 1 | Flood | Both | Public Works | $90,000 | Completed |
| 7th St Lift Station Elevation | 1,3 | Flood | Both | Town of ZS | $7,500 | Completed |
| Shutter City Hall | 1,3 | Wind | Existing | Town of ZS | $25,000 | Completed |
| Elevate Parkview Terrace | - | - | Both | Town of ZS | - | Re-approval submitted for current project list |
| Elevate lift station #5 | 1,3 | Flood | Both | City of Wauchula | $7,500 | Completed |
| Develop wildfire protection plan | 1,2,3,4,5 | Wildfire | Both | Emergency Management | n/a | Completed |

| | | | | | | |
|---|---|---|---|---|---|---|
| Drainage at Jail | 1, 3 | Flood | Existing | Emergency Management | $17,000 | Completed |
| Installation of Lightning Arrestor at Historic Hall | 1, 3 | Lightning | Existing | Hardee County Sheriff's Office | $714,000 | Completed |
| New Homeowner Sinkhole Information Distribution | 1, 5 | Sinkhole | n/a | COW Planning | Unknown | Completed |
| Fire Station #1 Wind Retrofit | 1, 3 | Wind | Existing | Emergency Management | $17,000 | Completed |