

RESOLUTION 2021-011

A RESOLUTION OF THE CITY COMMISSION OF THE CITY OF FRUITLAND PARK, FLORIDA, ADOPTING THE LAKE COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, the Florida Division of Emergency Management and the Federal Emergency Management Agency recommends that all local governments, in cooperation with their local county emergency management agency, develop and maintain a Hazard Mitigation Plan; and

WHEREAS, Lake County has prepared and adopted the Lake County Multi-Jurisdictional Hazard Mitigation Plan dated February 9, 2021, and the City of Fruitland Park desires to have and maintain this plan to protect the life and property of its citizens; and

WHEREAS, Lake County, in cooperation with the municipalities of Lake County, including the City of Fruitland Park, has developed the plan, policies and procedures necessary to plan and develop projects to protect the citizens of Lake County from hazards; and

WHEREAS, the City Commission finds it beneficial to the City of Fruitland Park and desires to the above-referenced mitigation plan.

NOW THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF FRUITLAND PARK, LAKE COUNTY, FLORIDA, AS FOLLOWS:

Section 1. The Lake County Multi-Jurisdictional Hazard Mitigation Plan dated February 9, 2021, a copy of which is attached hereto, is hereby adopted.

Section 2. This resolution shall take effect immediately upon its adoption by the City Commission of the City of Fruitland Park, Florida.

PASSED AND RESOLVED this 8th day of April, 2021, by the City Commission of the City of Fruitland Park, Florida.

SEAL

CITY COMMISSION OF THE CITY OF
FRUITLAND PARK, FLORIDA



Chris Cheshire, MAYOR

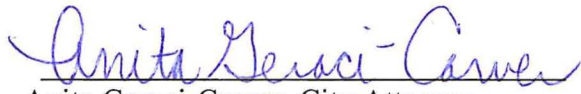
ATTEST:



ESTHER COULSON, CITY CLERK, MMC

Mayor Cheshire	<u> / </u>	(Yes),	<u> </u>	(No),	<u> </u>	(Abstained),	<u> </u>	(Absent)
Vice Mayor Gunter	<u> / </u>	(Yes),	<u> </u>	(No),	<u> </u>	(Abstained),	<u> </u>	(Absent)
Commissioner Bell	<u> / </u>	(Yes),	<u> </u>	(No),	<u> </u>	(Abstained),	<u> </u>	(Absent)
Commissioner DeGrave	<u> / </u>	(Yes),	<u> </u>	(No),	<u> </u>	(Abstained),	<u> </u>	(Absent)
Commissioner Mobilian	<u> / </u>	(Yes),	<u> </u>	(No),	<u> </u>	(Abstained),	<u> </u>	(Absent)

Approved as to form and legality:



Anita Geraci-Carver, City Attorney



Local Mitigation Strategy: Multi-Jurisdictional Plan

2020

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SUMMARY OF CHANGES

The Summary of Changes will list the routine updates that will be made to the LMS Plan once it has been accepted. Changes made to the 2020 plan will be archived by Lake County Emergency Management. This plan is a living document and can be changed at any time by the LMS Working Group. Continual citizen participation and input by all interest parties is encouraged.

Change	Comments/Purpose	Date	Pages
Plan Update	Plan was updated and revised in entirety.	2020	All

EXECUTIVE SUMMARY

Lake County is vulnerable to a variety of natural, technological, and human-caused hazards which threaten the health and wellbeing of the community, affect economic health, and pose harm to the environment. Lake County Emergency Management has convened a group of individuals representing the county, the municipalities, and other interested parties to comprise the members of the Lake County Local Mitigation Strategy Working Group (LMS Working Group) to monitor and update this continual planning process.

This document is the result of a multi-jurisdictional approach to mitigation planning. Lake County along with its municipalities formally adopted the existing Lake County Local Mitigation Strategy (2015) and once this revision is approved, this updated document will be presented for adoption via a new resolution.

The LMS Working Group conducted research to identify the hazards threatening Lake County in order to estimate risk, impacts, and potential consequences relating to public, responder safety, continuity of operations, continuity of government, property, facilities, infrastructure, environment, economic issues, and public confidence in the county. The natural hazards in the LMS are mirrored in the Comprehensive Emergency Management Plan (CEMP) for continuity and to facilitate an all-hazards approach to planning.

Proposed projects and programs intended to reduce impacts of future natural disasters are called mitigation projects. Mitigation projects are included in the project list and continue to be developed and added to the list by the LMS Working Group as new hazard research is available, risk increases, and as resources and opportunities become available. Implementing the LMS will help make Lake County more resistant to the effects of major disasters.

The LMS will continue to be updated and expanded in the future to address changing hazards, reflect the experiences of future disasters, and changes in the participating jurisdictions. The update process and future versions of the LMS will be used to inform the public and encourage other interested parties to participate more in making Lake County resilient.

I. INTRODUCTION

Mitigation is any action taken to permanently reduce or eliminate the risk to people and their property from the effects of hazards. The Lake County Local Mitigation Strategy attempts to reduce some of the risk associated with hazards by implementing mitigation projects within Lake County and its municipalities. The LMS process is intended to be a framework for documenting the activities of the LMS Working Group and the future mitigation activities within the County. This plan includes updated bylaws of the LMS Working Group; and, the overall planning process is intended to make the LMS Working Group more active in the coming years as well as find ways to further promote public participation. The LMS Working Group has been established to prepare the community to be more resistant and resilient to the effects of future disasters.

A. Purpose

The purpose of the LMS is to provide an on-going process that will encourage hazard mitigation efforts as part of the ongoing planning efforts of Lake County. The LMS encourages evaluation of all hazards to evaluate vulnerabilities and develop goals, objectives, plans, programs, and projects to lessen the effects of those hazards and prioritize implementation of projects to further these goals.

B. Planning Process

The LMS Working Group is made up of representatives from Lake County governmental agencies, incorporated municipalities, organizations and associations representing key business industry, community interest groups, other governmental entities, and non-profit or faith-based groups. Interested citizens are always welcome and encouraged to become involved in the process. The Lake County LMS Working Group by-laws are located in Appendix II of this document and were updated in this planning process.

The LMS Working Group encourages involvement in the mitigation planning process by each jurisdiction in Lake County. Jurisdictions are encouraged to identify others that should be participating on the LMS Working Group. In the past, annual meetings have been held in December of each year for the purpose of preparing the annual update to be submitted. In January of 2020, the Committee voted to move to a quarterly meeting schedule. The 5-year planning update kick-off meeting was held on March 10, 2020 with Lake County Emergency Management representatives followed by a meeting on May 8, 2020 with the LMS Working Group. The LMS Working Group was noticed through email distribution with follow-up phone calls from the LMS Coordinator. A formal public meeting was held on August 8, 2020 with the LMS Working Group noticed via email distribution, website notice, and public notification. Further efforts by the Chair and Vice-Chair to encourage participation and attention at meetings continued in preparation for submission to the Florida Division of Emergency Management.

a) Review of Community Capabilities and Incorporation of Existing Plans

Lake County communities currently have several existing programs and plans related to hazard mitigation and post-disaster redevelopment as listed in Appendix I-E of this Plan which includes but is not limited to:

- Lake County Comprehensive Emergency Management Plan (CEMP) - The CEMP was used to help identify the pertinent hazards for the LMS risk assessment.

- Lake County Comprehensive Plan and Jurisdictional Comprehensive Plan(s) – The Comprehensive Plan(s) were used to determine the direction of future growth, goals, and objectives of the County and each jurisdiction.
- Jurisdictional Master Plans (City of Leesburg and City of Tavares) – Helped identify future growth opportunities and plans, identified environmental impacts, and mitigation opportunities.
- Lake County Code of Ordinances Chapter VI – Resource Protection Standards, 6.01.02: Wetlands Impact and Mitigation, and the Lake-Sumter Metropolitan Planning Organization (MPO) Transportation Plan – Codes were used to determine potential mitigation measures.
- Lake County Community Wildfire Protection Plan (CWPP) – Identified wildfire vulnerabilities within the County.

C. Participating Organizations

Lake County encourages participation from all of its jurisdictions and enables any entity within the jurisdictions or unincorporated county to be involved in the planning effort. Those involved in the process include: Astatula, Clermont, Eustis, Fruitland Park, Groveland, Howey-in-the-Hills, Lady Lake, Lake County, Leesburg, Mascotte, Minneola, Montverde, Mount Dora, Tavares, Umatilla, and The Villages.

This is the inclusive list of all jurisdictions that must approve the LMS as a multi-jurisdictional plan. Each jurisdiction is responsible for actual implementation of the plan within their boundaries and ensuring that their projects meets the needs of the communities. Participation will be identified by attendance at meetings, both in person and virtual, and active involvement in the process. These are the same jurisdictions that were involved in the 2015 plan. The desire of this plan is to foster further participation from all municipalities and to meet on a more consistent basis in the future.

Participation in the planning process included the following entities:

- | | |
|--|--|
| <i>Advanced Planning Consultants, LLC</i> | <i>Lake County Emergency Management</i> |
| <i>City of Clermont</i> | <i>Lake County Public Works Department</i> |
| <i>City of Eustis</i> | <i>Lake County Schools</i> |
| <i>City of Leesburg</i> | <i>Lake County Stormwater Section</i> |
| <i>City of Mount Dora</i> | <i>Lake County Office of EMS</i> |
| <i>City of Tavares</i> | <i>Town of Montverde</i> |
| <i>City of Umatilla</i> | <i>Villages Community Development District</i> |
| <i>Florida Department of Health in Lake County</i> | <i>Withlacoochee Forest Center</i> |

The LMS Working Group has had participation from all remaining jurisdictions due to contact with each entity by members of the Office of Emergency Management to obtain updated information

for the LMS Update. Email meeting notices are sent to any and all interested parties both within and outside of Lake County to encourage participation.

D. Public Participation

The LMS Working Group has benefited from the assistance and support of its many members and support staff and intends to continue its efforts to engage more members of the community in the planning process, including more representatives of the private sector. The public will have additional opportunities to provide input on this updated LMS Plan, such as through the Lake County website and municipal meetings where the plan will be formally adopted by resolution within each Lake County community. A copy of the Local Mitigation Strategy for Lake County is available on the county website at: https://lakecountyfl.gov/offices/emergency_management/. This webpage also provides other mitigation information to the public along with a contact link back to the Office of Emergency Management.

The LMS Working Group welcomes public input and encourages participation through legal notices of upcoming public meetings. Future meetings which may be conducted utilized web conferencing will also include a gathering at the Emergency Operations Center for interested parties to attend, listen, and participate in the planning process. Once the updated plan is posted on the website, opportunity for public comment and input will be available prior to adoption.

Public input during held meetings is captured within the meeting minutes (Appendix I-C). Comments are addressed by the Committee for incorporation into the document. As noted, public input options are available via the County website, however, no comments were received for the 2020 submission.

Once the plan is adopted, it will remain on the website, available for public comment and input in an ongoing process. In addition to this planning process, many of the jurisdictions maintain their own efforts to inform the public about potential hazards, hazard mitigation, and this planning process. Lake County and the LMS Working Group will continue efforts to develop a more robust planning process and encourage more participation and involvement from the jurisdictions, interested parties, and the public.

E. Update Process

During the 2020 Lake County LMS Update, the LMS Working Group took the following actions:

- In 2016, 2017, 2018, 2019 and 2020 annual meetings of the LMS Working Groups were noticed to the public and held with attendance and meeting minutes provided to document the process.
- In March 2020, Lake County Emergency Management hired a consultant to assist in the update process.
- The plan was reviewed and rewritten to be compliant with the 2020 Florida Local Mitigation Strategy Crosswalk
- The General Section include the Introduction, purpose, and planning process and was revised to reflect the current approach.

- The Risk Assessment Section was reviewed for applicable hazards and to be consistent with the Lake County Comprehensive Emergency Management Plan (CEMP).
- Mitigation Goals Section includes the goals, projects list, National Flood Insurance (NFIP) and Community Rating System (CRS) and was updated to reflect the current list, current NFIP and CRS information.
- Plan Maintenance Section include monitoring and evaluation; the update process; and process for project implementation and was updated to reflect the current approach.
- LMS Working Group By-Laws Appendix contains the policies of the LMS Working Group and was updated to include the current practices.

The Draft Plan was provided to the LMS Working Group for their review and comment. Another meeting will be conducted to review the Final Draft and approve all changes. The LMS Working Group will continue to solicit input from anyone who may have an interest in the process and include any additional parties as needed as required by Florida Administrative Code 27P-22.

As with the 2015 LMS update, the 2020 LMS goals, objectives, and priorities remain unchanged and continue to guide this document as is consistent with the County goals and priorities.

II. HAZARD IDENTIFICATION AND VULNERABILITY ASSESSMENT

A. Introduction

The purpose of the hazard identification and vulnerability assessment is to use best available information and technology to identify and evaluate potential hazard risks facing Lake County, as well as provide the factual basis for mitigation activities proposed in Lake County's LMS that aim to reduce those risks. The vulnerability assessment provides for the identification and analysis of known hazards that may threaten life and property across the entire planning area. It also includes the results of a multi-jurisdictional vulnerability assessment conducted for each of Lake County's municipal jurisdictions to determine where locally specific risks vary from those facing the rest of the county.

Lake County is vulnerable to a wide range of hazards that threaten life and property. FEMA's current regulations and guidance under the Disaster Mitigation Act of 2000 (DMA 2000) require, at a minimum, an evaluation of a full range of natural hazards. The Hazards within the Lake County LMS are broken up into two main hazard types:

- Natural Hazards - Are threats of a naturally occurring event will have a negative effect on life, property and the environment.
- Societal Hazards - are hazards that are created by humans or hazards that directly impact humans by means other than a natural or technological incident.
- Technological Hazards - Include those that are caused by man-made technological advancements, although some can be a result of natural hazards in specific circumstances.

B. Initial Hazard Identification

The potential hazards that may affect the residents and visitors to Lake County are reviewed on a regular basis. Each jurisdiction will be addressed individually however we begin with a general overview at the county level of each of the hazards. This plan is in line with FEMA's guidance by focusing on hazards that directly affect Lake County.

Each of the initially identified hazards were studied for their potential impact on Lake County as well as in terms of the availability of hazard mitigation strategies to reduce that impact. Best available data on historical occurrences, the geographic location, and extent, as well as the probability of future occurrences, were collected and reviewed as part of the hazard identification process in the following sections.

The table below lists the range of hazards identified in this risk assessment:

Table 1: Hazard Identification by Type

Type	Hazard	Hazard-Specific Effects
Natural	Drought	Extreme Temperatures
Natural	Flooding	
Natural	Hail	
Natural	Extreme Heat	Drought
Natural	Tropical Cyclone Events	High Winds; Flood; Tornadoes
Natural	Thunderstorms/Wind/Lightning	Wildfire
Natural	Sinkholes/Subsidence	
Natural	Tornadoes	High Winds
Natural	Wildland Fire/Wildfire	
Natural	Erosion	
Natural	Winter Storm/Freeze	
Natural/Societal	Epidemic/Pandemic	Mass Casualty/Fatality
Technological	Dam/Levee Failure	Flooding
Technological	Hazardous Materials	Fixed Facilities; Transportation; Radiological Release; Biological
Technological	Cyberterrorism	Critical Infrastructure Disruption
Technological	Terrorism	Mass Casualty/Fatality
Technological	Prolonged Utility/Communications Failure	Critical Infrastructure Disruption
Societal	Civil Disorder/Disturbance	
Societal	Mass Casualty	

Some hazards are not listed due to the geographic location and characteristics of the planning area, and are not relevant to Lake County and the participating jurisdictions, i.e. volcanoes and earthquakes. There are no volcanoes in the Southeast United States that would impact Lake County. Additionally, past impacts and potential future impacts due to earthquakes are considered negligible and, therefore, not included in this plan.

C. Probability Summary

Each hazard is described and ranked based on relative risk using probability and severity as the identified measures.

Probability is based on historical information and considers the likelihood that Lake County will see an impact by the hazard within a given period of time.

- **N = None:** No previous occurrence and considered no threat
- **L = Low:** Some potential every 16 years or more
- **M = Moderate:** Potential occurrence every 3 to 15 years
- **H = High:** Potential to exist every 1 to 2 years

Based on the history of the hazards occurring and all available information, a summary of probabilities table has been created to determine then likelihood of a hazard occurring within a certain number of years. **Table 2** indicates summary probabilities for the hazards identified in this plan.

Additionally, impacts are addressed by how the populations and structures could potentially be affected. It is important to note that a hazard with a low probability of occurring can be just as severe as one with a high probability of occurring. **Table 3** indicates the potential impact a hazard may have based on the following criteria.

- **N = None:** No impact expected
- **L = Low:** Special portions of the population affected; day to day operations not affected; minor cosmetic damage to structures possible
- **M = Moderate:** Approximately 50% of population affected; mobile homes and poorly built or maintained structures impacted
- **H = High:** Significant portions of the population impacted; major damage to old, poorly maintained mobile home structures; some damage to structures built to recently approved building code

Table 2: Summary Probabilities for Hazards to Locality

	Drought	Flooding	Hail	Excessive Heat	Tropical Cyclone Events	Thunderstorm Lightning/Wind	Sinkholes	Tornadoes	Wildfire	Erosion	Winter Storm Freeze	Dam/Levee Failure	Hazardous Materials	Epidemic/Pandemic	Civil Disorder/ Disturbance	Terrorism	Cyberattack/ Cyberterrorism	Mass Casualty	Prolonged Utility/ Comms. Failure
Lake County	M	H	H	M	M	H	M	M	M	L	M	L	M	M	L	L	H	L	M
Astatula	M	M	M	M	M	H	M	M	M	L	M	L	L	M	L	L	H	L	M
Clermont	M	M	M	M	M	H	M	M	M	M	M	L	L	M	L	L	H	L	M
Eustis	M	M	M	M	M	H	M	M	M	L	M	L	L	M	L	L	H	L	M
Fruitland Park	M	M	M	M	M	H	M	M	M	L	M	L	L	M	L	L	H	L	M
Groveland	M	M	M	M	M	H	M	M	M	L	M	L	L	M	L	L	H	L	M
Howey-in-the-Hills	M	M	M	M	M	H	M	M	M	L	M	L	L	M	L	L	H	L	M
Lady Lake	M	M	M	M	M	H	M	M	M	L	M	L	L	M	L	L	H	L	M
Leesburg	M	M	M	M	M	H	M	M	M	L	M	L	L	M	L	L	H	L	M
Mascotte	M	M	M	M	M	H	M	M	M	L	M	L	L	M	L	L	H	L	M
Minneola	M	M	M	M	M	H	M	M	M	L	M	L	L	M	L	L	H	L	M
Montverde	M	M	M	M	M	H	M	M	M	L	M	L	L	M	L	L	H	L	M
Mount Dora	M	M	M	M	M	H	M	M	M	L	M	L	L	M	L	L	H	L	M
Tavares	M	M	M	M	M	H	M	M	M	L	M	L	L	M	L	L	H	L	M
Umatilla	M	M	M	M	M	H	M	M	M	L	M	L	L	M	L	L	H	L	M
Villages, The	M	M	M	M	M	H	M	M	M	L	M	L	L	M	L	L	H	L	M

Table 3: Summary Potential Hazard Impact to Locality

	Drought	Flooding	Hail	Excessive Heat	Tropical Cyclone Events	Thunderstorm Lightning/Wind	Sinkholes	Tornadoes	Wildfire	Erosion	Winter Storm Freeze	Dam/Levee Failure	Hazardous Materials	Epidemic/Pandemic	Civil Disorder/Disturbance	Terrorism	Cyberattack/Cyberterrorism	Mass Casualty	Prolonged Utility/Comms. Failure
Lake County	M	H	L	M	H	H	L	M	M	L	L	L	H	H	L	M	H	M	H
Astatula	M	H	L	M	H	H	L	M	M	L	L	L	H	H	L	M	H	M	H
Clermont	M	H	L	M	H	H	L	M	M	M	L	L	H	H	L	M	H	M	H
Eustis	M	H	L	M	H	H	L	M	M	L	L	L	H	H	L	M	H	M	H
Fruitland Park	M	H	L	M	H	H	L	M	M	L	L	L	H	H	L	M	H	M	H
Groveland	M	H	L	M	H	H	L	M	M	L	L	L	H	H	L	M	H	M	H
Howey-in-the-Hills	M	H	L	M	H	H	L	M	M	L	L	L	H	H	L	M	H	M	H
Lady Lake	M	H	L	M	H	H	L	M	M	L	L	L	H	H	L	M	H	M	H
Leesburg	M	H	L	M	H	H	L	M	M	L	L	L	H	H	L	M	H	M	H
Mascotte	M	H	L	M	H	H	L	M	M	L	L	L	H	H	L	M	H	M	H
Minneola	M	H	L	M	H	H	L	M	M	L	L	L	H	H	L	M	H	M	H
Montverde	M	H	L	M	H	H	L	M	M	L	L	L	H	H	L	M	H	M	H
Mount Dora	M	H	L	M	H	H	L	M	M	L	L	L	H	H	L	M	H	M	H
Tavares	M	H	L	M	H	H	L	M	M	L	L	L	H	H	L	M	H	M	H
Umatilla	M	H	L	M	H	H	L	M	M	L	L	L	H	H	L	M	H	M	H
Villages, The	M	H	L	M	H	H	L	M	M	L	L	L	H	H	L	M	H	M	H

D. Hazard Profiles

b) Drought

1. *Description*

A drought is a period of time when an area or region experiences below-normal precipitation. The lack of adequate precipitation, can cause reduced soil moisture or groundwater, diminished stream flow, crop damage, and a general water shortage.

2. *Location and Extent*

All areas of Lake County are subject to the effects of drought conditions. Since Lake County has a large number of lakes, drought effects of lowered water levels may impact tourism for those that participate in activities on the water. Resident populations would not be unduly affected other than an inconvenience. Agricultural concerns such as the horticulture, animal services, citrus, and vegetable crops could be affected by a long-term drought which could have a negative economic effect. Critical facilities and infrastructure would likely be unaffected. Considering these factors, a drought would have a low impact to residents and critical infrastructure but have more moderate impact to agriculture.

The extent of drought in Florida is generally measured through one of two indices, the Keetch-Byram Drought Index (KBDI) or the U.S. Drought Monitor Index. While Lake County historically has not been immune to regional or statewide droughts, recent population growth has accelerated the depletion of water supplies. The KBDI has a range from 0 for no drought to 800 being the most severe drought. Table 3 summarizes the mean KBDI for Lake County since 2011.

Table 4: Keetch-Byram Drought Index (KBDI) for Lake County, Florida (2011 – 2020)¹

Date	KBDI
June 5, 2011	559
December 5, 2011	437
June 5, 2012	367
December 5, 2012	499
June 5, 2013	99
December 5, 2013	454
June 5, 2014	344
December 5, 2014	81
June 5, 2015	449
December 5, 2015	N/A²
June 5, 2016	N/A
January 1, 2017	457
June 5, 2017	431
December 5, 2017	359
June 5, 2018	55
December 5, 2018	405
June 5, 2019	447
December 5, 2019	274

¹ <http://currentweather.freshfromflorida.com/current-report.html>

² Data only available for prior 3 years from current date

3. *Previous Occurrences*

During 1977, a two-month dry emergency caused an estimated \$30,000,000 in damages to Florida, and the Governor declared a three-month drought during 1979, the worst since 1971.

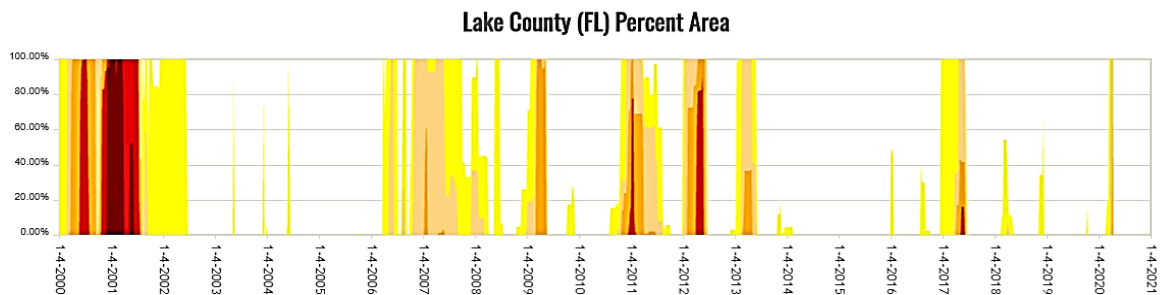
The drought from 1997-2002 was considered to be a “very serious” drought according to the St. John’s Water Management District. Lake County instituted water restrictions for itself at the same time that many other counties were doing the same. This drought also played a role in the extensive wildfires and sinkholes that occurred during the summers of this time period.

Since 2000, the longest duration of drought (D1-D4) in Florida lasted 124 weeks beginning on April 11, 2006 and ending on August 19, 2008. The most intense period of drought occurred the week of February 27, 2001 where D4 (Exceptional Drought) affected 39.08% of Florida land.³

No major drought events have taken place since the last LMS update.

The figure below shows a 20-year comparison of drought by condition for Lake County. D4 drought conditions are defined as conditions where exceptional and widespread crop/pasture losses occur as well as shortages of water which create water emergencies.

Figure 1: 20-Year Drought Comparison for Lake County, FL (2000 – 2020)



4. *Probability of Future Events*

As of January 2020, the Palmer Drought Severity Index (PDSI) categorized the region in a “moderate (D1) to severe (D2) drought.” Using historical records, it can be estimated that Lake County will experience at least one drought every two to three years.

There is no way to predict when a drought will occur or how long it may last. Drought conditions existed in Florida from 1965 through 1982, from 1997 to 2002, 2006 to present with some relief the rainy months in 2013 and 2014. The conditions of various areas of the state have are affected to different degrees.

5. *Vulnerability and Risk Assessment*

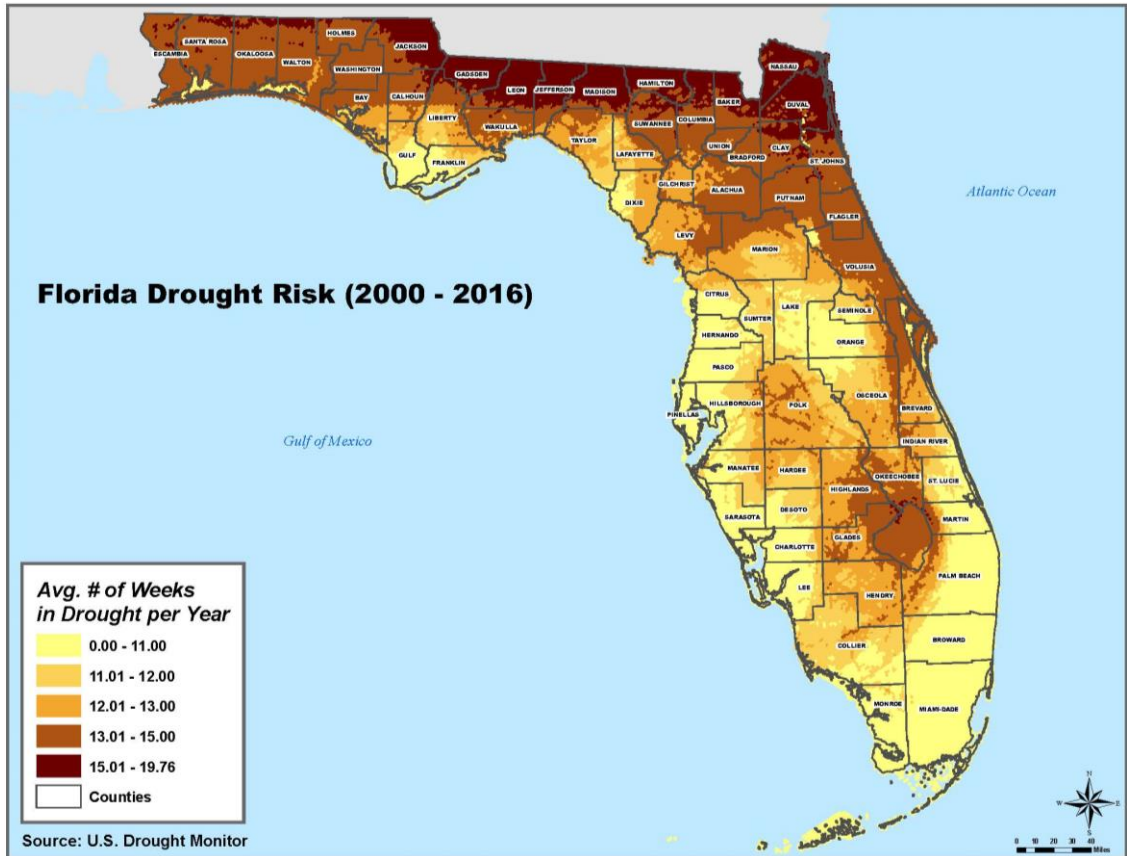
It is increasingly likely that Lake County could have another drought or extreme heat event. Extreme heat events can occur simultaneously with drought, but either can occur without

³ <https://www.drought.gov/drought/states/florida>

the other. While extreme heat events can cause death to any person of any age, the elderly, very young, and mobility restricted are considered the most at risk.

It is expected that the county could see an average of up to 12 weeks or more of drought each year (Figure 1) based on the average number of weeks of drought that occurred from the year 2000 through 2016 according to the data acquired from U.S. Drought Monitor (<https://droughtmonitor.unl.edu/>).

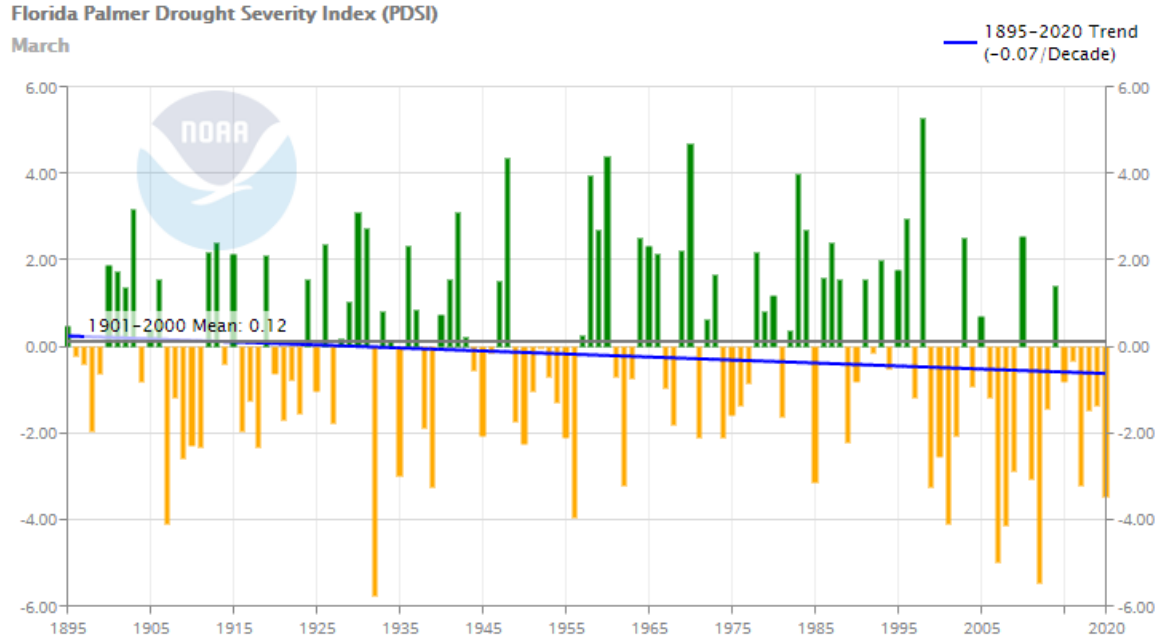
Figure 2: Florida Drought Risk (2000 - 2016)



Lake County is uniformly vulnerable to drought. Drought is typically associated with crop damage, and not necessarily the built environment (i.e., improved property). In a worst-case scenario, drought within Lake County could reach moderate to severe levels (400 to 800) out of a potential score of 800 on the KBDI Index.

The Palmer Drought Severity Index data for the State of Florida from 1895 to 2020 has shown a trend of more frequent severe drought conditions as seen in the figure below.

Figure 3: Florida PDSI Trend (1885 - 2020)



Lake County has experienced mostly moderate drought conditions over the last five years. Heavy rains during the rainy season can reduce the drought index substantially, however dry spells can increase the number in a relatively short time period. It is important to note that during prolonged cold spells when conditions are often windy, it will make conditions dry very quickly. Fires can be triggered from careless activities during extremely dry periods and water consumption may have to be curtailed if consumptions exceed rainfall and replenishment of the water table.

During a drought water levels in rivers and lakes would become lower, as would the water table. Local governments and water management districts within the County would find it necessary to impose water usage restrictions. Farmers would be particularly affected by the drought conditions, as the water table fell and deeper wells had to be drilled for irrigation purposes.

c) Flooding

1. *Description*

Flooding is a general and temporary condition of partial or complete inundation of normally dry land areas from:

- The overflow of inland or tidal waters;
- The unusual and rapid accumulation or runoff of surface waters from any source

For the state as a whole, flooding is a problem due to much of the state being at sea level. Lake County is very fortunate to have more elevation than other counties due to its interior

location. While flooding can result from either storm surge associated with hurricanes, by riverbank overflow, or by pooling of water, it is the latter two that represent a potential hazard to Lake County. Heavy rains within a drainage area and the inability of a river to accommodate the added runoff can cause flooding resulting in overflow. Storm water runoff is also a problem that occurs because of poor urban development in areas subject to flash flooding. Hurricane-induced flooding can also present problems for low-lying areas of Lake County. These areas may experience flooding from either a "direct hit" or a storm that passes close by. Rainfall varies with each hurricane; however, on the average, the normal hurricane delivers between ten and twelve inches of rain. Non-tropical storm systems can also linger and be significant rainmakers as well.

2. *Location and Extent*

Topography in Lake County is varied. Ground elevations range from less than 5 feet above National Geodetic Vertical Datum of 1929 (NGVD) along the St. Johns River to a high of 312 feet NGVD (USGS; 7.5 min. Quads). Landforms in Lake County are of three basic types: ridges, valleys, and uplands. Lake County has 1,345 lakes whose surface areas are 2.5 acres or more. About 32 percent of the county is taken up by lakes, swamps, and marshes; 33 percent by open undeveloped land; 21 percent by agriculture; 12 percent by Ocala National Forest; and 2 percent by urban use.

Lake County has more than 1,300 lakes comprising a total of 202 square miles. 45.5 percent of the county's acreage is in the 100-year floodplain. According to Federal Emergency Management Agency Flood Insurance Rate Maps (FIRM), most of the county's 100-year floodplain area lies in A, ANI, AO, or AH flood zones, with about 21% in the AE Zone. Certain areas of Lake County are low-lying and subject to flooding from rising water. Specific areas include those along the western shores of Lake Apopka, the complete shoreline of Lake Louisa, the western shorelines of Lake Minnehaha and Lake Minneola, the complete shoreline of Lake Dora, Lake Yale, Lake Akron, and along the entire western shoreline of the St. John's River. Many of the lakes could be impacted as well, although drainage wells and improved drainage systems have mitigated problems in these areas.

There are three primary areas within Lake County that would typically be affected by rain events: the St. Johns River area in extreme Northeast Lake County, the Green Swamp area in Southern Lake County and the Wekiva River area that straddles Seminole County to the east. These areas could have issues if heavy rains fell simultaneously in the counties surrounding Lake County, adding to the volume of runoff. Aside from these primary areas, ponding could occur anywhere in Lake County in low areas that are characterized by either poorly drained or supersaturated soils (high water table). There are no specific drainage patterns that aggravate flood conditions in the County, according to the St. John's River Water Management District.

Lake County has a vested interest in participating in the federal floodplain mapping project and the Community Rating System (CRS), where appropriate, in order to assist homeowners and businesses with decisions about property vulnerability and flood insurance. The National Flood Insurance Program (NFIP) allows property owners in the 100-year flood zone to acquire federal flood insurance policies on land subject to flood hazards. Only the county participates in the CRS a Federal Emergency Management Agency (FEMA) program, which qualifies residents for reduced rates on flood insurance.

These vary depending on the level of activities the jurisdiction performs to reduce its flood potential.

With regard to determining the extent of magnitude and severity of flooding that has taken place, there is not a scale like hurricanes and tornadoes. Even what has been considered as “minor” flooding could impact roadways, structures and the quality of life of residents. However, one tool that can measure severity along waterways is available from the National Weather Service. A river gauge had been installed at the St. Johns River in Astor to monitor the flood stage of the river to generate forecasts to better warn residents of potential flooding conditions.

In summary, Lake County has an abundance of lakes and fresh water bodies within its boundaries. The County itself lies above the aquifer that hydrates much of the Central Florida region. Southwest Lake County is an Area of State Environmental Concern, as it is an environmentally sensitive recharge area. The various maps provided that identify areas within the 100-year flood plain are merely tools to assist in planning. This is not to say that areas outside of the 100-year flood plain will not flood, because that simply is not the case. In recent years in the United States, it has been said that people have been caught off guard because the maps and plans said that they would not flood. However, the reality is that the State of Florida is extremely flat and subject to flooding a great deal more than other states. Lake County and municipal partners need to continue to monitor drainage patterns and reoccurring flood areas to pursue future mitigation activities.

3. *Previous Occurrences*

One of the aspects of living in Florida is the frequent downpours from thunderstorms in the summer months and the moisture sources that can feed storm systems, much of which can cause pooling of water along roadways and low-lying areas. Listing every heavy rain event that has taken place within Florida would be virtually impossible. There have been two significant flooding events in Lake County in the last ten years.

- Hurricane Matthew Flooding, 2016: Rain bands associated with Hurricane Matthew produced a swath of heavy rain of between 3.5 and 4.5 inches from Clermont to Mount Plymouth, resulting in areas of minor urban, roadway and lowland flooding. The St. Johns River near Astor peaked just below moderate flood stage. A total of 10 residents evacuated to shelters within the county due to the potential for river flooding.⁴
- Hurricane Irma Flooding, 2017: Rain bands associated with Hurricane Irma produced rainfall totals between 8 and 12 inches, resulting in areas of urban and poor drainage flooding. Numerous roadways were impacted by significant levels of standing water and many retention ponds reached capacity or overflowed.⁵

4. *Probability of Future Events*

The probability of future occurrence is medium-high as heavy rains associated with low lying areas, poor drainage areas and riverine overflow can result in flooding. Intense rainfall in a short period of time can cause flash flooding. The location and distribution of

⁴ <https://www.ncdc.noaa.gov/stormevents/eventdetails.jsp?id=661662>

⁵ <https://www.ncdc.noaa.gov/stormevents/eventdetails.jsp?id=720120>

the rainfall, the land use and topography, vegetation types and growth/density, soil type, and soil water-content are all contributing factors.

5. *Vulnerability and Risk Assessment*

With the exception of the highly elevated areas of Lake County that are out of the reach of areas that could collect water, all areas are subject to the effects of flooding, including those areas identified as being less likely to flood. For this reason, Lake County and municipal partners need to be vigilant about monitoring flood conditions with future events to enhance their planning efforts. Flooding can impact residential areas with their local roadways and lift stations that may be impacted if they become surrounded with water.

The Astor area has been particularly susceptible and damage is limited to individual homes. Areas along the St. Johns River can be impacted however are limited to individual homes that may become isolated. Emerald Lakes in Clermont has an ongoing flooding issue that is currently mitigated by the efforts of the subdivision. However, if their efforts were to fail there is a wastewater facility that would be inundated and would result in the need to evacuate the subdivision. Most of the county's businesses and critical facilities (including fire facilities and hospitals) are not located in hazardous areas and would likely not suffer impacts that would affect the general population. Given the possible effects to the entire population of Lake County, flooding has been designated to have a high impact potential.

Specific impacts that could occur include:

- Injury/death due to: drowning, vehicle accidents, becoming trapped, exposure to hazardous materials/wastewater.
- Damage to property: mold, repair or replacement of damaged property, issues due to uninsured property damage.

The Flood Risk Map generated from 2013 FEMA Flood Risk Report for Lake County is shown in Appendix III: Maps and Figures - General Flood Zones for Lake County, FL. Additional information regarding flood risks within the county can be found in the FEMA Lake County Flood Risk Report.⁶

d) Hail

1. *Description*

Hail is frozen precipitation that can occur during a thunderstorm. Hail forms when raindrops freeze into balls of ice. Up until January 2010, severe hail in Lake County was defined as three-fourths of an inch (penny size) or larger. However, in January 2010, the National Weather Service raised the hail size criteria for Severe Thunderstorm Warnings from 0.75-inch (penny size) to 1.00 inch (quarter size).

According to the National Weather Service, within Florida, many storms which have the potential for 0.75-inch hail also have the potential to produce 50-knot + (58 mph +) winds. Many storms capable of producing 0.75-inch to just below 1-inch size hail will still require Severe Thunderstorm Warnings for 50-knot + (58 mph +) damaging winds. Special

⁶ Lake County Flood Risk Report accessible from: <https://msc.fema.gov/portal/advanceSearch>

Weather Statements will continue to be issued for "strong storms," generally those with 45-57 mph winds and small hail, below 1.00-inch.

2. *Location and Extent*

Severe thunderstorms can happen anytime of the year in Central Florida and produce hail at any time. Although, hail storm events occur most often during the late winter and early spring severe weather season and as previously mentioned, often accompany thunderstorms or tornadoes. A hail event has no geographic limitations to the area it affects. Therefore, it is presumed that all of Lake County is uniformly at risk to a hail event.

On average, Lake County has seen hail from .75 to 1.75 inches in diameter. Lake County would expect to receive the same size diameter hail and possibly even greater sizes, which may occur from extremely high cloud tops that develop.

Damage from hail increases with the size of the hail and can cause damage to vehicles, aircraft, and homes, and can be fatal to people and livestock. However, Florida thunderstorms do not often include hail because the hailstones usually melt before they reach the ground because of the generally warm temperatures in Lake County.

3. *Previous Occurrences*

Mapping between the years of 1955-2002 indicates fewer than 35 severe hailstorms (using the former criteria) have struck Lake County during that timeframe. A couple of previous occurrences that produced substantial damage include:

- Winter Storm in 1986: A storm that hit Lake County produced hail the size of golf balls in and around the Leesburg area of Lake County.
- Hail Storm of 1992: The most destructive hailstorm in east central Florida history occurred on March 25, 1992 across Lake, Orange, and Seminole counties. An estimated \$60 million dollars in damage occurred, with losses concentrated among nursery greenhouses and car dealerships.

Since 2010 there have been 24 documented hail storm events in Lake County (Table 4) with hail ranging in size from .75 to 1.75 inches in diameter. None of these hail storms resulted in property damage or crop damage or any significance. Locations and dates of hail storms are listed in the table that follows. Should hail occur, it could cause damage to car dealerships and the agricultural enterprises which include greenhouses, horticulture, foliage, and citrus crops. Damage to car dealerships has occurred in the past and could happen again in the future. This could result in an economic effect to the County. Tourism, critical facilities, and infrastructure would likely not be impacted. Other than injuries to individuals that may get caught out in the hail storm, populations would not be affected.

Table 5: Hail Storm Damage in Lake County Florida (2010 – Present)⁷

Location	Date	Size	Damages
Lake Minnehaha	6/15/2011	1.00	-0-
Lake Louisa	4/20/2012	1.50	-0-
Astor Park	4/20/2012	1.75	-0-
Howey-in-the-Hills	7/09/2012	0.75	-0-
South Clermont	3/24/2013	1.00	-0-
Sylvan Shores	4/30/2013	1.00	-0-
Lake Dora	4/30/2013	0.88	-0-
South Clermont	5/19/2013	0.88	-0-
Mount Dora	2/12/2014	1.00	-0-
Groveland	6/10/2014	1.00	-0-
Eustis	6/20/2015	1.00	-0-
Lake Louisa	7/3/2015	1.00	-0-
Lake Dora	3/26/2016	1.00	-0-
Fruitland Park	5/4/2016	0.88	-0-
Sorrento	5/29/2016	1.00	-0-
Leesburg	1/22/2017	1.00	-0-
Tavares	1/22/2017	1.00	-0-
Grand Island	1/22/2017	1.00	-0-
Okahumpka	7/4/2017	0.88	-0-
Mount Plymouth	7/17/2017	1.00	-0-
Paisley	6/28/2018	0.75	-0-
Okahumpka	3/27/2019	1.00	-0-

4. Probability of Future Events

Based on the frequency of hail events in the past, the probability of future hail occurrences in Lake County is high. Over the past 10 years, Lake County has been impacted by one or more hail events per year. It can be expected that future hail events will continue to cause minor to severe damage to property throughout Lake County.

5. Vulnerability and Risk Assessment

As it cannot be predicted where hail may fall, all existing and future buildings, facilities, and populations in Lake County are considered to be equally exposed to this hazard and could potentially be impacted. Hail can become as big as baseballs or golf balls; however, Florida typically experiences hail the size of pennies (0.75-inches) or quarters (1.00-inches). An average hail storm can last for a few minutes to hours. While all of Lake County’s assets are equally exposed to hail, anticipated future damages or losses are expected to be minimal. When looking at the damage amounts associated with historical occurrences, hail generally would have a low impact to Lake County and its jurisdictions.

⁷ <http://www.ncdc.noaa.gov/stormevents>

e) Extreme Heat

1. *Description*

Extreme heat is defined as extended period where the temperature and relative humidity combine for a dangerous heat index. During the summer months heat can be very dangerous, as it can induce hyperthermia (heat stroke), heat exhaustion, or dehydration.

2. *Location and Extent*

All of Lake County is equally at-risk from extreme heat. It is also especially hazardous to certain segments of the population such as the elderly and young children. Additionally, heat increases the demand for electricity to operate air conditioners, increasing the likelihood of brownouts and blackouts within the electrical grid.

While there are various definitions for extreme heat (or heat waves), the National Weather Service issues a heat advisory when the daytime temperatures will exceed a certain temperature depending on the time of the year. It is during these times that those vulnerable populations will be especially prone to extreme heat-related illnesses and conditions. Florida is quite accustomed to daytime temperatures in the 90's in the summertime. Also, with Florida being a peninsula, the breezes from both coastlines assists in keeping the temperatures generally below 100° F. The table below shows the heat threat levels from the National Weather Service.

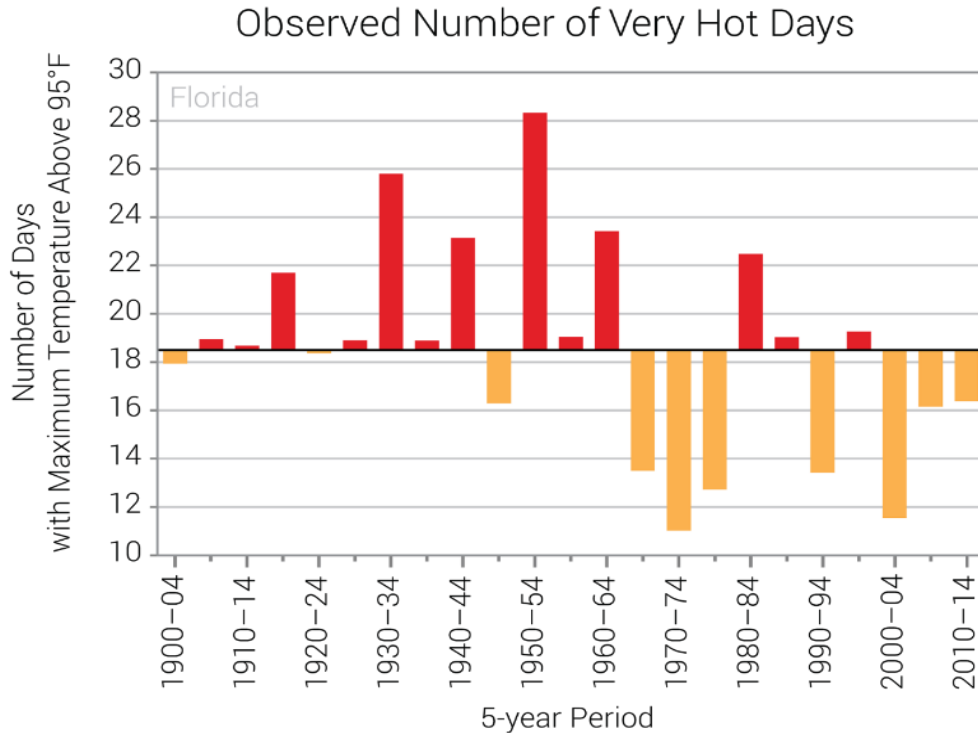
Table 6: Excessive Heat Threat Chart⁸

Excessive Heat Threat Level	Threat Level Descriptions
Extreme	<i>"An Extreme Threat to Life and Property from Excessive Heat"</i> Highest heat index 118 degrees (F) or greater
High	<i>"A High Threat to Life and Property from Excessive Heat"</i> Highest heat index 113-117 degrees (F) or greater
Moderate	<i>"A Moderate Threat to Life and Property from Excessive Heat"</i> Highest heat index 108-112 degrees (F) or greater
Low	<i>"A Low Threat to Life and Property from Excessive Heat"</i> Highest heat index 105-107 degrees (F) or greater.
Very Low	<i>"A Very Low Threat to Life and Property from Excessive Heat"</i> Highest heat index around 105 degrees (F) for July and August or...between 102-104 degrees (F) for June through September or...between 99-103 degrees (F) for May through October
Non-Threatening	<i>"No Discernable Threat to Life and Property from Excessive Heat"</i> Warm season weather conditions are non-threatening

⁸ https://www.weather.gov/mlb/heat_threat

Florida typically experiences far fewer days with temperatures exceeding 100°F than most other southern states, it is the most humid state in the nation leading to uncomfortable summers for visitors and local residents. As mentioned, extended periods of extreme heat, especially when combined with high humidity, can result in heat-related illness among vulnerable populations, as well as place excess stress on agricultural production, water supplies, and energy generation.⁹

Figure 4: Observed Number with Maximum Temperature Above 95 Degrees, State of Florida



3. *Previous Occurrences*

Research from past years did not produce data that revealed extraordinary hot spells within Florida. However, a noteworthy period in Central Florida, including all of Lake County, was the heat wave of June – July 1998, when coastal breezes were impeded – allowing temperatures across the region to range between the upper 90’s and 101 degrees. Wildfires became extreme in certain parts of Central Florida (National Weather Service, Melbourne). This time was known as the ‘98 Florida Firestorm.

4. *Probability of Future Events*

Extreme heat has a moderate probability of having a significant impact to Lake County. As noted, each year Florida typically has several days over 95 degrees in which increases the likelihood of an extreme heat event.

⁹ <https://statesummaries.ncics.org/chapter/fl/>

5. *Vulnerability and Risk Assessment*

All areas of Lake County are susceptible to extreme heat. A significant heat wave coinciding with a drought could damage crops creating an economic effect. Additionally, the homeless and elderly populations would have an increased risk of potential hyperthermia (heat stroke), heat exhaustion, or dehydration. Lake County would have to consider opening shelters to accommodate these populations. Tourism would not necessarily be impacted as hot weather is expected in Florida. Critical facilities and infrastructure would not likely be impacted.

According to the U.S. Census Bureau, in 2018 it was estimated that the median age in Lake County was 47.3 and increase from 45.6 in 2010. Additionally, as of 2018, 26.63% of the population in Lake County was aged 65 years or older (an increase from 25.7% in 2010), representing a rather sizable portion of the county that is more vulnerable to extended periods of extreme heat (or heat waves). The county continues to be a destination for retirees and has seen, and will continue to see, its elderly population increase. Also, urbanization will lead to an increase in the “heat island” effect from an increase in impervious surfaces, which only exacerbates extreme heat as a hazard in the future. Considering all of these factors, extreme heat would generally have a moderate impact to Lake County and its jurisdictions.

f) Tropical Cyclone Events

1. *Description*

A hurricane is a tropical cyclone. A tropical cyclone is a rapidly rotating storm system characterized by a low-pressure center, a closed low-level atmospheric circulation, strong winds, and a spiral arrangement of thunderstorms that produce heavy rain or squalls.

Hurricanes and tropical storms have long affected Florida because of its location. As a narrow peninsula between two warm bodies of water, Florida is regularly affected by hurricanes. The greatest threats to Lake County posed by a hurricane are wind damage and inland flooding. Wind damage from the storm itself is related to wind speed and the accompanying “pressure” that is exerted on structures. When the wind speed doubles, four times more force is exerted on structures. Wind damage can also be caused by hurricane-spawned tornadoes, which can be more destructive than the hurricane itself. Damage can also be caused by wind-borne debris and flood conditions.

2. *Location and Extent*

The entire County is susceptible to tropical cyclone events. Over the course of the past century, a very large number of storms have crossed the Central Florida region from various directions. Lake County is no stranger to tropical systems, which can have severe impacts on health, safety, and the economy. Many of the hurricanes identified as crossing through Lake County were during periods when record keeping did not document a storm name or specific information. Sources of historical hurricane information often provide a large amount of information for coastal locations, but less for interior locations.

The intensity of hurricanes is measured by the Saffir-Simpson scale, with sustained wind speeds (measured in miles per hour) to measure the extent of a tropical storm or depression. Once a tropical storm reaches wind speeds of 74 miles per hour or greater, it

is then classified as a Category 1 hurricane. It is important to note that in 2010, the National Weather Service and National Hurricane Center have changed its criteria by no longer correlating wind speed with storm surge height. No two storms are the same and less intense storms could in fact created storm surge that is comparable to stronger storms.

Typical damage by hurricane category can be seen in the following table.

Table 7: Saffir-Simpson Scale and Typical Damage¹⁰

Scale	Wind Speed	Typical Damage
Category 1	74-95 mph	Well-constructed frame homes could have damage to roof, shingles, vinyl siding, and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
Category 2	96-110 mph	Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
Category 3	111-129 mph	Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
Category 4	130-156 mph	Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
Category 5	≥157 mph	A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

3. *Previous Occurrences*

Between 1851 and 2018, in Florida, 112 hurricanes have directly impacted the state of Florida. The total number of major hurricanes, Category 3 or above, between 1851 and 2018, reached 55, resulting in incalculable damages and loss of life. Flooding that occurred from Tropical Storm Fay is discussed in the flooding hazard section and no other significant tropical cyclone hazards have occurred since. The following storms are a few of the more notable events that have impacted Lake County, based on available information:

- Hurricane Donna, 1960: This storm impacted Florida as a Category 4 hurricane and traveled northward through the state, heavily impacting the citrus industry up to the Central Florida region.

¹⁰ <http://www.nhc.noaa.gov/aboutsshws.php>

- Hurricane Charley, 2004: There were some downed trees and power lines in southern Lake County. Three houses were damaged by falling trees. There was no major infrastructure damage (National Weather Service, Melbourne). Orange County and areas to the east of Lake County received substantial damage. This storm is an excellent example of a hurricane that did not lose much potency, despite traveling over land for an extended period of time. The storm exited the state in the Daytona Beach area. If the storm track had been slightly to the west, Lake County could have received substantial damage. The previous LMS notes that Lake County sheltered about 2,000 people during Hurricane Charley.
- Hurricane Frances, 2004: This storm resulted in 417 residences being damaged in Lake County, with 69 destroyed (most mobile homes), 77 business damaged and two (2) destroyed. Damage estimates were near six (6) million dollars (National Weather Service, Melbourne). The previous LMS notes that the damages were higher at approximately \$8.5 million and that Lake County sheltered about 4,000 people during Hurricane Frances.
- Hurricane Jeanne, 2004: The impacts in Lake County were that approximately 2,800 residences were damaged, 111 residences destroyed and 60 businesses damaged (National Weather Service, Melbourne).
- Hurricane Matthew, 2016: As major Hurricane Matthew passed east of the Space Coast during the morning of October 7, winds gusted to tropical storm force for over 12 hours across Lake County. Major damage occurred to three homes with minor damage to four homes, caused mainly by falling trees and branches. Initial property damage assessment was a cost of approximately \$389 thousand.¹¹
- Hurricane Irma, 2017: Category 3 Hurricane Irma made landfall near Naples during the late afternoon of September 10. Irma then moved northward across west-central Florida during the overnight period while weakening to a Category 1 hurricane approximately 45 miles west of Leesburg. A long duration of damaging winds occurred across Lake County, with a period of gusts to minimal hurricane force. The highest measured sustained wind was recorded at the Leesburg Airport ASOS (KLEE; 48 mph from the southeast at 0235LST on September 11) and the highest measured peak gust was 69 mph from the southeast at 0246LST. A preliminary damage assessment from the county listed 1,987 affected residential and business structures, with an additional 648 with minor damage, 82 with major damage and 7 destroyed. The total residential/business estimated damage cost was \$36.5 million.¹²

¹¹ <https://www.ncdc.noaa.gov/stormevents/eventdetails.jsp?id=719429>

¹² <https://www.ncdc.noaa.gov/stormevents/eventdetails.jsp?id=719501>

impacted the residents and businesses of Lake County. With the population of Lake County continuing to grow, the effects of even minor hurricanes and tropical systems will be felt even more than in the past. Storms from the past, like Hurricane Donna, while costly, were not in today's dollars and did not impact nearly as many people than if the storm hit today. Storms like Hurricane Charley, which hit the Orlando metro area with sustained winds of 85 mph, remind public safety officials that predictions are not always accurate. Despite being an interior county, substantial damage can be done away from the coastline. Furthermore, a slight change in path can make all of the difference in the areas that are ultimately impacted by an event. Through the efforts of mitigation activities, areas can be further protected against known hazards.

The entire population of Lake County, tourism, agriculture, critical facilities, and infrastructure could be affected by a tropical cyclone depending on the severity of the storm and the path it takes. Mobile homes, poorly constructed and/or substandard housing, apartment complexes, and low-rent housing projects are especially susceptible because of their lack of resistance to high winds, and apartment complexes and low-rent projects because of their size and densities. High wind speeds can cause damage to structures with the most significant threat to mobile homes and other older substandard or unreinforced properties that are located throughout the County.

The total mobile home population in Lake County is estimated at 40,935¹⁴ accounting for nearly 12% of the total county population. This population has to have a safe place to go during possible tornadic activity.

While everyone can be impacted, the elderly, those with lower income, and the homeless would be most affected. Tornadoes can cause other cascading events like utility outages, economic loss, and transportation issues along with the hardships that result from the disruption of normal life. Thus, when considering the possibility of these wide-ranging effects, the impact to Lake County and its jurisdictions is high.

While improbable, it is not impossible for a Category 5 hurricane, with winds of 155 MPH, to impact Lake County, however, due to inland location the predominant number of storms would be Category 4 or less.

g) Thunderstorms/Wind/Lightning

1. *Description*

Thunderstorms consist of rain-bearing clouds that also produces lightning, a rapid discharge of electricity in the atmosphere. Any person who has been a resident of Central Florida during the summer is well aware of the typical weather patterns during this season. Warm mornings give way to afternoon thunderstorms that are typically localized and can be very intense. Compared to many other places in the nation, Central and South Florida receive an exorbitant amount of lightning strikes that are responsible for numerous deaths and property damage every year. The Central Florida region between Tampa and Orlando

¹⁴ data.census.gov; 2018 ACS 1-Year Estimates: Total Pop. in Occupied Housing by Tenure by Units in Structure

has been dubbed the “Lightning Capital” of the United States. Here, warm, rising air pulls in sea breezes from the Atlantic Ocean and the Gulf of Mexico.

2. *Location and Extent*

All areas of Lake County are susceptible to the effects of thunderstorms. These events are common throughout Florida, occur throughout the year and typically are widespread events. Although thunderstorms generally affect a small area, they are very dangerous given their ability to produce accompanying hazards including high winds, hail, and lightning which all may cause serious injury or death, in addition to property damage. They are most common in Florida because atmospheric conditions are favorable for generating powerful storms.

All areas of Lake County are susceptible to the effects of high winds related to a thunderstorm. A severe thunderstorm includes damaging winds greater than 58 mph (50 knots) or greater and hail 1 inch or larger in diameter. High winds have been further broken down into three categories by the NWS Storm Events database:

- High Wind: Sustained non-convective winds of 35 knots (40 mph) or greater lasting for 1 hour or longer or winds (sustained or gusts) of 50 knots (58 mph) for any duration (or otherwise locally/regionally defined), on a widespread or localized basis. In some mountainous areas, the above numerical values are 43 knots (50 mph) and 65 knots (75 mph), respectively.
- Strong Wind: Non-convective winds gusting less than 50 knots (58 mph), or sustained winds less than 35 knots (40 mph) resulting in a fatality, injury, or damage.
- Thunderstorm Wind: Winds, arising from convection (occurring within 30 minutes of lightning being observed or detected), with speeds of at least 50 knots (58 mph), or winds of any speed (non-severe thunderstorm winds below 50 knots) producing a fatality, injury, or damage. Events with maximum sustained winds or wind gusts less than 50 knots (58 mph) should be entered as a Storm Data event only if they result in fatalities, injuries, or serious property damage.

All areas of Lake County are susceptible to lightning strikes and their potential effects. Any lightning bolt can kill. Lightning plays a crucial role in the fire-based ecologies of the forests; unfortunately, it also plays a role in fires that might threaten human life and property. Many of the fires in 1998¹⁵ that impacted the State of Florida were ignited by lightning strikes. Due to Lake County’s location in Central Florida, there are a large number of lightning strikes and loss of life can primarily be prevented by proper public education. Damage to buildings can also be prevented by lightning rod systems and surge protectors to reduce the risk of fires. With regard to a scale for lightning, there is no scale for strength (such as weak vs. strong).

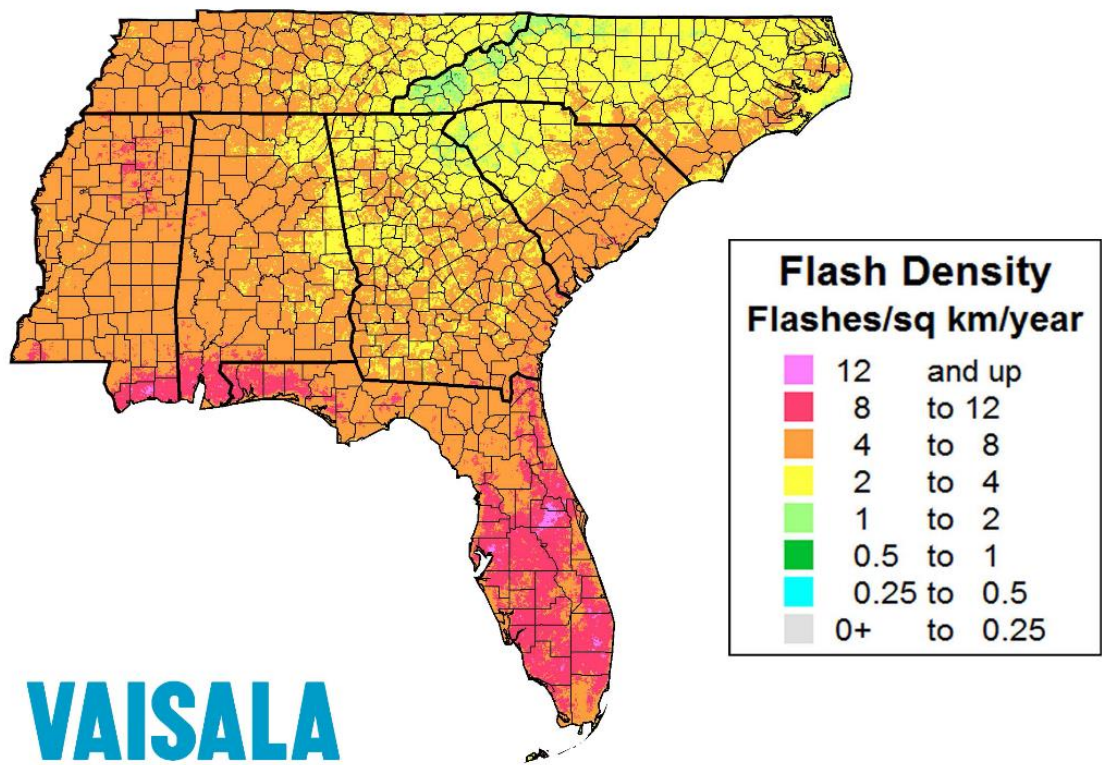
3. *Previous Occurrences*

Within Lake County, 13 deaths and 39 injuries occurred between 1959 and 2010, with a total of 449 deaths statewide in the same period. This included a man who was struck and

¹⁵ U.S. Fire Administration, 2004

killed in June 1990 while on a golf course in Lake County, and a fourth-grade teacher at Eustis Heights Elementary School who was struck and injured in 1988 while standing in an exterior doorway. Since 2010, forty-three¹⁶ (43) people have died in Florida from lightning strikes, an average of 3+ people per year, while some 25+ people are injured on average in the United States. Lake County could expect 4-12 lightning flashes per square kilometer per year. In 2018, lightning struck and killed a 44-year old man in Umatilla, this has been the only death recorded in the county due to lightning since 2010. The Figure below indicates lightning flash density from 2007 through 2016.

National Lightning Detection Network 2007 - 2016



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Figure 6: Vaisala National Lightning Detection Network (2007 - 2016)¹⁷

Since 2010, there have been 29 thunderstorm/wind events in the county, 13 of which caused damage in Lake County. Details of these impacts, including the magnitude and amount of property damage cost are listed in the following table.

¹⁶ <http://www.lightningsafety.noaa.gov/victims.html>

¹⁷ Lightning data from Vaisala.com provided in a media release dated 2017

Table 8: Thunderstorm/Wind Events in Lake County (2010 – 2019)¹⁸

Location	Date	Magnitude	Property Damage
<i>Mascotte</i>	1/25/2011	61 kts EG	500.00K
<i>Ferndale</i>	1/25/2011	56 kts EG	20.00K
<i>Mascotte</i>	3/30/2011	50 kts EG	0.00K
<i>Grand Island</i>	3/30/2011	50 kts EG	0.00K
<i>Leesburg Airport</i>	3/30/2011	54 kts EG	0.00K
<i>Tavares</i>	3/30/2011	50 kts EG	0.00K
<i>Astor Park</i>	4/20/2012	52 kts EG	0.50K
<i>Groveland</i>	5/15/2012	50 kts EG	0.40K
<i>Lady Lake</i>	8/10/2012	50 kts EG	0.00K
<i>South Clermont</i>	3/24/2013	56 kts EG	0.00K
<i>Lake Louisa</i>	3/24/2013	70 kts EG	250.00K
<i>Lake Louisa</i>	3/24/2013	65 kts EG	0.00K
<i>Mt. Dora</i>	6/11/2013	Heavy Rain	10.00K
<i>Lake Griffin</i>	7/4/2013	50 kts EG	0.00K
<i>Minneola</i>	4/30/2014	43 kts EG	2.00K
<i>Tavares</i>	6/10/2014	48 kts EG	1.00K
<i>Mt. Dora</i>	5/20/2015	52 kts. EG	0.00K
<i>Montverde</i>	6/1/2015	52 kts. EG	0.00K
<i>Ferndale</i>	6/18/2015	52 kts. EG	0.00K
<i>Lane Park</i>	6/25/2015	52 kts. EG	0.00K
<i>Tavares</i>	7/29/2015	48 kts. EG	50.00K
<i>Montclair</i>	7/29/2015	43 kts. EG	1.00K
<i>Lake Dora</i>	3/26/2016	50 kts. EG	0.00K
<i>Sylvan Shores</i>	7/13/2016	52 kts. EG	10.00K
<i>Lake Minnehaha</i>	7/15/2016	56 kts. EG	15.00K
<i>Tropical Shores Manor</i>	8/14/2016	50 kts. EG	0.00K
<i>Lisbon</i>	8/14/2016	50 kts. EG	0.00K
<i>Mascotte</i>	9/1/2016	50 kts. EG	14.00K
<i>Eustis</i>	9/1/2016	50 kts. EG	5.00K
<i>Lady Lake</i>	4/6/2017	60 kts. EG	0.00K
<i>Lake Yale</i>	5/30/2017	50 kts. EG	0.00K
<i>Howey in the Hills</i>	7/21/2017	61 kts. EG	25.00K
<i>Lake Harris</i>	4/15/2018	48 kts. EG	1.00K
<i>Howey in the Hills</i>	11/2/2018	50 kts. EG	0.00K

¹⁸ <http://ncdc.noaa.gov/stormevents>

Location	Date	Magnitude	Property Damage
Lake Harris	12/20/2018	50 kts. EG	0.00K
Mascotte	1/24/2019	83 kts. EG	250.00K
Okahumpka	5/5/2019	52 kts. EG	0.00K
Eustis	5/5/2019	52 kts. EG	0.00K

4. *Probability of Future Events*

The probability of future occurrences of thunderstorms/winds/lightning within Lake County is high as these events occur frequently especially during summer months. Generally speaking, all of Lake County is subject to the effects of Thunderstorms, Wind, or Lightning. It is anticipated since Lake County has experienced lightning storms before, it will likely occur again. Wind events in recent history have averaged from 40 to 70 knots and it is likely that those will occur again as well. The county has certainly experienced high winds and gusts that have impacted the residents and businesses of Lake County.

5. *Vulnerability and Risk Assessment*

Lake County is very susceptible to thunderstorms, high winds, and lightning. With the population of Lake County continuing to grow, the effects of thunderstorms and wind events will be felt even more than in the past and substantial damage can be experienced by residents. With severe thunderstorms and lightning, segments of the population could be negatively affected. Agricultural lands throughout the County and its jurisdictions could suffer damage and economic losses. Individuals in open areas such as golf courses and parks are at risk, as well as those that may be participating in boating or other water activities on the numerous lakes and streams in Lake County. Critical facilities and infrastructure would be possibly impacted in a devastating storm. Lightning can cause fires in the future during dry periods, more so within unincorporated Lake County within forested areas. Lake County is part of lightning capital of the US and on average receives 6.0 to 7.5 lightning flashes per square km, a relatively high flash density during storms. Given all of the factors, thunderstorms, high winds, and lightning generally would have a high impact to Lake County and its jurisdictions.

h) Sinkholes/Subsidence

1. *Description*

According to United States Geological Survey (USGS), a sinkhole is a depression in the ground that has no natural external surface drainage. Basically, this means that when it rains, all of the water stays inside the sinkhole and typically drains into the subsurface. Sinkholes are dramatic because the land usually stays intact for a period of time until the underground spaces just get too big. If there is not enough support for the land above the spaces, then a sudden collapse of the land surface can occur.

Topographically, Florida is part of a large Karst formation that comprises a section of the southeastern portion of the United States. Karst refers to the rock “foundation” that is slowly eaten through by chemical weathering eventually leading to subsidence or sinkholes. In Florida, the rock is generally limestone or gypsum, but it can be other types as well. The Karst terrain is also marked by the numerous caves and underground drainages.

2. *Location and Extent*

According to CDS Business Mapping utilizing the sinkhole database, Lake County is ranked as number 10 on a list of the top sinkhole prone counties in Florida¹⁹ and experiences several sinkholes a year, usually on private property. In cases where sinkholes occur in the public right-of-way, the Lake County Department of Public Works and/or the Florida Department of Transportation are notified to assess the sinkhole activity. Sinkholes impact the community generally by physical destruction. Their extent is generally measured in terms of the diameter of the opening and/or their depth (both usually measured in feet). Any size sinkhole is a threat because they can cause harm to people, vehicles or entire structures, as they succumb to the unstable ground.

Although it might be true that some areas of Central Florida are more prone to sinkholes than others, it must be realized that all areas of Lake County are susceptible to sinkholes and their potential effects. The county as a whole has more sinkhole activity in the central portion of the county, with areas outside of the county to the north and east having much more activity, based on sinkhole reports by the U.S. and Florida Geological Surveys. However, this does not mean that extreme damage cannot occur anywhere; all it takes is one sinkhole to severely impact life and property. Sinkholes can be caused by water ponding; canting of fence posts; collapse of bulkheads; and other hydro-geological factors.

3. *Previous Occurrences*

According to the Florida Department of Environmental Protection there were approximately 100 sinkholes reported to that agency since 1964 (FDEP Sinkhole Database), not including reports from other agencies. This number is probably lower than the actual amount considering that there are numerous sinkholes that are never reported to the authorities. Subsidence occurs because of settling of soil underneath the foundation of structures and typically results in minor, repairable damage. It can, however, in some cases result in the structure being condemned. Below are some of the more notable sinkhole occurrences that have happened in Lake County:

- June 2000: An extended drought was blamed for a sinkhole 20 feet wide that opened in Lake County.
- February 2004: A sinkhole approximately 30 feet in diameter opened up in Clermont, forcing a family to relocate until it could be filled.
- November 2005: A large sinkhole forced a Mascotte family out of their home while it was determined if there was a threat to the structural integrity of the house.
- August 2006: A sinkhole opened in Clermont that was approximately 20 feet in diameter and closed Maridru's Lane.
- September 2007: A large, growing sinkhole forced several families in Clermont to relocate after a neighbor's house was condemned.
- June 2011: A sinkhole swallowed part of a Leesburg store building on East Main Street caused by wet weather after a dry spell causing the ground to become too heavy and collapse.

¹⁹ <http://www.riskmeter.com/RiskMeter/RiskMeter-Announces-Top-Ten-Sinkhole-Prone-Counties.htm>

-
- August 2013: A sinkhole opened up in Clermont at the Summer Bay Resort causing a building to slowly sink and prompting the evacuation of three buildings.
 - August 2015: A sinkhole opened up in Groveland which resulted in a boil water notice for some and no water for those closest to the location of the sinkhole including one school.

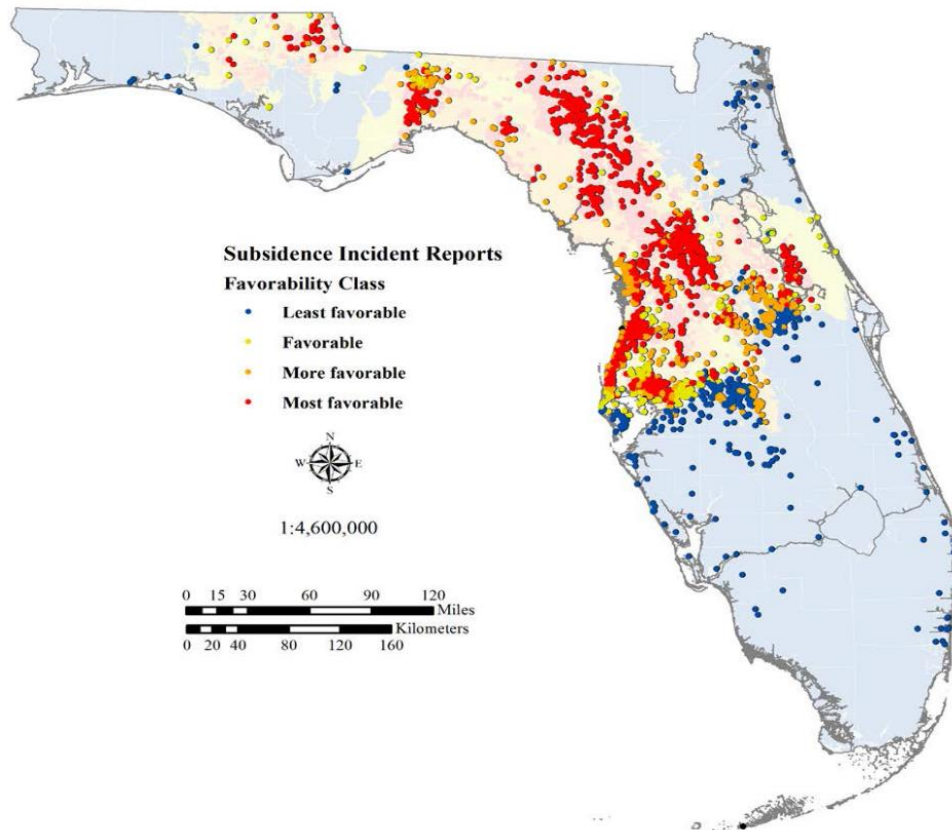
No major sinkhole events have taken place since the last LMS update.

4. *Probability of Future Events*

There is a moderate probability of future sinkhole occurrences in Lake County, according to historic data as sinkhole events occur every few years. Activities that increase the risk of sinkhole are groundwater pumping, construction and development practices, and breakages in water lines, though they can also occur due to natural or geological factors.

5. *Vulnerability and Risk Assessment*

As noted, from 2010 to 2019, Lake County has had a reported 36 sink holes of various sizes, ranging from under 3 feet wide to over 40 feet wide. While most of the sinkholes are relatively minor and pose little threat, there is always the possibility of a much larger sinkhole causing significant damage within the county. A majority of the county is listed as an area that is favorable to sinkhole formation (see the following figure).

Figure 7: 2018 Subsidence Incidents²⁰

Sinkholes can have a diameter of greater than 200 feet. Sinkholes can be shallow or develop depths that are greater than 100 feet, creating extremely dangerous situations, swallowing entire structures. Depending on the location of the sinkhole, residents' homes, tourists in transient housing, critical facilities, infrastructure, and agricultural concerns could suffer negative effects. Economic effects could vary again depending on the size and location of the sinkhole. Considering all of these factors, sinkholes generally have a low impact to Lake County and its jurisdictions.

i) Tornadoes

1. *Description*

A tornado is a violent windstorm characterized by a twisting, funnel-shaped cloud extending to the ground. Tornadoes are most often generated by thunderstorm activity (but sometimes result from hurricanes and other tropical storms) when cool, dry air intersects and overrides a layer of warm, moist air forcing the warm air to rise rapidly.

2. *Location and Extent*

Similar to hurricane data, there is only reliable recorded data for tornadoes since 1950. Although the Midwest has the reputation for the worst tornadoes, Florida experiences the

²⁰ 2018 Subsidence Incident Reports - Florida Division of Emergency Management (FDEM) State Hazard Mitigation Plan

greatest number of tornadoes per square mile of all the states. Florida has averaged 52 tornadoes reported per year since 1961, with an average of two fatalities per year. Florida's tornadoes are generally of shorter duration (3 miles) and have narrower paths (125 yards wide). Mapping indicates that about 95 percent of the county is in the 1 in 250-year risk area, and the remainder in the 1 in 500-year risk area. All areas of Lake County are susceptible to tornadoes and their potential effects.

The Fujita Scale (now the Enhanced Fujita Scale) is used to determine the intensity of tornadoes. Most of the tornadoes that have hit Lake County have been on the lower spectrum, in the F0 or F1 range. On February 1, 2007, the National Weather Service switched from the Fujita Scale to the Enhanced Fujita Scale to better reflect examinations of tornado damage surveys, aligning wind speeds more closely with associated storm damage. The Enhanced Fujita Scale levels are listed in the table below.

Table 9: Measuring the Intensity of Tornadoes (Extent)²¹

Scale	Wind Speed (mph)
EF0	65-85
EF1	86-110
EF2	111-135
EF3	136-165
EF4	166-200
EF5	>200

Because of the unpredictable patterns of tornadoes, and because the entire state of Florida has a relatively high risk, the entire County is vulnerable to tornado-induced damage. The damage potential for a tornado increases as a function of population density. As the number of structures and people increase, the potential damage/injury rate increases. Mobile homes, poorly constructed and/or substandard housing, apartment complexes and low-rent housing projects are especially susceptible because of their lack of resistance to high winds, and apartment complexes and low-rent projects because of their size and densities.

3. *Previous Occurrences*

There have been 51 recorded tornadoes in Lake County since 1950 that have caused somewhere between \$226,470,050 and \$241,320,500 in total damage. These same tornadoes have also been responsible for 231 injuries and 26 deaths.

Historically significant events are noted in the 2010 plan. There have been few significant tornado events in Lake County in the last five years. However, worth noting is a storm that happened in 2007 for the purpose of this plan.

- The Groundhog Day Tornado Outbreak, February 2, 2007: On the morning of February 2, 2007, a powerful storm system moved across Lake County from the

²¹ <http://www.srh.noaa.gov/oun/?n=efscale>

The EF scale still is a set of wind estimates (not measurements) based on damage.

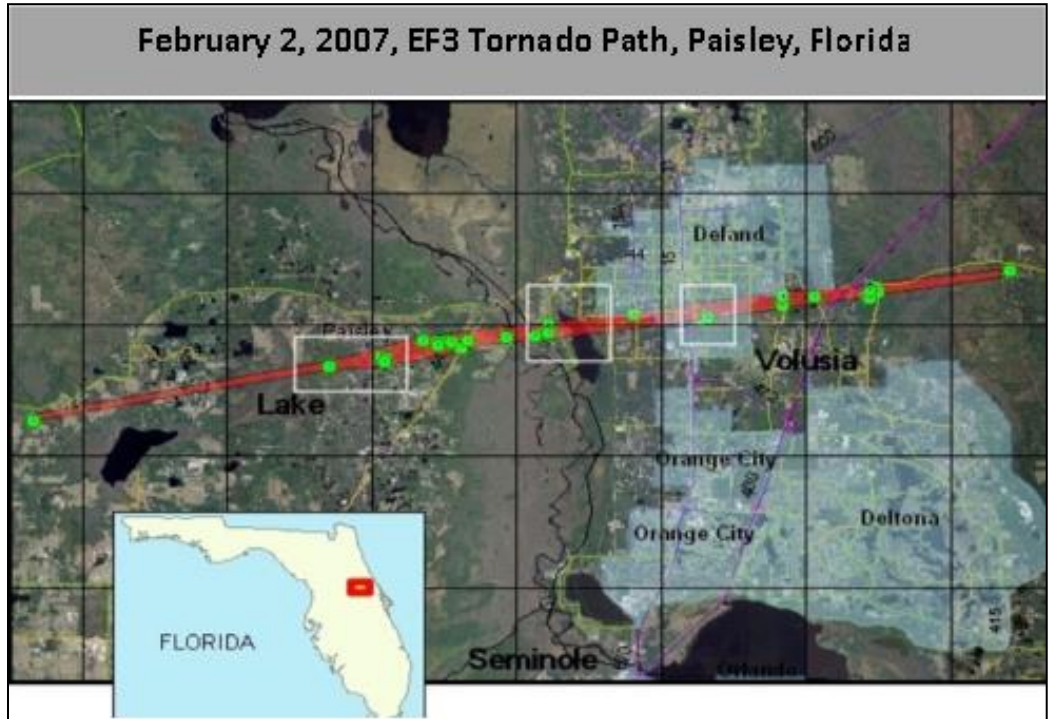
west producing three tornadoes, two of which had large impacts on the County and resulted in a Presidential Disaster Declaration. The first tornado touched down in Sumter County, near Wildwood, and moved toward the Villages and Lady Lake. This tornado registered as an EF3 on the Enhanced Fujita Scale and created a swath of destruction along its 17-mile path, killing eight.

- The second tornado touched down near County Road 42 in northern Lake County in between Altoona and Paisley. This tornado was responsible for 13 deaths as it traveled its 26-mile path. In addition to killing 21 people in Lake County, these tornadoes caused approximately \$98 million in damages. These storms struck in the early morning hours when many people were sleeping and unable to receive emergency messages. The path of these storms is displayed in the following figures.

Figure 8: February 2, 2007, EF3 Tornado Path, Lady Lake, Florida



Figure 9: February 2, 2007, EF3 Tornado Path, Paisley, Florida



The table below lists the incidences of tornadoes in Lake County since 2010.

Table 10: Tornado/Funnel Cloud Events in Lake County (2010 – 2020)²²

Location	Date	Magnitude	Property Damage
<i>Dona Vista</i>	9/12/2010	Funnel Cloud	-0-
<i>Grand Island</i>	8/5/2011	EF0	\$25K
<i>Lady Lake</i>	9/24/2011	Funnel Cloud	-0-
<i>Lake Louisa</i>	6/24/2012	EF0	-0-
<i>Eustis Airport</i>	6/25/2012	Funnel Cloud	-0-
<i>Tropical Shores</i>	4/30/2013	Funnel Cloud	-0-
<i>Mount Plymouth</i>	2/23/2014	Funnel Cloud	-0-
<i>Clermont</i>	6/1/2015	EF0	-0-
<i>Fruitland park</i>	9/1/2016	EF0	\$22K
<i>Emerald</i>	9/13/2016	Funnel Cloud	-0-
<i>Dona vista</i>	1/22/2017	Funnel Cloud	-0-
<i>Umatilla</i>	9/10/2017	EF1	-0-
<i>Tavares</i>	7/4/2018	EF0	-0-
<i>Okahumpka</i>	1/4/2020	EF0	-0-

4. Probability of Future Events

According to previous occurrences the probability of a future tornado affecting Lake County is moderate. While the majority of these events are small in terms of size, intensity and duration, a greater number of stronger storms (i.e., F2 and F3 tornadoes) have been reported in the past. Further, even a minor tornado can cause substantial damage.

5. Vulnerability and Risk Assessment

Due to the unpredictable nature of tornadoes, all of Lake County is vulnerable to their impacts. High wind speeds can cause damage to structures with the most significant threat to mobile homes and other older substandard or unreinforced properties. The total mobile home population in Lake County is estimated at 40,935²³ accounting for nearly 12% of the total county population. The mobile home population is distributed throughout the County and all jurisdictions. This population has to have a safe place to go during possible tornadic activity. While everyone can be impacted, the elderly, those with lower income, and the homeless would be most affected. Tornadoes can cause other cascading events like utility outages, economic loss, and transportation issues along with the hardships that result from the disruption of normal life.

A tornado with the greatest intensity of EF5, with winds of greater than 200 MPH, although rare, could occur in Lake County. The maximum that has occurred has been a recorded

²² <http://ncdc.noaa.gov/stormevents>

²³ data.census.gov; 2018 ACS 1-Year Estimates: Total Pop. in Occupied Housing by Tenure by Units in Structure

EF3 in February, 2007 during the Groundhog Day Outbreak. This incident is considered the worst natural disaster in the county's history and officials were determined not to let it happen again. In February of 2011, Lake County launched a new warning system that calls residents directly when there is a public safety emergency. Alert Lake was the new emergency notification system and for tornado warnings (or other significant incidents, such as natural disasters, warning from law enforcement, chemical spill, flooding, or other emergencies), the system automatically calls people on a registered phone number. For those who have landlines in their homes, the 911 database is utilized. For those that do not have a house phone but want to know about severe weather when on the go, the Alert Lake system can also send messages straight to a cell phone. Considering all of these factors, tornadoes would generally have a moderate impact to Lake County and its jurisdictions.

j) Brush Fires, Wildfires and Forest Fires

1. *Description*

According to the Federal Emergency Management Agency (FEMA), a wildland fire or wildfire is an unplanned, unwanted fire burning in a natural area, such as a forest, grassland, or prairie. As building development expands into these areas, homes and business may be situated in or near areas susceptible to wildfires. This is called the wildland urban interface. Wildfires can damage natural resources, destroy homes, and threaten the safety of the public and the firefighters who protect forests and communities.

2. *Location and Extent*

Lake County is uniformly exposed to wildfire risk. Forest fires pose a serious threat while playing an important role in Florida's ecology. Much of the northeast portion of Lake County lies within the Ocala National Forest, which contains many longleaf pines that are a fire dependent species of tree. It is important to understand that much of the Ocala National Forest is a fire-based ecology, and as such, special precautions should be made by those who reside within it. The "La Nina" weather effect occasionally causes an extended drought period. Controlled burns reduce the amount of fuel that might build up over years of not having a fire. The Florida and US Divisions of Forestry have incorporated controlled, naturally occurring, and prescribed burns into their forest management plans. Uncontrolled wildfires will continue to threaten Lake County and it is important to understand the actions that can take place to reduce the threats posed by wildfires.

Wildland fires can adversely impact homes, businesses, and vegetation, specifically those that are in higher risk areas. And, wildland fires affect visibility as well as air quality, which, can severely affect populations with compromised respiratory systems (such as the elderly). Impacts of wildfires are measured by acres burned each year.

While all areas of Lake County are vulnerable to wildfires, the northeast and southern portions of the county are more likely to experience direct incidents of wildland fires. A wildland fire incident can be felt throughout the county due to resources being redirected to contain the fires.

3. Previous Occurrences

All of Lake County may be impacted by wildfires during the especially months with minimal rainfall. Carelessness can lead to wildfires during dry or windy conditions and when burning restrictions are not followed. Even with prescribed burns, Lake County remains at risk for brush fires in unincorporated areas and at the wildland/urban interface areas. Since 2010, the only published account of a burn ban was ordered in Lake County from February to June 2012. Below is a look at how many acres have burned due to wildfires in Lake County from 2012 to 2019.²⁴

**Table 11: Acres Burned due to Wildfires,
Lake County, FL (2012 – 2019)**

Year	Total Acres Burned
2012	2,008.6
2013	374.5
2014	337.5
2015	674
2016	804
2017	2,941.3
2018	244
2019	64.7

The following highlight a few of the more notable forest fires in Lake County, which are briefly summarized.

- Fires of 1998: Unusually extended periods of hot weather coupled with little rainfall created the ideal situation for an outbreak of forest fires in Central Florida in the summer of 1998 (NOAA). Some 2,200 fires occurred that summer, with most of the damage being caused by a few of the very large ones. All jurisdictions within Lake County were affected to some degree by the prolonged heat and wildfire threat.
- Fire of 1999: The smoke from a large brush fire near Groveland was responsible for 5 accidents on March 3, 1999. Seven people were hospitalized. The jurisdictions affected were unincorporated Lake County and the City of Groveland.
- Fires of 2000: High temperatures and an extended dry period allowed for 13 fires to flare up during the summer of 2000 – burning some 4,000 acres of central and southern Lake County. All jurisdictions within Lake County were affected to some degree by this large-scale fire.
- Green Swamp Fire of 2001: An illegal trash fire started a 10,000-acre blaze that blanketed much of central and south Lake County in smoke. This smoke was responsible for several accidents due to low visibility on U.S. 27, and respiratory problems for at-risk citizens. The primary jurisdictions affected were Groveland, Clermont, Mascotte, Montverde, and unincorporated Lake County.

²⁴ Source: Lake County Fire Rescue – Historical Fire Data, Accessed May 6, 2020

- Wekiva River Fire of 2007: Some 36 residences were evacuated near the Wekiva River after a 1,000-acre fire burned within a quarter mile of the homes in May of 2007. The primary jurisdiction affected was unincorporated Lake County.
- Deerhaven Fire of 2008: Approximately 140 homes near Deerhaven (northeast Lake County) were evacuated after a 1,000-acre blaze threatened to close off a main road to these houses. The Deerhaven Wildfire became out of control after 25 mph wind gusts made it difficult to contain. The primary jurisdiction affected was unincorporated Lake County.
- 2012 Groveland Fires: In January a 300-acre fire on County Road 33 was difficult to contain due to swamp conditions before rain helped firefighters contain the blaze. In February a fire in Clermont shut down Thompson Place near CR 561 as the fire continued to burn in swampy area. In April a fire north of State Road 50 near Timber Lake Village had to be contained before reaching a nearby swamp which could have resulted in a muck fire that lasted for weeks.
- April 2012, Sorrento: An illegal burn in a yard spread quickly and threatened homes.
- April 2016, Eustis Radio Tower Fire: an unattended yard debris fire spread consuming 141 acres threatened homes in the Royal Trails Subdivision.
- April 2017, Sod Farm II. A fire started in Eustis and quickly spread to 400 acres overnight prompting the evacuation of more than 20 homes. By the following day the fire had been contained at 782 acres.

4. *Probability of Future Events*

There is a moderate probability of future wildfire events in Lake County, especially during drought cycles and abnormally dry conditions, particularly during the months with minimal rainfall amounts (December through April). An estimated acreage cannot be determined as the amount of acres burned can vary wildly from year to year.

5. *Vulnerability and Risk Assessment*

The major causes of brush and forest fires are due to lightning, human negligence, or cases of criminal mischief, and occurs during the months with higher thunderstorm activities. Late winter and spring also are prime periods for wildfires, fueled by strong winds and a lack of rainfall during that same time frame. Lake County has a considerable amount of undeveloped area with prime fuel source for fires and experienced major fire events in the past.

In 2019, an assessment identified the following communities in the County to be at the highest risk:

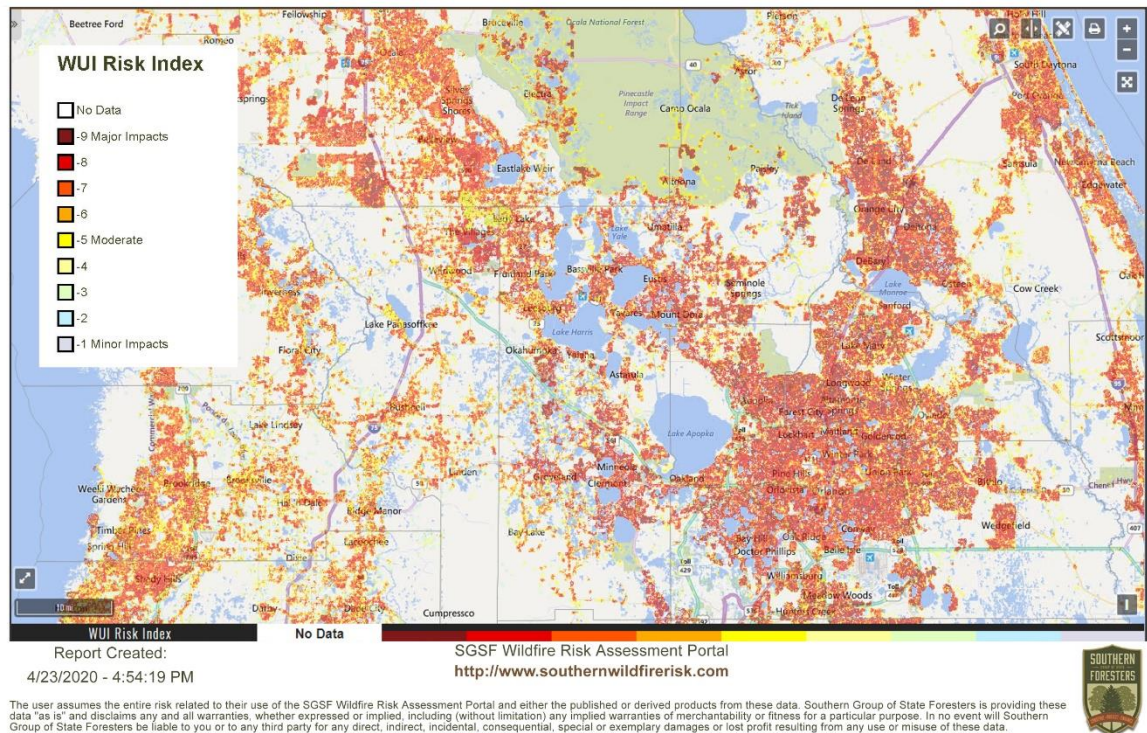
- Cassia
- Green Swamp
- North Lake
- Pine Lakes

- The Royal Trails Subdivision

The Florida Forest Service Wildland Urban Interface (WUI) Risk Index, illustrated in the following figure, identifies areas where the potential impact of wildfire on people and their homes and assess a risk based on housing density and fire intensity (Flame Length) to determine areas that may be majorly impacted by a wildfire incident.²⁵ A map of critical facilities within the WUI risk areas is available in Appendix III: Maps and Figures – Wildland Urban Interface (WUI) Risk Index for Lake County, Florida.

Figure 10: Wildland Urban Interface (WUI) Risk Index

Wildland Urban Interface Risk Index
Lake County, FL



Wildfires in Lake County primarily affect wooded areas with low population density and do not typically pose a danger to highly populated areas. However, wildfires can still impact all jurisdictions in Lake County. Structures, critical facilities, infrastructure, and housing for vulnerable populations have some exposure to impact by wildfires. An exact dollar loss cannot be determined due to the fact impact is undefined. There have been no significant wildfires other than those reflected in this section. Considering all of these factors, wildfires/forest fires would generally have a moderate impact to Lake County and its jurisdictions.

²⁵ <https://www.southernwildfirerisk.com/>

k) Erosion

1. *Description*

Erosion occurs when land is worn away by the action of natural forces in waves, currents and wind. Even though erosion is a natural process, it can be either mitigated or enhanced by human activity. Erosion is generally measured as the loss of material in cubic yards.

2. *Location and Extent*

Erosion is most likely to take place within Lake County along the Wekiva and St. Johns Rivers to the northeast, as well as along streams, creek beds, lakes and other bodies of water that are scattered throughout the County. All residents need to be vigilant about erosion in areas that are adjacent to bodies of water as erosion can result in damage to property, roads, and other infrastructure.

According to the St. Johns River Water Management District, the Florida Legislature passed the Wekiva River Protection Act in 1988 which requires the river's surrounding counties to amend their comprehensive plans and land development rules to deter wetlands losses and protect wildlife habitats. The act authorizes local governments to create rules to treat stormwater runoff. Special rules are also in place for development in the basin that require additional stormwater treatment and established protection zones along the waterways to preserve wetlands, uplands and water quality and reduce erosion and groundwater drawdown.

3. *Previous Occurrences*

Since 2010, there has been one incident of erosion in Clermont. In April 2013, rainfall of 3 to 4 inches in a short period of time, associated with a strong thunderstorm, caused a steep 30-foot section of ground adjacent to State Road 50 in Clermont to slide into a home. The mudslide destroyed a home on Sunnyside Drive. Mud several feet high entered the home. The drainage system in the area was designed several decades ago and could not handle the excessive rain rate. Property damage was estimated at \$75,000.

4. *Probability of Future Events*

Besides the 2010 occurrence, there have been no other documented incidents in Lake County. The probability that an event happens in the county continues to be low.

5. *Vulnerability and Risk Assessment*

Lake County has not seen any large erosion events that have caused widespread damage to property. However, erosion is being addressed along the Wekiva and St. Johns Rivers. Erosion can result in structures adjacent to water bodies becoming damaged or destroyed because they are not able to be supported by the ground. There is no scale to measure the magnitude or severity of erosion, as even small amounts of erosion can lead to substantial damage to homes and businesses. Erosion impacts would be fairly limited in scope as impacts to populations, tourism, agriculture, economic interest, critical facilities and infrastructure have not be realized in the past. Considering all of these factors, erosion would generally have low impact to Lake County and its jurisdictions.

l) Winter Storm/Freeze:

1. *Description*

The National Weather Service (NWS) defines a Winter Storm/Freeze as a weather event with accumulating frozen precipitation such as snow, sleet, and/or freezing rain. This event affects every state in the continental United States, although such weather is typically uncommon in Florida, especially southern parts.

A freeze occurs when overnight temperatures reach at least 32 degrees Fahrenheit. A hard freeze occurs when overnight temperatures fall below 28 degrees Fahrenheit for at least 4 hours.

2. *Location and Extent*

Extremely freezing temperatures are not typical for the Florida climate although each winter, Florida faces the threat of at least a moderate freeze. For Lake County this hazard is a potential problem centered on the vegetable, foliage, and citrus industries. Episodes of extreme freezing temperatures would be widespread to all locations and not just specific locales. If temperatures reach freezing levels for extended periods of time, combined with other climatic factors, crop or landscape damage may occur, having a significant impact on the county’s economy and employment base.

The freeze line runs through the northern part of Lake County just north of Altoona although the entire county could be impacted. Personal injury or death due to freezes is not considered a hazard except for the homeless and indirectly through fire caused by incorrect or careless use of space heaters, etc. However, the elderly may be impacted as well as young children and since it is anticipated that the elderly population will continue to increase, there is a chance that this population could see some impact from winter storms and freezes. Additionally, consumer demand of electricity during periods of very extreme cold weather may overload the electrical grid, which may cause outages and have a significant impact on electrically-dependent critical facilities and persons. Critical facilities, infrastructure, and tourism would likely not be affected by winter storms and freezes.

3. *Previous Occurrences*

One of the most significant freezes took place within Florida in February, 2001, when the president declared a major disaster declaration for Florida to allow funds to reach those individuals impacted by the event. The agricultural industry was severely impacted and resulted in many individuals being out of work. Since 2010, two freeze and one wind chill events occurred in Lake County and none have occurred since. These are outlined in the table below.

Table 12: Freeze and Wind Chill Events Lake County (2010 – 2020)

Location	Date	Type	Crop Damage
Lake	12/14/2010	Frost/Freeze	-0-
Lake	12/14/2010	Cold/Wind Chill	-0-
Lake	12/27/2010	Frost/Freeze	\$1.830M

4. *Probability of Future Events*

All portions of Lake County have been impacted by episodes of freezing temperatures in the past, therefore confirming that the entire county is susceptible and according to previous occurrences the future probability is moderate.

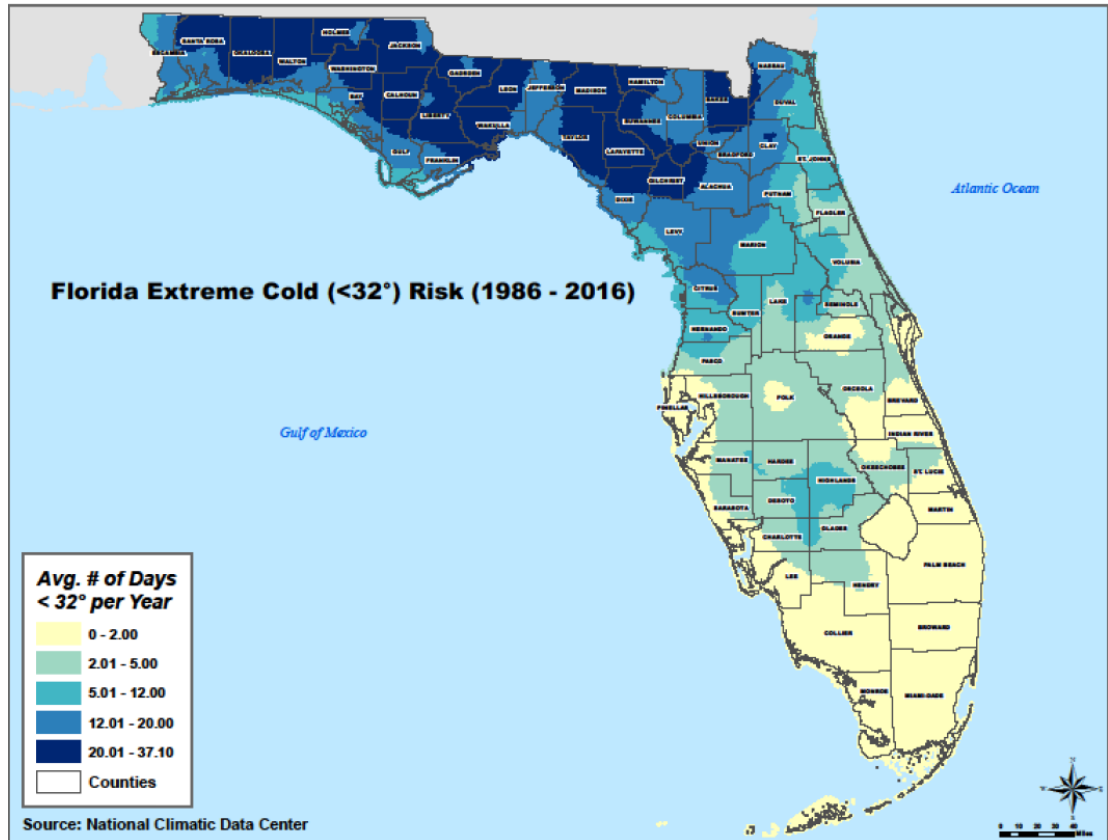
5. *Vulnerability and Risk Assessment*

Temperatures in Lake County can be as low as single digits, but rarely below zero. Additionally, light, freezing rain has been reported on occasion. Frozen precipitation in small amounts, although not commonplace, is possible within Lake County. The probability of another significant freeze event continues to be moderate.

With regard to a scale to measure the magnitude or severity, the National Weather Service issues a threat awareness chart regarding one's vulnerability to the hazard of excessive cold temperatures, especially wind chill. Of the cold weather hazards that can be expected, the most likely for Lake County are the crop-killing freezes. Lake County is not normally subject to the types of winter storms experienced in the panhandle that can include snow precipitation and accumulation; typical effects are from wind, wind chill, and freezes. Considering all of these factors, winter storm/freezes would generally have a low impact to Lake County and its jurisdictions.

According to the National Climactic Data Center, it is expected that the county could see an average of 2 to 12 extreme cold (<32 degrees) days each year (Figure below) is based on the average number of extreme cold days that occurred from the year 1986 through 2016.

Figure 11: Florida Extreme Cold Risk (2000 – 2016)



m) Dam or Levee Failure

1. *Description*

A dam/levee failure is a collapse or breach in a dam or levee. While most dams have storage volumes small enough that failures have little or no repercussions, dams with large storage amounts can cause significant downstream flooding.

According to FEMA, more than a third of the country’s dams are 50 or more years old. Approximately 14,000 of those dams pose a significant hazard to life and property if failure occurs. There are also about 2,000 unsafe dams in the United States, located in almost every state. Dam failures can result from one or a combination of the following reasons²⁶:

- Overtopping caused by floods that exceed the capacity of the dam
- Deliberate acts of sabotage
- Structural failure of materials used in dam construction
- Movement and/or failure of the foundation supporting the dam
- Settlement and cracking of concrete or embankment dams

²⁶ FEMA (2019b). Why Dams Fail, <https://fema.gov/why-dams-fail>

- Piping and internal erosion of soil in embankment dams
- Inadequate maintenance and upkeep

2. *Location and Extent*

According to the Florida Department of Environmental Protection, there are nine (9) dams within Lake County. These dams are located in unincorporated Lake County, but could affect not only jurisdictions within Lake County, but also in other locations in Central Florida.

3. *Previous Occurrences*

To date, there have been no reports of damages as a result of dam failures, however, any issues in the future would likely be as a result of the Burrell Lock and Dam, as well as the Cherry Lake Dam. The Burrell Lock and Dam is located in northwest Lake County north of the City of Leesburg in the vicinity of Lake Griffin. The Cherry Lake Dam is located in southern Lake County, between the Cities of Minneola at Cherry Lake.

Table 13: Dams in Lake County, Florida²⁷

NID ID	Name	Hazard Rating
FL20500	Lake Apopka Lock and Dam	Low
FL00708	Burrell Lock and Dam	High
FL00704	M-1	Low
FL00707	M-6A	Low
FL00437	Cherry Lake Outlet	Significant
FL20503	M-4	Significant
FL20502	M-5	Significant
FL20501	Villa City	Significant
FL20505	Harris Bayou	High

4. *Probability of Future Events*

According to Mr. Ron Hart of the Lake County Water Authority²⁸:

- “The Burrell Dam has the capacity to cause damages to the low-lying property both downstream of the structure as well as around Lake Griffin, especially if discharges out Moss Bluff are not adjusted to accommodate the increases in flow. However, if discharges are managed properly at the Moss Bluff Dam, damages should be limited to low lying areas around Haynes Creek.
- The Cherry Lake Dam can cause damage downstream due to prolonged and excessive discharges that result in the capacity being exceeded at any of the five dams downstream. The dam has a very long levee system that increases the exposure to catastrophic damage and uncontrolled discharges.”

²⁷ National Inventory of Dams (<https://nid.sec.usace.army.mil/>)

²⁸ Lake County LMS 2010

5. *Vulnerability and Risk Assessment*

No evaluations or studies have been conducted to determine the extent of damage that might be caused in the event of a failure. It has been determined, however, that the total amount of damages might exceed the cost to repair or replace these dams. Most of the areas impacted would be residential homes with local roadways and lift stations may be impacted causing issues. Specific areas of concern include the following however the impact is limited and isolated in focus:

- Timber Village/Groveland – Residential mobile home community of approximately 50 homes that may become flooded or have limited access.
- Isolated homes along levees that number less than five homes.
- Pasture flooding in an isolated area with no structures involved.
- Homes at the end of Indigo Road which will have limited access and number approximately 15.
- Plantation Golf Course has 3 to 4 holes that would be underway. This was known when the property was developed and golfers can bypass the area to finish playing. The golf course is responsible for repairing any damages.
- Emerald Lake Subdivision – Extremely low elevation of roads and home sites within the subdivision.

Considering all of these factors, a dam or levee failure would generally have a low impact to Lake County and its jurisdictions.

n) Epidemic/Pandemic

1. *Description*

An epidemic is a disease that affects a greater number of people than is usual within a region. A pandemic is the same as an epidemic except it has spread to more than one region of the world. Infectious diseases are caused by pathogenic microorganisms, such as bacteria, viruses, parasites or fungi; the diseases can be spread, directly or indirectly, from one person to another. Zoonotic diseases are infectious diseases of animals that can cause disease when transmitted to humans.

For the purpose of this Plan, infectious disease has been categorized as (1) pandemic and (2) localized infectious disease outbreaks.

A pandemic is an epidemic that occurs over a wide geographic area, often global. Pandemics results when a microorganism (or disease condition) emerges that is pathogenic for humans but to which humans have no immunity or prior protection. Thus, an epidemic occurs and the number of cases substantially exceeds the number of expected cases over a given period of time. Pandemics generally refer to infectious diseases that spread efficiently from person to person across the globe, although the term may be used to describe medical conditions with other risk factors, such as chronic illnesses like cardiovascular diseases.

2. *Location and Extent*

Populated areas throughout Lake County its jurisdictions are the most at risk from human disease. Disease is not a risk, in itself, to the physical or operational integrity of any type of structure. However, high absenteeism could threaten the operating capabilities of businesses, industries, institutions and government agencies.

In the event of a pandemic, medical and health care facilities may be overwhelmed, with local care not readily accessible to those in need. Fatalities would significantly increase. Public safety would be compromised due to illness among public safety and security agencies. Quarantine and isolation techniques would be imposed, requiring a significant enforcement challenge. Temporary health care facilities and field hospitals would have to be activated and staffed by professionals from outside the county.

Overall, the human and economic consequences of the event would be very substantial.

3. *Previous Occurrences*

- Below are the epidemics/pandemics that may have had notable impacts:
- The “Spanish Flu,” 1918/1919: The Spanish Flu began in August 1918, in three disparate locations: Brest, Boston and Freetown. An unusually severe and deadly strain of influenza spread worldwide. The disease spread across the world, killing 25 million in the course of six months; some estimates put the total of those killed worldwide at well over twice that number. An estimated 17 million died in India, 500,000 in the USA and 200,000 in the UK. It vanished within 18 months and the actual strain was never determined, though some recent attempts at reconstructing genes from the virus have been successful.
- H5N1 “Bird Flu,” 1997/2003: Asian highly pathogenic avian influenza (HPAI) A(H5N1) virus occurs mainly in birds and is highly contagious among them. HPAI Asian H5N1 is especially deadly for poultry. The virus was first detected in 1996 in geese in China. Asian H5N1 was first detected in humans in 1997 during a poultry outbreak in Hong Kong and has since been detected in poultry and wild birds in more than 50 countries in Africa, Asia, Europe, and the Middle East. Six countries are considered to be endemic for Asian HPAI H5N1 virus in poultry (Bangladesh, China, Egypt, India, Indonesia, and Vietnam).²⁹

Since its widespread re-emergence in 2003, rare, sporadic human infections with this virus have been reported in Asia, and later in Africa, Europe, and the Middle East. Human infections with Asian H5N1 viruses have been associated with severe disease and death. Most human infections with avian influenza viruses, including HPAI Asian H5N1 viruses, have occurred after prolonged and close contact with infected birds. Rare human-to-human spread with this virus has occurred, but it has not been sustained and no community spread of this virus has ever been identified.

- SARS, 2002/2003: Severe acute respiratory syndrome (SARS) is a viral respiratory illness caused by a coronavirus called SARS-associated coronavirus

²⁹ <https://www.cdc.gov/flu/avianflu/h5n1-virus.htm>

(SARS-CoV). SARS was first reported in Asia in February 2003. The illness spread to more than two dozen countries in North America, South America, Europe, and Asia before the SARS global outbreak of 2003 was contained.

Since 2004, there have not been any known cases of SARS reported anywhere in the world. The content in this website was developed for the 2003 SARS epidemic. But some guidelines are still being used.³⁰

- H1N1, 2009: In the spring of 2009, a novel influenza A (H1N1) virus emerged. It was detected first in the United States and spread quickly across the United States and the world. This new H1N1 virus contained a unique combination of influenza genes not previously identified in animals or people. This virus was designated as influenza A (H1N1)pdm09 virus. From April 12, 2009 to April 10, 2010, CDC estimated there were 60.8 million cases (range: 43.3-89.3 million), 274,304 hospitalizations (range: 195,086-402,719), and 12,469 deaths (range: 8868-18,306) in the United States due to the (H1N1)pdm09 virus.³¹
- Ebola, 2014-2016: On March 23, 2014, the World Health Organization (WHO) reported cases of Ebola Virus Disease (EVD) in the forested rural region of southeastern Guinea. The identification of these early cases marked the beginning of the West Africa Ebola epidemic, the largest in history. On March 23, 2014, with 49 confirmed cases and 29 deaths, the WHO officially declared an outbreak of EVD.

Overall, eleven people were treated for Ebola in the United States during the 2014-2016 epidemic. On September 30, 2014, CDC confirmed the first travel-associated case of EVD diagnosed in the United States in a man who traveled from West Africa to Dallas, Texas. The patient (the index case) died on October 8, 2014. Two healthcare workers who cared for him in Dallas tested positive for EVD. Both recovered.

On October 23, 2014, a medical aid worker who had volunteered in Guinea was hospitalized in New York City with suspected EVD. The diagnosis was confirmed by the CDC the next day. The patient recovered. Seven other people were cared for in the United States after they were exposed to the virus and became ill while in West Africa, the majority of whom were medical workers. They were transported by chartered aircraft from West Africa to hospitals in the United States. Six of these patients recovered, one died.

- MERS, 2014: In May 2014, CDC confirmed two unlinked imported cases of MERS in the United States—one to Indiana, the other to Florida. Both cases were among healthcare providers who lived and worked in Saudi Arabia. Both traveled to the U.S. from Saudi Arabia, where scientists believe they were infected. Both were hospitalized in the U.S. and later discharged after fully recovering.³²

³⁰ <https://www.cdc.gov/sars/index.html>

³¹ <https://www.cdc.gov/flu/pandemic-resources/2009-h1n1-pandemic.html>

³² <https://www.cdc.gov/coronavirus/mers/us.html>

- Zika Virus, 2015 and 2016: In early 2015, a widespread epidemic of Zika fever, caused by the Zika virus in Brazil, spread to other parts of South and North America. It also affected several islands in the Pacific, and Southeast Asia. In 2016, a reported 5,168 cases of Zika virus were reported in the U.S. In the State of Florida, this included 1,107 cases of the virus.³³
- COVID-19, 2020: On January 11, 2020, Chinese health authorities preliminarily identified more than 40 human infections with novel coronavirus in an outbreak of pneumonia under investigation in Wuhan City, Hubei Province, China. Chinese health authorities subsequently posted the full genome of the so-called “novel coronavirus 2019”, or “2019-nCoV”, in GenBank®, the National Institutes of Health genetic sequence database.

On February 11, 2020 the World Health Organization announced an official name for the disease that is causing the 2019 novel coronavirus outbreak, COVID-19 and declared it a pandemic outbreak on March 11, 2020.³⁴

4. *Probability of Future Events*

According to previous history and the CDC, pandemic type events rarely happen (4 times in the 20th century), therefore indicating a low/moderate probability.

5. *Vulnerability and Risk Assessment*

Certain people are at high-risk for serious complications (infants, elderly, pregnant women, extreme obesity and persons with certain chronic medical conditions). Further impacting risk, most people have little or no immunity because they have no previous exposure to the virus or similar viruses.

Seasonal flu rates of medical visits, complications, hospitalizations and death can vary from low to high. The CDC estimates that flu-related hospitalizations since 2010 ranged from 140,000 to 710,000, while flu-related deaths are estimated to have ranged from 12,000 to 56,000. Now in comparison, pandemic flu rates of medical visits, complications, hospitalizations and death can range from moderate to high. The number of deaths could be much higher than the seasonal flu (e.g. The estimated U.S. death toll during the 1918 pandemic was approximately 675,000). With the recent spread of COVID19, additional pandemic numbers will continually change until a time in which the virus is contained.

Considering the spread and infection rate, a pandemic event may cause major impacts on the general public, such as travel restrictions and school or business closings. Additionally, there is the potential for severe impact on domestic and world economies.³⁵ Thus, a pandemic/epidemic would generally have a high impact to Lake County and its jurisdictions.

Most efforts in analyzing the impacts and effects of disease and pandemic have been done at the national level. Because of the dynamics involved with the spread of disease and pandemic, a local level assessment has not been conducted specifically, but the local

³³ <https://www.cdc.gov/zika/index.html>

³⁴ Florida Department of Health – [Novel Coronavirus \(2019nCoV\)](#)

³⁵ (<https://www.cdc.gov/flu/pandemic-resources/basics/about.html>)

understanding that if a pandemic does impact our community, it will quickly overwhelm our local healthcare system.

o) Hazardous Materials

1. *Description*

A hazardous material is any item or agent which has the potential to cause harm to humans, animals, or the environment, either by itself or through interaction with other factors. Emergencies can happen during production, storage, transportation, use or disposal. Populations are at risk when chemicals are used unsafely or released in harmful amounts where you live, work or play.

Hazardous materials include:

- Explosives;
- Flammable, non-flammable, and poison gas;
- Flammable liquids;
- Flammable, spontaneously combustible, and dangerous when wet solids;
- Oxidizers and organic peroxides;
- Poisons and infectious substances;
- Radioactive materials; and
- Corrosive materials.³⁶

2. *Location and Extent*

The release of a hazardous material to the environment could cause a multitude of problems. Although these incidents can happen almost anywhere, certain areas of the County are at higher risk, such as near roadways that are frequently used for transporting hazardous materials and locations with industrial facilities that use, store, or dispose of such materials. Areas crossed by railways, waterways, airways, and pipelines also have increased potential for mishaps. Incidents can occur during production, storage, transportation, use, or disposal of hazardous materials. Communities can be at risk if a chemical is used unsafely or released in harmful amounts into the environment. Hazardous materials can cause death, serious injury, long-lasting health effects, and damage to buildings, the environment, homes, and other property.

The term “release” includes spilling, leaking, pumping, pouring, emitting, emptying, discharging, escaping, leaching, dumping, or disposing into the environment of any hazardous material. Hazardous material releases (HMRs) may be intentional or accidental, and may occur at fixed facilities or on vehicles.

HMRs are harmful in three ways:

- 1) Life safety concerns. Chemical, biological, and radiological agents can cause significant health risks to those exposed to them; biological agents can be additionally dangerous if they are infectious. Flammable and explosive materials also present life safety concerns if they are exposed to heat.

³⁶ National Archives and Records Administration, “[Code of Federal Regulations Title 49: Transportation](#)”

2) Costly and delicate nature of cleanup. Any release of a hazardous material requires a thorough and careful clean-up of the site and decontamination of those exposed.

3) Operational delays. Delays caused by any HMR and the ensuing evacuation and cleanup processes could lead to significant economic losses due to traffic delays (mobile releases) or operational shut-down (fixed facilities).

Most incidents occur with little or no warning, and can be difficult to detect until symptoms present themselves in those affected. Although major chemical incidents seem most threatening, it is the smaller, more routine accidents and spills that have a greater impact on humans, wildlife, economy, and environment. Some of the most common spills involve tanker trucks and railroad tankers containing gasoline, chlorine, or other industrial chemicals.

Accidental hazardous waste/materials spills can be reported immediately following the spill, thus reducing the amount of time the spill is left uncontained. Most hazardous waste/materials spills occur with little or no warning, and can be difficult, if not impossible, to detect until symptoms present themselves to those affected. External releases may create airborne plumes of chemical, biological, or radiological elements that can affect a wide area and last for hours or days. Internal releases would most likely require evacuation of a facility for hours to days. Both external and internal releases would require extensive clean-up efforts, which could last days to months depending on the type and magnitude of the spill.

3. *Previous Occurrences*

Small hazardous material releases such as gasoline or diesel spills can be a daily/weekly occurrence. The most recent large hazardous materials incident was in July of 2013. A massive explosion at the Blue Rhino Propane Plant resulted in the release of nearly 600,000 pounds of propane.³⁷

4. *Probability of Future Events*

The threat of future incidents involving hazardous materials is ever increasing, not only from our own County's growth and increasing demand for hazardous products, but also from homeland security threats. The County also is a major transportation route where by hazardous materials are constantly traveling through the community in the immediate proximity of citizens, homes, and local businesses. Transportation of hazardous materials via highways, airport, railways, waterways, or pipelines requires citizens to live within vulnerable areas of hazardous materials. Although, the probability and risk of a hazardous material event happening in the future certainly exists, the overall risk remains low due to stringent industry regulation and scrutiny of such facilities and transports.

To assist in planning for potential hazardous materials incidents, the County uses CAMEO FM, a system of software applications used widely to plan for and respond to chemical emergencies. The CAMEO program identifies each facility and creates a worst-case scenario vulnerable zone (VZ) around that facility to help in the planning process to understand all the areas that could potentially be impacted by a chemical release or

³⁷ <https://www.osha.gov/news/newsreleases/region4/12082015>

accident. In an effort to define the hazard areas for our extremely hazardous materials (classified as “302” hazards), we use the output of “worst-case scenarios” from the CAMEO FM Program. When identifying the worst-case vulnerability zones for all the “302” facilities in the County, all of the heavily populated areas are at risk from at least one of the “302” facilities.

5. *Vulnerability and Risk Assessment*

Areas with multiple chemical facilities experience a greater risk of a chemical incident than other locations. Nearly every community in Lake County has at least one facility in each that stores, produces, or utilizes a hazardous material. Propane installations are located across the state and their presence increases the risk of an incident. Hazardous material shipments move through the county annually; these shipments can occur at any time, day or night, and by means of road, rail, air and water, and often through areas with urbanized, high traffic volume routes. Considering all of these factors, a hazardous materials incident would generally have a high impact to Lake County and its jurisdictions.

Hazardous waste/materials spills may be accidental or intentional, and may occur at fixed facilities or during transportation.

Hazardous materials are widely used in public and private facilities and farms. Numerous facilities in Lake County store, use, dispose, or have the capacity and infrastructure to handle hazardous materials on a regular basis; under Title III of the Emergency Planning and Community Right to Know Act, facilities that meet certain requirements must report to federal, state, and local authorities. These facilities are commonly referred to as “Tier I” or “Tier II” facilities. There are 247 Tier II facilities with over 500 hazardous materials located in Lake County.

While smaller spills may be more frequent in Lake County, larger, more dangerous spills are infrequent.

p) Civil Disorder/Disturbance

1. *Description*

Civil disorder is typically the result of groups or individuals within the population feeling, rightly or wrongly, that their needs or rights are not being met, either by the society at large, a segment thereof, or the current overriding political system. When this results in community disruption where intervention is required to maintain public safety it becomes a civil disturbance. Civil disturbances can also occur in reaction to political movements or special events that attract large crowds, or as a result of an unemployment or economic crisis. When groups or individuals disrupt the community to the point where intervention is required to maintain public safety, the event has become a civil disturbance.

2. *Location and Extent*

Civil disturbance can occur anywhere and spans a wide variety of actions which includes, but is not limited to: labor unrest, strikes, civil disobedience, demonstrations, riots, prison riots, or rebellion leading to revolution. Triggers could include racial tension, religious conflict, unemployment, a decrease in normally accepted services or goods, such as extreme water, food, or gasoline rationing, or unpopular political actions. The most common type of civil disturbance is riots. Riots can cause extensive social disruption, loss

of jobs, death, and property damage. The loss and damages may result from those involved in the action or initiated by authorities in response to the perception of a potential threat.

3. *Previous Occurrences*

Lake County has a low occurrence of civil unrest. Lake County contains one State Correctional Institute in Clermont (1,093 population) and the Lake County Detention Center (capacity 960 beds, 747 average population in 2016). In the event of an institutional emergency within the correctional facilities located in Lake County, coordination with State and/or Federal authorities may be required.³⁸

There have been no recorded instances of large, unlawful civil disturbances in Lake County that have exceeded the ability of existing law enforcement resources and partnering agencies to suppress and control.

4. *Probability of Future Events*

The probability of civil disturbances occurring in Lake County is considered low.

5. *Vulnerability and Risk Assessment*

It is impossible to conduct a vulnerability analysis and loss estimation by jurisdiction for Civil Disturbances. While peaceful protests or demonstrations occur frequently, it is difficult to determine when a protest will become a civil disturbance or riot, by disrupting daily operations or by becoming violent. Based on the historical occurrences, the large, urban areas of the state are more likely to be affected by Civil Disturbances than the small rural areas. Considering all of these factors, civil disorder/disturbance would generally have a low impact to Lake County and its jurisdictions.

q) Cyberattack/Cyberterrorism

1. *Description*

For the purposes of this report, a cyberattack is defined as a malicious computer-to-computer attack through cyberspace that undermines the confidentiality, integrity, or availability of a computer (or network), data on that computer, or processes and systems controlled by that computer. National Security Presidential Directive 54/Homeland Security Presidential Directive 23 (NSPD-54/HSPD-23) defines cyberspace as the interdependent network of information technology infrastructures, and includes the Internet, telecommunications networks, computer systems, and embedded processors and controllers in critical industries.

Threats to cyber space are regarded as one of the most serious economic and national security challenges in this day in age for the United States. As the Director of National Intelligence (DNI) recently testified before Congress, “the growing connectivity between information systems, the Internet, and other infrastructures creates opportunities for attackers to disrupt telecommunications, electrical power, energy pipelines, refineries, financial networks, and other critical infrastructures.”³⁹

³⁸ Lake County Comprehensive Emergency Management Plan, 2018

³⁹ Director of National Intelligence, Annual Threat Assessment of the Intelligence Community for the Senate Armed Services Committee, Statement for the Record, March 10, 2009, at 39.

The duration of a cyberattack is dependent on the complexity of the attack, how widespread it is, how quickly the attack is detected, and the resources available to aid in restoring the system. One of the difficulties of malicious cyber activity is that it could come from virtually anyone, virtually anywhere. The following tables summarize the common types and sources of cyberthreats.⁴⁰

⁴⁰ United States Government Accountability Office, "Critical Infrastructure Protection: Department of Homeland Security Faces Challenges in Fulfilling Cybersecurity Responsibilities", Report #GAO-05-434 (May 2005), www.gao.gov/new.items/d05434.pdf

Table 14: Common Types of Cyber Attacks

Type of Attack	Description
<i>Botnet</i>	A collection of compromised machines (bots) under (unified) control of an attacker (botmaster).
<i>Denial of service</i>	A method of attack from a single source that denies system access to legitimate users by overwhelming the target computer with messages and blocking legitimate traffic. It can prevent a system from being able to exchange data with other systems or use the Internet.
<i>Distributed denial of service</i>	A variant of the denial of service attack that uses a coordinated attack from a distributed system of computers rather than from a single source. It often makes use of worms to spread to multiple computers that can then attack the target.
<i>Exploit tools</i>	Publicly available and sophisticated tools that intruders of various skill levels can use to determine vulnerabilities and gain entry into targeted systems.
<i>Logic bombs</i>	A form of sabotage in which a programmer inserts code that causes the program to perform a destructive action when some triggering event occurs, such as terminating the programmer's employment.
<i>Phishing</i>	The creation and use of emails and websites designed to look like those of well-known legitimate businesses, financial institutions, and government agencies in order to deceive Internet users into disclosing their personal data, such as bank and financial account information and passwords. Phishers use or sell this information for criminal purposes, such as identity theft and fraud.
<i>Sniffer</i>	Also known as packet sniffer. A program that intercepts routed data and examines each packet in search of specified information, such as passwords transmitted in clear text.
<i>Trojan horse</i>	A computer program that conceals harmful code. A Trojan horse usually masquerades as a useful program that a user would wish to execute.
<i>Virus</i>	A program that infects computer files, usually executable programs, by inserting a copy of itself into the file. These copies are usually executed when the infected file is loaded into memory, allowing the virus to infect other files. Unlike the computer worm, a virus requires human involvement (usually unwitting) to propagate.
<i>War dialing</i>	Simple programs that dial consecutive telephone numbers looking for modems.
<i>War driving</i>	A method of gaining entry into wireless computer networks using a laptop, antennas, and a wireless network adaptor that involves patrolling locations to gain unauthorized access.
<i>Worm</i>	An independent computer program that reproduces by copying itself from one system to another across a network. Unlike computer viruses, worms do not require human involvement to propagate.

Table 15: Common Sources of Cybersecurity Threats

Threat	Description
<i>Bot-network operators</i>	Bot-network operators are hackers; however, instead of breaking into systems for the challenge or bragging rights, they take over multiple systems in order to coordinate attacks and to distribute phishing schemes, spam, and malware attacks. The services of these networks are sometimes made available on underground markets (e.g., purchasing a denial-of-service attack, servers to relay spam or phishing attacks, etc.).
<i>Criminal groups</i>	Criminal groups seek to attack systems for monetary gain; specifically, organized crime groups use spam, phishing, and spyware/malware to commit identity theft and online fraud. International corporate spies and organized crime organizations also pose a threat to the United States through their ability to conduct industrial espionage and large-scale monetary theft, and to hire or develop hacker talent.
<i>Foreign intelligence services</i>	Foreign intelligence services use cyber tools as part of their information-gathering and espionage activities; in addition, several nations are aggressively working to develop information warfare doctrine, programs, and capabilities. Such capabilities enable a single entity to have a significant and serious impact by disrupting the supply, communications, and economic infrastructures that support military power—impacts that could affect the daily lives of U.S. citizens across the country.
<i>Hackers</i>	Hackers break into networks for the thrill of the challenge or for bragging rights in the hacker community. While remote hacking once required a fair amount of skill or computer knowledge, hackers can now download attack scripts and protocols from the Internet and launch them against victim sites. Thus, while attack tools have become more sophisticated, they have also become easier to use. According to the Central Intelligence Agency, the large majority of hackers do not have the requisite expertise to threaten difficult targets such as critical U.S. networks; nevertheless, the worldwide population of hackers poses a relatively high threat of an isolated or brief disruption causing serious damage.
<i>Insiders</i>	The disgruntled organization insider is a principal source of computer crime. Insiders may not need a great deal of knowledge about computer intrusions because their knowledge of a target system often allows them to gain unrestricted access to cause damage to the system or to steal system data. The insider threat also includes outsourcing vendors as well as employees who accidentally introduce malware into systems.
<i>Phishers</i>	Individuals or small groups that execute phishing schemes in an attempt to steal identities or information for monetary gain. Phishers may also use spam and spyware/malware to accomplish their objectives.
<i>Spammers</i>	Individuals or organizations that distribute unsolicited email with hidden or false information in order to sell products, conduct phishing schemes, distribute spyware/malware, or attack organizations (e.g., denial of service).
<i>Spyware/ Malware authors</i>	Individuals or organizations with malicious intent carry out attacks against users by producing and distributing spyware and malware. Several destructive computer viruses and worms have harmed files and hard drives, including the Melissa Macro Virus, the Explore.Zip worm, the CIH (Chernobyl) Virus, Nimda, Code Red, Slammer, and Blaster.
<i>Cyberterrorists</i>	Cyberterrorists seek to destroy, incapacitate, or exploit critical infrastructures in order to threaten national security; cause mass casualties, weaken economies, or target businesses; and/or damage public morale and confidence. Cyberterrorists may use phishing schemes or spyware/malware in order to generate funds or gather sensitive information.

2. *Location and Extent*

As most day-to-day activities rely on the Internet in one aspect or another, any person or infrastructure is susceptible to cybersecurity threats. Energy pipelines, specifically U.S. natural gas pipelines, have been cited by DHS as targets of cyberattack. While information on these attacks is not publicly available knowledge, cyber security officials warn that, with sufficient access, a hacker could “manipulate pressure and other control system settings, potentially reaping explosions and other dangerous conditions.”⁴¹ While cyber risks and threats are mainly thought of as not having specific locations, there are physical sites that would be impacted. Locations at risk could include government agencies, institutions of higher education, medical facilities, and various private sector entities.

3. *Previous Occurrences*

Low-level cyber-attacks occur daily and sometimes hourly on governmental systems. Most of these attacks do not breach the County systems, however, there have been cases of minor breaches.

4. *Probability of Future Events*

Based on the growing sophistication and political climate, there is a high probability of future cyberattack events within Lake County.

5. *Vulnerability and Risk Assessment*

The public is heavily reliant on technology for daily life, including cell phones, handheld devices such as tablets, and computers. Any disruption to this technology caused by a cyberattack would impair the ability for the public to conduct basic activities, such as communications, mobile banking, and work. Property and facilities may become either uninhabitable or unusable as a result of a cyberattack, particularly if their infrastructure is reliant on technology for sustainability.

A significant majority of critical infrastructure systems are in some way tied to technology, oftentimes through virtual operations and supervisory control and data acquisition (SCADA) systems. Therefore, a cyberattack could disable the vast majority of systems which control these pieces of critical infrastructure, as well as traffic control, dispatch, utility, and response systems. Targeted cyberattacks can impact water or wastewater treatment facilities. The disruption of the virtual systems tied to this infrastructure could cause water pollution or contamination and subsequent environmental issues.

Cyberattacks can interfere with emergency response communication and activities. Given that many first responders rely on technology both at operations center and in the field, a cyberattack could impair the ability to communicate. For example, many agencies rely on technology to notify and route responders to the scene of the emergency. More specifically, 911 dispatch centers rely on technology which makes them vulnerable to cyber exploits. Considering all of these factors, cyberattack/cyberterrorism would generally have a high impact to Lake County and its jurisdictions.

⁴¹ Florida State Hazard Mitigation Plan, 2013

r) Terrorism

1. *Description*

A terrorist incident could involve a wide variety of materials or actions, or combinations of materials and actions. These could range from uncomplicated incidents impacting relatively small areas, to highly complex incidents with very widespread physical or economic consequence. The response to such an incident would require specialized personnel and resources beyond the capabilities of Lake County and its municipalities, and would require assistance from mutual aid organizations, adjacent counties, the State of Florida, and the Federal government.

2. *Location and Extent*

Lake County has many facilities and systems that are considered to be critical infrastructure; whose continued and uninterrupted operation is necessary for the health, safety and well-being of the community. These facilities could be considered potential targets for a terrorist attack which could have potentially widespread consequences for adjacent neighborhoods or the community as a whole. With Lake County's close vicinity to Orange County and the popular tourist destinations located within, Lake County could be considered a host-county in the event a major catastrophic terrorist event should occur.⁴²

3. *Previous Occurrences*

Historically, Lake County and its jurisdictions have been fortunate not to have experienced any terrorist related incidents in the past.

4. *Probability of Future Events*

The probability of a terrorist act within Lake County is considered low with a minimum to moderate impact. However, due to the close vicinity to Orange County and the popular tourist destinations located within, Lake County could be considered a host-county in the event a major catastrophic terrorist event should occur.

Historically, there had been few successful acts of terrorism committed in the State. However, with the heightened level of national terrorism events, and because of the number of facilities within the State associated with tourism, the military, government, cultural, academic, and transportation, the potential is considered to be high nationwide. In Lake County, terrorism assessments have identified facilities that have the potential for being targets for terrorist attacks with the intent of causing psychological effects of the appearance of terrorism, catastrophic levels of loss of life, injury, and property and environmental damage.

5. *Vulnerability and Risk Assessment*

Lake County's vulnerability to the consequences of a terrorist attack on its facilities or systems include, but are not limited to:

- Disruption to the ability to initiate and sustain emergency response operations
- Increased safety risks to the community from the release of hazardous materials or dangerous substances

⁴² Lake County Comprehensive Emergency Management Plan, 2018

- Disruption to the ability to maintain governmental functions, including: law enforcement, public health and safety, public utility systems, education, and other critical operations
- Threats to institutions serving large numbers of individuals with higher vulnerability to the health and safety consequences
- Threats to the economic vitality of the community and its businesses
- Damage or disruption to components of the transportation or utility infrastructure resulting in additional physical or economic consequences

Considering all of these factors, terrorism would generally have a moderate impact to Lake County and its jurisdictions.

s) Prolonged Utility/Communications Failure

1. *Description*

A utility failure can result from a variety of related causes, including sagging lines due to hot weather, flashovers from transmission lines to nearby trees and incorrect relay settings. According to the electric utility industry's trade association, the potential for such disturbances is expected to increase with the profound changes now sweeping the electric utility industry.

A communication failure is defined as the severe interruption or loss of private and or public communications systems, including but not limited to transmission lines, broadcast, relay, switching and repeater stations as well as communications satellites, electrical generation capabilities, and associated hardware and software applications necessary to operate communications equipment. These disruptions may result from equipment failure, human acts (deliberate or accidental), or the results of natural or human made disasters.

2. *Location and Extent*

A prolonged utility failure can have the following potential impacts on Lake County: electrical power outage, surface and air transportation disruption, potable water system loss of disruption, sewer system outage, telecommunication system outage, human and health safety, psychological hardship, economic disruption, and disruption of community services. All municipalities are at equal risk for prolonged power outages; however, some communities may be restored more quickly than others depending on other high priority locations with which they share a grid.

A prolonged communications failure would affect essential facilities and the day to day operations of local government as well as the business community. Sites of concern would range from dispatch agencies, satellite uplink and downlink sites, internet service provider sites, and the telecommunication industry switching sites. Interruptions in day to day communications would create problems for businesses, public agencies, citizens and emergency services.

3. *Previous Occurrences*

Utility failure/disruption occurs on a daily basis and is typically minor and services are restored quickly. Most of the prolonged utility failure/disruption is directly associated with

other contributing hazards such as hurricanes, tornadoes, floods, technological failures etc.

4. *Probability of Future Events*

While the probability of future power failure incidents in Lake County is difficult to predict, the historic record indicates that significant power failures have occurred. Data is not readily available on the frequency of smaller power outages across the county; however, it is reasonable to assume that power failure events of shorter duration will continue to occur in the future. The potential for another major power failure that disrupts power for Lake County residents is always possible, yet are expected to occur less frequently than smaller incidents. In addition, future changes in climate may also impact the frequency and probability of future power failure occurrences.

5. *Vulnerability and Risk Assessment*

Loss of electricity can lead to the inability to use electric-powered equipment, such as: lighting; heating, ventilation, and air conditioning (HVAC) and necessary equipment; communication equipment (telephones, computers, etc.); small appliances such as refrigerators and medical equipment. This all can lead to food/medical supply spoilage, loss of heating and cooling. Utility failure can also pose a threat to the general population of Lake County regarding the loss of communications, gas, and water supply that are critical to ensure the health, safety, and general welfare of the population. The special needs population can be especially vulnerable to loss of heat or air conditioning during extreme weather conditions.

Considering all of these factors, prolonged utility failure/disruption would generally have a moderate impact to Lake County and its jurisdictions.

t) Mass Casualty

1. *Description*

A Mass Casualty Incident (MCI) is any incident in which emergency medical services resources, such as personnel and equipment, are overwhelmed by the number and severity of casualties.

2. *Location and Extent*

A mass casualty incident can be caused by various incidents/factors. Largely these are associated with the following examples: terrorism; large gatherings/special events; biological; and transportation.

An MCI will be classified by different levels depending on the number of victims. These levels are as follows:

- MCI Level 1 (5-10 victims)
- MCI Level 2 (11-20 victims)
- MCI Level 3 (over 21 victims)
- MCI Level 4 (100 victims or greater, major MCI)
- MCI Level 5 (1000 victims or greater, major MCI)

Any location in Lake County is at risk of experiencing a mass casualty event. Areas or events that are densely populated within the of the county that could potentially be more likely targets for a mass casualty event, especially one caused by terrorism.

3. *Previous Occurrences*

Historically, Lake County and its jurisdictions have been fortunate not to have experienced large/major mass casualty incidents in the past.

4. *Probability of Future Events*

The probability of disasters involving mass casualties resulting from the factors listed is considered possible, although the probability is low within lake county.

5. *Vulnerability and Risk Assessment*

As previously mentioned, any location in Lake County is at risk of experiencing a mass casualty event, especially those that are more densely populated. Additionally, any areas surrounding a mass casualty event will be in danger of additional injuries and fatalities depending on the type of incident. A mass casualty event can be particularly chaotic for first responders who can become quickly overwhelmed by responding simultaneously to the crisis and consequences of an attack. In the event of a terrorist attack, response could become inhibited due to debris on the road, traffic, or airborne disease/chemicals. Access must be coordinated in order to perform effective rescue efforts. First responders may also be targeted in the event of secondary attacks. Considering all of these factors, a mass casualty incident would generally have a moderate impact to Lake County and its jurisdictions.

III. VULNERABILITY ASSESSMENT METHODOLOGY AND CONCLUSIONS

The Local Mitigation Strategy must include an assessment of vulnerability to all hazards.⁴³ For some hazards such as lightning, hail, high winds, excessive heat, and freezes, all jurisdictions are equally at risk and have similar hazard vulnerabilities. For other hazards, some areas are more vulnerable than others due to geographical or property characteristics. These hazards include: flooding, sinkholes, wildfires, and dam/levee failure.

A. Assessing Vulnerabilities

a) Repetitive Loss Properties

The Flood Mitigation Assistance (FMA) Grant Program was created as part of the National Flood Insurance Reform Act (NFIRA) of 1994 to reduce or eliminate claims under the National Flood Insurance Program (NFIP). The FMA Grant program was updated in FY 2013 by the Flood Insurance Reform Act of 2012 (Public Law 112-114). The primary objective of the Repetitive Loss Properties Strategy is to eliminate or reduce the damage to property and the disruption of life caused by repeated flooding of the same properties. A specific target group of repetitive loss properties is identified and serviced separately from other NFIP policies by the Special Direct Facility (SDF). The target group included every NFIP-insurance policy that since 1978 and regardless of an ownership change during that period has experienced:

- Insurance property with 2 flood claims where the repairs equaled or exceeded 25% of the market value of the structure at the time of the flood event.
- Insured property with flood history of 4 or more separate claims of \$5,000 each with cumulative total exceeding \$20,000 or at least 2 claim payments where the cumulative amount of 2 claims exceeds the market value of the structure.

Although the FMA Grant Program is federally funded, and administered through a partnership with the Florida Division of Emergency Management (FDEM), local and Native American Tribal governments, and the Federal Emergency Management Agency. Authority and responsibility for developing and maintaining a State Mitigation Plan, assisting local and Native American Tribal governments in developing and maintaining Flood Mitigation Plans, reviewing FMA Grant sub-applications, recommending cost effective sub-applications to FEMA and providing pass-through grant funds to awarded FMA Grant projects from eligible sub-applicants resides with FDEM. They also are responsible for ensuring the projects funded are completed and all reporting requirements are met.

As of 2020 LMS plan update, there are nine (9) repetitive loss properties in Lake County (Astor), and all are residential and are located in unincorporated Lake County. There are no documented repetitive loss properties in the municipalities participating in this plan. The Lake County Department of Public Works continues efforts to work with these property owner(s) to find possible solutions to the flooding problems. Total payments made for all repetitive flood loss properties in the past has been \$953,534. Lake County and the jurisdictions are continuing to work with property owners to resolve all issues related to repetitive flooding.

⁴³ United States Code of Federal Regulations 44 CFR 201.6(c)(2)(ii)

b) Local Match Requirement/Potential Funding Sources

A very important component of the application process for mitigation process is the identification of funding source(s) to meet the local match requirements for respective projects. While cash match provided by the applicant is an option, the identification of outside funding sources is often sought to create less financial hardship for the applicant. There are a variety of other programs that could potentially be viable sources for mitigation projects. While they all have their own programmatic rules and requirements, there is often the ability to use these programs as tools and resources to assist in the completion of mitigation projects.

The first source of funding may come from the various programs sponsored by the Florida Division of Emergency Management (FDEM). Various Federal programs under the direction of the FDEM Mitigation Unit are a potential resource as well, such as the National Flood Insurance Program, the Flood Mitigation Assistance Program, and the Pre-Disaster Mitigation Program. There is also the Residential Construction Mitigation Program (RCMP), which provides technical and financial resources to homeowners for hurricane retrofitting. If homeowners are recommended for the program, they are eligible for a forgivable loan to complete the retrofitting recommendations. Since, 2010, the Repetitive Flood Claims Program and the Severe Repetitive Loss Program were eliminated.

There are also other programs offered, such as the Community Development Block Grant (CDBG) Program and Florida Communities Trust; the Florida Department of Environmental Protection's Florida Coastal Management Program, and various programs under the US Army Corps of Engineers; US Department of Agriculture; US Department of Commerce; US Department of Homeland Security; and the US Department of Housing and Urban Development. This list is not exhaustive, as there are also various other agencies and organizations that provide funding opportunities. This list will continue to be improved upon and shared with mitigation partners in order to assist them in their planning and funding efforts.

B. Land Use Trends and Potential Loss

Land use especially within hazard-prone areas has an impact on vulnerability as some uses may be more prone to disaster related damages than others. Residential and industrial development are examples of this. Individual jurisdictions have the most significant and legal authority over land use policy and can make an analysis of potential land use projects to determine if a mitigation strategy is necessary. Local current land uses and potential for new development reports along with future land use and general development trends are indicative of how future development will impact the LMS for Lake County. Careful consideration of potential risk from various hazards can help guide thoughtful land use to minimize vulnerabilities in the future. When necessary to further local effort, modifications to plans, ordinances, codes and similar policies can be proposed as initiatives for consideration into the LMS.

The Lake County Comprehensive Plan 2030⁴⁴ guides future development through policies and procedures consistent with the County's growth objectives. This plan identifies current and future development trends.

⁴⁴ https://www.lakecountyfl.gov/offices/planning_and_zoning/comprehensive_planning/

C. Critical Facilities and Structures

Lake County maintains an inventory of critical facilities, infrastructure and structures that are located within hazard area. This list includes but is not limited to emergency services facilities, medical facilities, government facilities, schools, emergency/evacuation shelters, fire and police stations, emergency operation center, facilities used by special needs populations, and any other facilities identified by Emergency Management. This list is updated annually.

The LMS Working Group has identified goals and objectives to guide the development of this plan. These goals and objectives provide focus for the activities of the LMS Working Group toward mitigation efforts that will meet the needs of the jurisdictions.

The goals selected by the LMS Working Group are related to the broad mitigation needs and capabilities of the communities involved, rather than addressing a specific hazard type or category. Therefore, these mitigation goals and objectives are multi-hazard and are the mitigation related capabilities that are important to Lake County. These will be present in each participating jurisdiction in the future as the goals are achieved.

D. Mitigation Actions

Each goal is following by several objectives that provide more specific steps to be taken by the LMS Working Group and the jurisdictions to achieve the broad-based, long-range direction for planning. Objectives define the steps that are actionable for implementation by the LMS Working Group and associated community partners.

The objectives are intended to guide selection and implementation of mitigation projects that are included in the project list. The closer the goals and objectives are to reaching a more resilient, disaster community, completion of those projects will further improve the community and achieve the goals of the mitigation planning process.

Since the 2010 plan, Lake County has completed four projects and one was terminated. This list is included in Appendix I. Projects that remain open are generally open due to the fact that match funding is even more difficult to find within local government budgets and mitigation initiatives and generally do not take precedence over providing the basic services that are expected to be provided by local governments to citizens. Also, it is important to note that although a project may be listed as completed, that does not mean it was necessarily funded by FEMA. The initiative may have been completed by the local government on its own or was funded by alternative funding sources. This document is meant to be a planning tool that is not completely reliant on FEMA assistance to add, fund, or complete projects identified within the plan.

It is anticipated that the list of completed projects will grow as there is one mitigation project currently underway as of the plan update that is not yet completed. The intent is to identify a comprehensive range of hazards with involvement by all jurisdictions within Lake County. Every jurisdiction has an identifiable project/action item within the LMS project listing. Appendix I identifies all of the projects, listed by priority score.

IV. MITIGATION GOALS AND OBJECTIVES

Goal 1: Local government will have the capability to develop, implement, and maintain effective mitigation programs.

Objective 1.1: Data and information needed for defining hazards, risk areas, and vulnerabilities will be readily available.

Objective 1.2: Emergency services organizations will have the capability to detect emergency situations and promptly initiate emergency response operations.

Objective 1.3: The capability to effectively utilize available data and information related to mitigation planning and program development will be available.

Objective 1.4: The effectiveness of mitigation initiatives implemented in the community will be measured and documented.

Objective 1.5: There will be a program to derive mitigation “lessons learned” from each significant disaster event occurring in or near the community.

Objective 1.6: Up-to-date technical skills in mitigation planning and programming will be available for the community.

Goal 2: All sectors of the community will work together to create a disaster resistant community.

Objective 2.1: A business continuity and recovery program will be established and implemented in the community.

Objective 2.2: Local agencies and organizations will establish specific interagency agreements for the development and implementation of mitigation-related projects and programs.

Objective 2.3: Local elected governing bodies will promulgate the local mitigation plan and support community mitigation programming.

Objective 2.4: Outreach programs to gain participation in mitigation programs by business, industry, institutions, and community groups will be developed and implemented.

Objective 2.5: The community will be periodically updated regarding local efforts in mitigation planning and programming.

Objective 2.6: The community’s public and private sector organizations will partner to promote hazard mitigation programming throughout the community.

Goal 3: The community will have the capability to initiate and sustain emergency response operations during and after a disaster.

Objective 3.1: Designated evacuation routes will be maintained and improved wherever possible to remain open before, during, and after disaster event.

Objective 3.2: Designated evacuation shelters will be retrofitted or relocated to ensure their operability during and after disaster events.

Objective 3.3: Local emergency services facilities will be retrofitted or relocated to withstand the structural impacts of disasters.

Objective 3.4: Response capabilities will be available to protect visitors, special needs individuals, and the homeless from a disaster's health and safety impacts.

Objective 3.5: Shelters or structures for vehicles and equipment needed for emergency services operation will be retrofitted or relocated to withstand disaster impacts.

Objective 3.6: Utility and communications systems supporting emergency services operations will be retrofitted or relocated to withstand the impacts of disasters.

Objective 3.7: Vehicle access routes to key health care facilities will be protected from blockage as a result of a disaster.

Goal 4: The continuity of local government operations will not be significantly disrupted by disasters.

Objective 4.1: Buildings and facilities used for the routine operations of government will be retrofitted or relocated to withstand the impacts of disasters.

Objective 4.2: Community redevelopment plans will be prepared to guide decision-making and resource allocation by local government in the aftermath of a disaster.

Objective 4.3: Important local government records and documents will be protected from the impacts of disasters.

Objective 4.4: Plans and programs will be available to assist local government employees in retrofitting or relocating their homes to ensure their availability during a disaster.

Objective 4.5: Plans will be developed, and resources identified, to facilitate reestablishing local government operations after a disaster

Objective 4.6: Redundant equipment, facilities, and/or supplies will be obtained to facilitate reestablishing local government operations after a disaster

Goal 5: Mitigation efforts will be a continuing activity to protect the health, safety, and welfare of the community's residents.

Objective 5.1: Adequate systems for notifying the public at risk and providing emergency instruction during a disaster will be available in all identified hazard areas.

Objective 5.2: Effective structural measures will be developed to protect residential areas from the physical impacts of disasters.

Objective 5.3: Facilities in the community posing an extra health or safety risk when damaged or disrupted will be made less vulnerable to the impacts of a disaster.

Objective 5.4: Public and private medical and healthcare facilities in the community will be retrofitted or relocated to withstand the impacts of disasters.

Objective 5.5: Residential structures will be removed or relocated from defined hazard areas.

Objective 5.6: Residential structures will be retrofitted to withstand the physical impacts of disasters.

Objective 5.7: Safety devices on transportation networks will not fail because of a disaster.

Objective 5.8: Structures, facilities, and systems serving visitors to the community will be prepared to meet their immediate health and safety needs.

Objective 5.9: There will be adequate resources, equipment, and supplies to meet victims' health and safety needs after a disaster.

Goal 6: The policies and regulations of local government will support effective hazard mitigation programming throughout the community.

Objective 6.1: All reconstruction or rehabilitation of local government facilities will incorporate techniques to minimize the physical or operational vulnerability to disasters.

Objective 6.2: Land use policies, plans, and regulations will discourage or prohibit inappropriate location of structures or infrastructure components in areas of higher risk.

Objective 6.3: Local governments will ensure that hazard mitigation needs and programs are given appropriate emphasis in resource allocation and decision-making.

Objective 6.4: Local governments will establish and enforce building and land development codes that are effective in addressing the hazards threatening the community.

Objective 6.5: Local governments will protect high hazard natural areas from new or continuing development.

Objective 6.6: Local jurisdictions will participate fully in the National Flood Insurance Program and the associated Community Rating System.

Objective 6.7: New local government facilities will be located outside of hazard areas and/or will be designed to not be vulnerable to the impacts of such hazards.

Objective 6.8: Reconstruction and rehabilitation of structures and utilities in the community will incorporate appropriate hazard mitigation techniques.

Objective 6.9: Regulations will be established and enforced to ensure that public and private property maintenance is consistent with minimizing vulnerabilities to disaster.

Goal 7: Community residents will have homes, institutions, and places of employment that are less vulnerable to disasters.

Objective 7.1: Economic incentive programs for the general public, businesses, and industry to implement structural and non-structural mitigation measures will be established.

Objective 7.2: Local government will support key employers in the community in the implementation of mitigation measures for their facilities and systems.

Objective 7.3: Programs for removal, relocation, or retrofitting of vulnerable structures and utilities in hazard areas will be established and implemented.

Objective 7.4: The vulnerability to disasters of schools, libraries, museums, and other institutions important to the daily lives of the community will be minimized.

Goal 8: The community's economic vitality will be less threatened by a disaster.

Objective 8.1: Components of the infrastructure needed by the community's businesses and industries will be protected from the impacts of disaster.

Objective 8.2: Local government emergency response and disaster recovery plans will appropriately consider the needs of key employers in the community.

Objective 8.3: Local government will encourage community businesses and industries to make their facilities and operations disaster resistant.

Objective 8.4: Local government will establish programs, facilities, and resources to support business resumption activities by impacted local businesses and industry.

Objective 8.5: Local government will implement programs to address public perceptions of community condition and functioning in the aftermath of a disaster.

Objective 8.6: Local government will strive to diversify the employment base of the community.

Goal 9: The community's infrastructure will be better protected and less vulnerable to a disaster.

Objective 9.1: Local governments will encourage hazard mitigation programming by private sector organizations owning or operating key community utilities.

Objective 9.2: Routine maintenance of the community's infrastructure will be done to minimize the potential for system failure because of or during a disaster.

Objective 9.3: Sources of energy normally used by the community will not be unwarrantedly vulnerable to the impacts of a disaster.

Objective 9.4: The telecommunications systems and facilities serving the community will not be unwarrantedly vulnerable to the impacts of a disaster.

Objective 9.5: Transportation facilities and systems serving the community will be constructed and/or retrofitted to minimize the potential for disruption during a disaster.

Objective 9.6: Water and sewer services in the community will not fail because of a disaster.

Goal 10: Members of the community will have the opportunity to learn of the hazards threatening local areas and the techniques to minimize vulnerability to those hazards.

Objective 10.1: All interested individuals will be encouraged to participate in hazard mitigation planning and training activities.

Objective 10.2: Education programs in risk communication and hazard mitigation will be established and implemented.

Objective 10.3: Managers of public facilities will be knowledgeable in hazard mitigation techniques and the components of the community's mitigation plan.

Objective 10.4: Technical training in mitigation planning and programming will be given to appropriate local government employees.

Objective 10.5: The owners and operators of businesses and industries in the community will be knowledgeable in appropriate hazard mitigation techniques.

Objective 10.6: The public living or working in defined hazard areas will be aware of that fact, understand their vulnerability, and know appropriate mitigation techniques.

Objective 10.7: The public will have facilitated access to information needed to understand their vulnerability to disasters and effective mitigation techniques.

A. Addressing Known Risks and Vulnerabilities

Proposed mitigations projects, in addition to meeting the long-range intent of the goals and objectives, are used to address known problem areas in the community. These can include hardening and retrofitting or existing critical facilities as well as addressing stormwater issue in known problem areas. These may not projects can be used to address problems that do not necessarily affect an entire neighborhood but can cause unsafe conditions or damage properties.

V. NATIONAL FLOOD INSURANCE PROGRAM (NFIP) AND COMMUNITY RATING SYSTEM (CRS)

Flood insurance is designed to provide an alternative to disaster assistance to reduce the escalating costs of repairing damage to buildings and their contents caused by floods. In addition to providing flood insurance and reducing flood damages through floodplain management regulations, the NFIP identifies and maps the Nation's floodplains. Mapping flood hazards creates broad-based awareness of the flood hazards and provides the data needed for floodplain management programs and to actuarially rate new construction for flood insurance. Flood insurance policy information is listed in the table below.

All jurisdictions (Astatula, Clermont, Eustis, Fruitland Park, Groveland, Howey-in-the-Hills, Lady Lake, Lake County, Leesburg, Mascotte, Minneola, Montverde, Mount Dora, Tavares, Umatilla) participate in the NFIP. The Lake County Office of Emergency Management and the LMS Working Group will continue to promote and educate the community about the benefits of this program and its implications on reducing flood hazards throughout the community. Jurisdictions within Lake County are continuing to conduct a variety of activities associated with the NFIP. Activities include, but are not limited to:

- Collecting flood elevation certificates
- Eliminating repetitive flood loss properties
- Informing residents of map changes
- Adopting new maps

As the jurisdictions of Lake County adopt the Local Mitigation Strategy, the list of actions related to the NFIP within individual jurisdictions will continue to be refined and updated to reflect the most comprehensive list of possible activities within the LMS relating to the NFIP and CRS.

The Community Rating System (CRS) is a voluntary program for NFIP-participating communities. The goals of the CRS are to reduce flood losses, facilitate accurate insurance rating, and to promote the awareness of flood insurance. The CRS has been developed to provide incentives in the way of premium discounts for communities to go beyond the minimum floodplain management requirements to develop extra measures to provide protection from flooding. At this update, only Lake County is participating in the CRS and has a rating of 7 as of October 1, 2020.

Table 16: Flood Insurance Policy Information in Lake County⁴⁵

Community Name	Policies In-force	Total Coverage	Total Written Premium +FPF
<i>Astatula</i>	6	\$1,192,400	\$3,361
<i>Clermont</i>	228	\$69,403,900	\$97,053
<i>Eustis</i>	120	\$33,980,400	\$56,500
<i>Fruitland Park</i>	87	\$26,193,500	\$35,046
<i>Groveland</i>	173	\$51,115,500	\$83,683
<i>Howey-in-the-Hills</i>	14	\$3,778,000	\$4,521
<i>Lady Lake</i>	156	\$37,669,400	\$74,306
<i>Lake County</i>	2,371	\$602,696,100	\$1,230,779
<i>Leesburg</i>	260	\$69,364,500	\$136,321
<i>Mascotte</i>	15	\$3,669,400	\$6,025
<i>Minneola</i>	43	\$10,970,400	\$23,320
<i>Montverde</i>	15	\$4,581,900	\$5,921
<i>Mount Dora</i>	218	\$64,892,600	\$100,011
<i>Tavares</i>	119	\$30,641,000	\$63,506
<i>Umatilla</i>	15	\$3,573,500	\$5,862

⁴⁵ <https://www.fema.gov/policy-claim-statistics-flood-insurance>

VI. IMPLEMENTATION

A. Prioritization of Projects

Prior to the 2010 plan, a program called Mitigation 20/20 was used to rank Lake County's mitigation projects. In preparation for the 2010 update, it was decided to use a different method to rank future projects and the LMS Working Group agreed that it would be acceptable use the STAPLEE method to prioritize the mitigation projects. The STAPLEE model is still the accepted method for rating projects on the project list.

The STAPLEE acronym stands for Social, Technical, Administrative, Political, Legal, Economic, and Environmental factors and the dimensions along which each project is measured. The STAPLEE system assesses each project using a scale that allows for a raw score to be derived. There were 7 different dimensions that were further divided into 22 smaller criteria considerations. The projects were rated using a scale of 1 to 5 for each smaller unit with a 1 being very unfavorable and a 5 being very favorable. A 3 would be considered neither favorable nor unfavorable. The higher a project scored the higher it would be placed on the priority list since this meant it received more "favorable" scores on the criteria consideration.

All projects up until the 2010 plan update have used the old rating criteria. All new projects submitted for consideration to the LMS Working Group since the 2010 update were scored using the STAPLEE criteria. The project listing, as shown within Appendix I, shows the projects ranked using both the old and new criteria. The LMS Working Group wants to ensure that not only is the most user-friendly scoring used for this process, but that all municipalities feel the rating criteria results in their projects being fairly ranked for funding consideration. The LMS Working Group will continue to refine the scoring process as needed.

A table outlining the STAPLEE method is on the next page.

Table 17: Using the STAPLEE Method to Prioritize Projects

Dimension	Criteria	Description
<u>Social</u>	Community Acceptance	Will this project not be objectionable to a large majority of the population being impacted by the hazard?
<i>Social</i>	Effect on Segment of Population	Thinking of all immediate, direct, and indirect side effects of the implementation of this project, what will the effect be on the segment of the population (things to consider: property access, construction noise, inconvenience of actions)?
<u>Technical</u>	Technically Feasible	Most of the projects are at such a scale that they need to be technically feasible at the time they are submitted to the list.
<i>Technical</i>	Long-Term Solution	Does the project in, and of, itself or as a part of a large comprehensive program represent a long-term solution to the problem at hand?
<i>Technical</i>	Secondary Impacts	Secondary impacts include things like scalability of solutions and potential re-use of technologies used in the project.
<u>Administrative</u>	Staffing	Do you have enough staff to administer and manage the project?
<i>Administrative</i>	Funding Allocation	Are there funds currently budgeted for the project?
<i>Administrative</i>	Maintenance/Operations	Will you have enough personnel to maintain and operate the project, if applicable?
<u>Political</u>	Political Support	What do the elected officials think of the project? Are they aware of it? What might they think of it? The existence of a single person or group of persons that is very vocal in their support for a project might make it easier to realize the mitigation action. What does the community think about the project? Do they think it is a fair use of resources?
<i>Political</i>	Local Champion	The existence of a single person or group of persons that is very vocal in their support for a project might make it easier to realize the mitigation action.
<i>Political</i>	Public Support	What does the community think about the project? Do they think it is a fair use of resources?
<u>Legal</u>	State Authority	Does the state have jurisdiction with this kind of project?

Dimension	Criteria	Description
<i>Legal</i>	Existing Local Authority	Does the municipality have the legal authority to undertake the project?
<i>Legal</i>	Potential Legal Action	Will the project potentially cause legal action?
<u><i>Economic</i></u>	Cost of Action	How expensive is the project?
<i>Economic</i>	Benefit of Action	How many and how great are the benefits to the project?
<i>Economic</i>	Contributes to Economic Goals	Does the project align with your community's economic goals?
<i>Economic</i>	Outside Funding Required	Will you need outside funding to finance your share of the cost?
<u><i>Environmental</i></u>	Effect on Land and Water	What are the long-term effects on the land and water on and adjacent to the site?
<i>Environmental</i>	Effect on Endangered Species	Will any endangered species be impacted by the project?
<i>Environmental</i>	Consistent with Community Environmental Goals	Will the project be consistent with the community's environmental goals?
<i>Environmental</i>	Consistent with Federal Laws	Will the project be in any danger of breaking any federal rules or regulations?

Projects will be submitted to the LMS Working Group for consideration and must include a cost-benefit analysis and a scoring form. Projects can be submitted to the group at any time and action will be taken at the next LMS Working Group meeting. At any time, the LMS Working Group may choose to review the project list and update the prioritization ranking. Environmental factors may dictate that some projects need to be considered due to current conditions that require a project to be moved up on the list for available funding. Other factors may lead to this review include declared disasters, funding availability, new or revised policy development, plan revision cycles, legal or fiscal restraints, and life safety priorities.

VII. MITIGATION PROJECT PRIORITY LIST

The project priority list is located in Appendix I of this plan and also includes completed and deleted project lists.

A. Responsible for Mitigation Actions

The implementation and completion of approved mitigation projects will be administered by the jurisdiction, agency, or organization that proposed the project. On an annual basis, the Lake County Office of Emergency Management, in coordination with the LMS Working Group, will check the status of the mitigation initiatives to ensure that efforts have been made to complete any projects on the LMS project list. This approach is utilized as only the jurisdiction, agency, or

organization that proposed the project has the authority or responsibility for implementation. During the plan implementation process, the LMS Working Group monitors the status of projects, assigns priorities, and will take other action for support and coordination.

B. Cost-Benefit Analysis

When a project is submitted to the LMS Working Group, it must be accompanied by a cost-benefit analysis (CBA) for consideration. Projects not including a CBA will be returned to the proposer for completion of the appropriate information prior to resubmission. A copy of a form that has been accepted for documenting the CBA has been included in the appendix to this plan behind the project lists. This form can be utilized by the proposer to document what the costs are associated with a proposed project and estimate the value that will be received as a benefit resulting from completion of the project. The cost benefit analysis results will be factored into the prioritization process to determine the project ranking.

C. Actions Completed

Any project that has been funded and completed will be added to the Completed Project List regardless of the source of funding. Lake County Emergency Management maintains all project lists for Lake County. The project list can change as funding, requirements, etc. change and/or are updated. For deleted projects, an explanation is included to document the action. The LMS committee periodically reviews the project lists to determine ongoing eligibility and feasibility. Projects may be closed or withdrawn at the discretion of the committee.

VIII. PLAN MAINTENANCE

A. LMS Monitoring and Evaluation

Lake County continues to maintain the Local Mitigation Strategy as a mechanism to guide mitigation actions that are being pursued in both the incorporated and unincorporated areas. The LMS Plan is housed in the Lake County Office of Emergency Management. One of the primary methods by which to maintain the plan is to track the status of the mitigation initiatives. The Lake County Office of Emergency Management has devised a database management system that tracks the projects as they are completed in the county to monitor progress. The Lake County LMS Working Group will make attempts to complete projects within five years (before the next plan update) as funding becomes available.

The LMS Working Group will meet at least annually to discuss any projects or changes that might have occurred that would be addressed by the update. Meetings can and will be scheduled following after times of natural disaster events and other times as deemed appropriate by the LMS Working Group Chair. Criteria used to evaluate the LMS Document and activities should include and are not limited the following situations:

- Change in requirements at any governmental level
- Changes in development trends and land use
- Completion of existing mitigation projects and introduction of new goals
- Changes in policy, procedure, or code

- Changes in building codes and practices
- Review of legislative actions that could affect funding of mitigation efforts
- Changes in Flood Insurance Rate Maps, National Flood Insurance Program, etc.

These meetings will be organized by the Lake County Office of Emergency Management. This meeting will result in the preparation of the Annual LMS Progress Report that will be submitted to the state and satisfy the annual CRS program requirement as well. The Lake County Office of Emergency Management will maintain an up-to-date list of all active working group members will be utilized as a distribution list for notification.

Since the last revision of the LMS there has not been any significant changes to development in Lake County that would impact the hazards identified within this plan. As of this writing, there are no anticipated development changes or trends that would impact these hazards in the future. This of course is subject to change in the future and will be a topic to be considered at future LMS meetings.

At each LMS meeting, representatives will report on the current status of projects, and if a project's scope or details have changed. It may also be reported that the project has been cancelled all together, in which case the project will be removed from the mitigation initiative prioritization list with an explanation. All changes and activities as a result of the LMS meeting will be considered part of the overall evaluation process, which will be administered and documented by the Office of Emergency Management and become an official component of the LMS.

The LMS Working Group will use the following criteria, among others, as a starting point for monitoring the overall LMS process:

- Goals and objectives address current and expected conditions
- The nature, magnitude and/or type of risks have changed
- The current resources are appropriate for implementing the plan
- There are implementation problems, such as technical, political or coordination issues with other agencies
- The outcomes have occurred as expected (demonstrating progress)
- The agencies and other partners participated as originally proposed

B. LMS Updates

An important key of the planning process is to begin thinking about the steps to update the plan prior to the next review date, which is in 2025. Revisions to the plan will start at least 12 months prior to the existing plans next required update, with Lake County providing drafts to state staff for preliminary comments ahead of time. This will ensure that the plan remains in active status and does not lapse for any period of time between plan review periods. Based on experience, it is easy to underestimate the time that it takes to complete the plan update.

In addition to the ongoing maintenance of the plan and LMS activities, the staff of the Office of Emergency Management assigned to handle mitigation activities will be responsible for the Five-

Year Update. The expectation is that continual review and refinements of the LMS Plan between plan updates will allow future updates to go smoothly. The update of the plan will take place by reading the document, identifying items to be fixed and utilizing a computer to make edits to the LMS document. This will occur as changes need to be made, instead of doing all of the changes at once for the five-year update. The Office of Emergency Management will continue to update the plan and be the responsible organization for this activity. This will be accomplished through continual review of the plan by LMS Working Group and support staff, as well as input from the general public.

Notice of upcoming meetings will be posted for at least ten days prior to the date of the meeting and available by the following means:

- Lake County LMS Website notice
- Email distribution list maintained by Lake County Emergency Management
- Notice published in local newsprint

Updates will be identified through the input of anyone with sound ideas to improve the plan from Lake County staff, LMS Working Group members and from the general public. Staff from the Office of Emergency Management assigned LMS responsibilities will update the electronic version of LMS document. The LMS Working Group will review the plan proposed to be submitted for the next update, guide changes as necessary and have final approval of the updated plan to be forwarded to state and federal counterparts for review and ultimate approval.

C. Implementation through Existing Plans and Programs

While some jurisdictions have taken steps towards integrating mitigation actions into their plans, some have not explicitly addressed these matters within their documents. It is important that some or all of the goals and actions of this local mitigation strategy be incorporated into other plans so that they will have a greater chance of being accomplished. Integrating plans is accomplished by having groups invite each other to each other's meetings. Information sharing ensures that the common elements are understood and documented within the various plans within Lake County. Through upcoming meetings that will be taking place with jurisdictions to adopt the Lake County LMS, integrating the LMS with their respective planning mechanisms is discussed and encouraged to promote further continuity. During individual plan review processes, suggested revisions and/or mitigation initiatives are identified for implementation into those plans.

Some of the County-wide plans and LMS integration efforts identified include:

- Lake County Comprehensive Emergency Management Plan (2018) – The CEMP incorporates elements of the LMS to identify hazard vulnerabilities and risks, as well as mitigation efforts to reduce potential risk throughout the County.
- Lake County Comprehensive Use Plan (2012) – The Comprehensive Plan supports LMS policies, including: capital improvements, land development regulations, conservation and wetland protection efforts, hazard mitigation, and post-disaster redevelopment.

- Lake County Code of Ordinances Chapter VI – Resource Protection Standards, 6.01.02: Wetlands Impact and Mitigation, and the Lake-Sumter Metropolitan Planning Organization (MPO) Transportation Plan.
- Lake County Community Wildfire Protection Plan (CWPP) – The CWPP was a stand-alone document. The 2020 LMS incorporates the requirements of the CWPP and acts as a replacement document to ensure the continued review and update of those requirements as they relate to the County.

Below is a listing of other plans, etc. that exist in the municipalities that further the goals and objectives of the LMS.

Table 18: Municipality Policies Supporting Lake County LMS

Jurisdiction	Policies
<i>Astatula</i>	<ul style="list-style-type: none"> • Policy 1-1.1.3: Firewise (Wildfire) • Policy 1-1.2.1: Wetlands development (Flooding) • Policies 1-1.2.2/5-1.8.2: Floodplain (Flooding) • Policies 1-1.2.4/5-1.2.13: Land development (Sinkholes) • Policies 401.11.1/4-2.1.1/4-2.3.2: Wells/City Connection (Sinkholes/Drought) • Policy 5-1.1.4: Construction (Erosion)
<i>Clermont</i>	<ul style="list-style-type: none"> • Policies 2-1/2-2: Land Use Density (Flooding) • Policies 2-16/3-5: Land Use Wetlands/Floodplain (Flooding) • Policy 2-2: Public Facilities Septic (Flooding)
<i>Eustis</i>	<ul style="list-style-type: none"> • Policies 1.4.1/2.1.1/2.1.2: Conservation (Flooding) • Policy 1.2.2: Land Use (Flooding)
<i>Fruitland Park</i>	<ul style="list-style-type: none"> • Policy 1-2.2: Floodplain (Flooding) • Policy 1-2.4: Setbacks (Sinkholes) • Policies 1-1.2/3-1.4: Open Space
<i>Groveland</i>	<ul style="list-style-type: none"> • Obj 7.8 Conservation (Flooding/Sinkholes) • Obj 7.2/7.10/7.13: Conservation Development (Flooding)
<i>Howey in the Hills</i>	<ul style="list-style-type: none"> • Policy 1-2.2.2: Floodplain (Flooding) • Policy 1-1.2.4: Sinkhole filling (Sinkholes) • Policies 4-2.3.1/5-1.7.1: Storm Water/Erosion (Flooding/Erosion) • Policies 5-1.8.1/8-1.2.1: Floodplains Development (Flooding)
<i>Lady Lake</i>	<ul style="list-style-type: none"> • FLU 1-9.3/2-4.4/3-2.2: Density/Development (Flooding/Erosion) • Goal Pub 6/Policy CIP 102.2/Policy Con 1-11.1: Floodplain (Flooding)
<i>Leesburg</i>	<ul style="list-style-type: none"> • Policies 1.1.1/1.3.2: Drainage/Elevation (Flooding) • Policy 1.3.3: Floodplain Conservation (Flooding) • Policies 1.2.1.9/1.3.3/Obj 1.4: Conservation (Flooding) • Policies 1.1.6/1.2.19/1.6.4/Obj. 1.7: Conservation (Erosion) • Policy 1.1.5: Land Use Conservation (Flooding/Drought)
<i>Mascotte</i>	<ul style="list-style-type: none"> • Policies 2.1.12/3.10.7/3.11.9/3.11.13/3.11.14: Land Use (Flooding) • Policies 1.2.9/Obj 1.6: Drainage (Flooding)

Jurisdiction	Policies
<i>Minneola</i>	<ul style="list-style-type: none"> • Policy 1.2.9: Chemicals (Flooding) • Section 98-12: Required easements and dedications. Drainage and Wetlands (Flooding)
<i>Montverde</i>	<ul style="list-style-type: none"> • Policies 101.24/5-1.2.13: Development (Sinkholes) • Policy 4-1.4.4: Septic (Flooding) • Policy 5-1.1.13: Development (Erosion)
<i>Mount Dora</i>	<ul style="list-style-type: none"> • Policies 2f/5f/7e: Floodplain Conservation (Flooding) • Policies 5e/2.2m: Land Use/Water (Sinkholes)
<i>Tavares</i>	<ul style="list-style-type: none"> • Policies 1-1.1.3/1-1.2.15/1-1.9.1: Floodplain Development (Flooding) • Policies 4-1.2.5/4-4.1/5-1.8.1: Floodplain/Sinkholes (Flooding) • Policies 5-1.2.10/5-1.8.6: Open Space (Sinkholes) • Policy 5-1.2.8: Shoreline (Erosion)
<i>Umatilla</i>	<ul style="list-style-type: none"> • Policies 5-1.83/5-1.81: Floodplain Preservation (Flooding/Sinkholes) • Policy 1-1.2.2: Development (Flooding)

The Villages although listed as a municipality is actually a special taxing district and does not have any plans, ordinances, etc. of their own as they follow the Lake County Building Codes and related policies, Fire Safety Codes, and Florida Building Codes as they may apply.

The municipalities utilize the approved LMS in connection with their own plans and procedures to further mitigation efforts working closely with the county to continue making all of Lake County resilient to the hazards identified.

While the majority of the planning efforts are aimed at flooding mitigation it is recognized that all hazards should be considered when revising plans and policies especially concerning land use, floodplain management, stormwater, development, etc. The LMS is adopted by all municipalities in Lake County and individual municipal and county-wide plans take mitigation efforts into consideration when making revisions.

Through upcoming meetings that will be taking place with jurisdictions to adopt the Lake County LMS, further integration of the LMS with their respective planning mechanisms will be discussed and encouraged to promote further continuity. Staff from the various organizations responsible for these individual plans will continue communicating with each other to further the process of better integrating these plans and improving overall dialogue about mitigation.

IX. AUTHORITIES AND REFERENCES

Code of Federal Regulations Title 44 201.6. *Local Mitigation Plans*. <http://www.ecfr.gov/cgi-bin/text-idx?rgn=div5&node=44:1.0.1.4.53>

FEMA (2011, Oct 1). *Local Mitigation Plan Review Guidance*, www.fema.gov:
http://www.fema.gov/media-library-data/20130726-1809-25045-7498/plan_review_guide_final_9_30_11.pdf

Florida Administrative Code 27P-22. *Hazard Mitigation Grant Program*,
<https://www.flrules.org/gateway/ChapterHome.asp?Chapter=27P-22>

Florida Statutes. *Chapter 252 Emergency Management*.
http://www.leg.state.fl.us/STATUTES/index.cfm?App_mode=Display_Index&Title_Request=XVII#TitleXVII

FEMA. *The Stafford Act*. http://www.fema.gov/media-library-data/1383153669955-21f970b19e8eaa67087b7da9f4af706e/stafford_act_booklet_042213_508e.pdf

APPENDIX I: ATTACHED SUBAPPENDICES

Maps, graphs, charts, tables, diagrams, and other additional data that provide support for the information presented in the LMS Plan are located in attachment Appendices A thru E.

Table 19: List of Appendices

SUBAPPENDIX	CONTENT
A	BYLAWS
B	LETTERS AND ADS
C	MEETING DOCUMENTATION
D	MEMBERSHIP
E	PROJECTS

APPENDIX II: LMS WORKING GROUP BY-LAWS AND MEMBERSHIP

ARTICLE I. PURPOSES OF THE WORKING GROUP

The purpose of the Lake County Local Mitigation Strategy (LMS) Working Group is to decrease the vulnerability of the citizens, governments, businesses and institutions of Lake County to the future human, economic and environmental costs of natural, technological, and societal disasters. The Working Group will develop, monitor, implement, and maintain a comprehensive plan for hazard mitigation which will be intended to accomplish this purpose.

ARTICLE II. MEMBERSHIP

Participation in the Lake County LMS Working Group is voluntary by all entities. Membership in the Working Group is open to all jurisdictions, organizations and individuals supporting its purposes.

ARTICLE III. ORGANIZATIONAL STRUCTURE

The organizational structure of the Lake County LMS Working Group shall consist of the Working Group and other subcommittees which may from time to time be created as needed by the Lake County Working Group. The Working Group shall have a Chair, and a Vice-Chair. Any member is eligible for election to one of these positions. The Lake County Office of Emergency Management will perform administrative functions for the Working Group as required by State of Florida Emergency Management Scope of Work.

A. The Lake County LMS Working Group

The LMS Chair will preside at each meeting of the Working Group, as well as establish temporary subcommittees and assign personnel to them. The Vice-Chair will fulfill the duties and responsibilities of the chair in their absence.

The Lake County LMS Working Group will consist of the designated representatives from the following:

- One representative or designee from the government of Lake County and;
- One representative or designee of each participating incorporated municipality and;
- Representatives from organizations and associations representing key business industry, and community interest groups of Lake County and;
- Representatives from other governmental entities and;
- Representatives of non-profit organizations and/or faith-based institutions and;

Members of the Lake County LMS Working Group will be coordinated by the Chair or Vice-Chair to serve as the official representative and spokesperson for the jurisdiction or organization regarding the activities and decisions of the Lake County LMS Working Group. Each jurisdiction or organization shall also appoint an alternate to their primary representative. The alternate shall have full voting rights in the absence of the primary representative. Each municipality and Lake County will hold one vote in taking actions on behalf of their entities as long as they remain a member in good standing. To maintain good standing, members of the Lake County LMS Working Group must not have more than two (2) consecutive absences at scheduled meetings. At this

time, their vote will be withheld from the representative until they attend two (2) consecutive meetings. Their voting rights will be reinstated at the third (3) consecutive meeting. Mitigating or extenuating circumstances will be addressed by the Chair or Vice-Chair as appropriate on behalf of the Lake County LMS Working Group. Two consecutive absences can also occur in failure to vote by electronic (email or web-hosted service) voting procedures that may be utilized from time to time in place of formal meetings.

D. Committees

The Lake County LMS Working Group shall establish subcommittees at any time for any special purposes. The membership of the committees shall be appointed by the Chair or Vice-Chair of the Lake County LMS Working Group, who shall also designate the subcommittee Chair. Membership shall be unlimited and is open to all interested jurisdictions, organizations and individuals.

E. Program Staff

The Lake County Office of Emergency Management will serve as the program staff for the Lake County Working Group, and assist in the coordination and support of the Lake County LMS Working Group activities.

ARTICLE IV. OFFICERS

Any member in good standing of the Lake County LMS Working Group is eligible for election as an officer. The Lake County LMS Working Group will have a Chair and Vice-Chair elected by a majority vote of a quorum of the members present. Each shall serve a term of one year and be eligible for re-election for an unlimited number of terms. A quorum shall consist of designated representative or alternate from at least five (5) of the participating jurisdictions in good standing.

The Chair of the Lake County LMS Working Group will preside at each meeting of the Lake County Working Group. The Vice-Chair will fulfill the duties and responsibilities of the Chair in their absence. Administrative functions will be handled by the Lake County Office of Emergency Management in accordance with Federal and State regulations.

ARTICLE V. RESPONSIBILITIES

A. The Lake County LMS Working Group

All responsibilities of the LMS Working Group shall be specified by Chapter 27P-22.004 and 27P-22.005, Florida Administrative Code (FAC). These rules are authorized under Florida Statute 252. The Lake County LMS Working Group will be responsible for all actions and decisions made formally in the name of the Lake County LMS Working Group.

a) Subcommittees

The responsibilities of subcommittees will be defined at the time they are established by the Chair of the Lake County LMS Working Group, or the voting members in good standing.

ARTICLE VI. ACTIONS BY THE WORKING GROUP

A. Authority for Actions

Only the Working Group has the authority to take final actions. Actions by subcommittees or program staff are not considered final until affirmed by action of the Lake County LMS Working Group.

B. Meetings, Voting and Quorum

Meetings of the Lake County LMS Working Group and its subcommittees will be conducted in accord with Robert's Rules of Order, when deemed necessary by Chair of the meeting. Regular meetings of the LMS Working Group will be scheduled at least annually with a minimum of 10 working days' notice. Committees will meet as deemed necessary by the Chair or Vice-Chair. Meetings can be held via a conferencing mechanism provided a means of recording attendance and voting can be done.

All final actions and decisions in the name of the Lake County LMS Working Group will be by affirmative vote of a quorum of the voting members present. A quorum shall consist of designated representative or alternate from at least five (5) of the participating jurisdictions. Each member of Working Group will have one (1) vote.

C. Emergency Actions by the Office of Emergency Management

The Lake County Office of Emergency Management is authorized to apply for grants, accept grants, create projects, approve projects, execute contracts and other actions consistent with the intent of public safety without the authorization of the LMS Working Group when, in the opinion of the Office of Emergency Management Manager, such expeditious action is necessary and consistent with the purpose stated in Article I. All applications, grant acceptances actions, project creations, project approvals under the section shall be authorized directly by the Office of Emergency Management Manager. The Chair or Vice-Chair of the LMS shall be informed of such action as soon as reasonably possible. All actions taken under this section shall be reported to the LMS Working Group at the next LMS Working Group meeting under new business.

a) Special Votes

Special votes may be taken under emergency situations or when there are other extenuating circumstances that are judged by both the Chair and Vice-Chair of the Lake County LMS Working Group or the Office of Emergency Management to prohibit scheduling of a regular meeting of the Lake County LMS Working Group. Special votes may be by telephone, electronic medium (email and/or web-hosted service with conference call capabilities), first class mail, and shall be in accord with all applicable statutes for such actions.

b) Public Hearings

When required by statute or the policies of Lake County, or when deemed necessary by the Lake County Working Group, a public hearing regarding actions under consideration for implementation by the Working Group will be held.

c) Documentation of Actions

All meetings and other forms of action by the Lake County LMS Working Group and subcommittees will be documented and made available for inspection by the public.

ARTICLE VII. ADOPTION OF AND AMENDMENTS TO THE BYLAWS

The Bylaws of the Lake County Working Group may be adopted and/or amended by a quorum of a designated representative or alternate from at least five (5) of the participating jurisdictions. Each member of Working Group will have one (1) vote. All proposed changes to the bylaws will be provided to each member of the Lake County LMS Working Group not less than ten (10) working days prior to such a vote.

ARTICLE VIII. DISSOLUTION OF THE WORKING GROUP

The Lake County LMS Working Group may be dissolved by affirmative vote of 100% of the attending quorum, by order of a court of competent jurisdiction, and/or by instruction of the Lake County governing body. At the time of dissolution, all remaining documents, records, equipment, and supplies belonging to the Lake County LMS Working Group will be transferred to the Lake County Office of Emergency Management for disposition.

Table 20: Lake County LMS Task Force Membership

Member Name	Position	Jurisdiction or Entity and Position
<i>Poniatowski, Michael</i>	Emergency Operations Manager	AdventHealth Waterman Hospital
<i>Wells, Graham</i>	Town Manager	Town of Astatula
<i>Echols, Dustin</i>	Member Relations Representative	Clay Electric
<i>Harrison, William</i>	Deputy Fire Chief	City of Clermont
<i>Pierce, Jennifer</i>	Fire Inspector	City of Clermont
<i>Butler, Paul</i>	Deputy Administrator	Florida Department of Health in Lake County
<i>Kissler, Aaron</i>	Administrator	Florida Department of Health in Lake County
<i>Milanese, Megan</i>	Government Operations Consultant II	Florida Department of Health in Lake County
<i>Calhoun, Gary</i>	Police Chief	City of Eustis
<i>Swanson, Michael</i>	Fire Chief - Chairman	City of Eustis
<i>Cribb, Roy</i>	Lake County Fire Service Area Supervisor	Florida Fire Service
<i>Tear, Judith</i>	Wildlife Mitigation Specialist & PIO	Florida Fire Service
<i>Dicus, Robb</i>	Public Works Director	City of Fruitland Park
<i>LaVenia, Gary</i>	City Manager	City of Fruitland Park
<i>Walsh, Josh</i>	Fire Captain	City of Groveland
<i>Chester, Larry</i>	Police Officer	Town of Howey-in-the-Hills
<i>Roman, Rich</i>	Police Officer	Town of Howey-in-the-Hills
<i>Thomas, Rick</i>	Police Chief	Town of Howey-in-the-Hills
<i>Tempsta, Robert</i>	Police Chief	Town of Lady Lake
<i>Carpenter, Thomas</i>	Director of Emergency Management	Lake County Board of County Commissioners
<i>Cates, Morgan</i>	Stormwater Team Leader	Lake County Board of County Commissioners
<i>Dickerson, Jim</i>	Fire Chief	Lake County Board of County Commissioners
<i>Earhart, Jeff</i>	Deputy Director, Public Works	Lake County Board of County Commissioners
<i>Gobel, Larry</i>	Traffic Operations Supervisor	Lake County Board of County Commissioners
<i>Hamilton, Mary</i>	Chief of Public Works Operations	Lake County Board of County Commissioners
<i>Johnson, Jeff</i>	Roads Superintendent	Lake County Board of County Commissioners

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<i>Kostus, Spencer</i>	Deputy Director, Emergency Management	Lake County Board of County Commissioners
<i>Marchese, Deb</i>	Construction Program Specialist	Lake County Board of County Commissioners
<i>Mcray, Nick</i>	Operations Manager, Public Works	Lake County Board of County Commissioners
<i>Molenda, John</i>	Deputy County Manager	Lake County Board of County Commissioners
<i>Schneider, Fred</i>	Director of Public Works	Lake County Board of County Commissioners
<i>Sievert, Chris</i>	Deputy Fire Chief	Lake County Board of County Commissioners
<i>Smith, Jerry</i>	Director, Emergency Medical Services	Lake County Board of County Commissioners
<i>Van Alstine, Randy</i>	Transit Supervisor – LMS Coordinator	Lake County Board of County Commissioners
<i>Peebles, Peter</i>	Residential Appraisal	Lake County Property Appraiser’s Office
<i>Carr, John</i>	Assistant Superintendent - Operations	Lake County Schools
<i>DeRidder, Lauren</i>	Supervisor of Risk Management	Lake County Schools
<i>Mabry, Joseph</i>	Safety & Security State Reporting Specialist	Lake County Schools
<i>McDuffie, Ralph</i>	Lieutenant	Lake County Sheriff’s Office
<i>Hart, Ron</i>	Executive Director	Lake County Water Authority
<i>Craine, Darrell</i>	Deputy Director, Public Works	City of Leesburg
<i>Johnson, David</i>	Fire Chief	City of Leesburg
<i>Kelsey, Clifford</i>	Director, Public Works	City of Leesburg
<i>Jolliff, John</i>	Emergency Management Representative	LifePointe Church, Eustis
<i>Brasher, Randy</i>	Fire Chief	City of Mascotte
<i>Walker, Larry</i>	Public Works Director	City of Mascotte
<i>Donofrio, David</i>	CRA Manager / Accountant	City of Minneola
<i>Otero, Jan</i>	Fire Chief	City of Minneola
<i>Miller, Fred</i>	Public Works Superintendent	City of Minneola
<i>Nilson, Vaughn</i>	Director of Public Works	Town of Montverde
<i>Griner, Tim</i>	Fire Chief	City of Mount Dora
<i>Hand, Ethan</i>	Utilities Engineer	City of Mount Dora

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<i>Lahr, Paul</i>	City Engineer	City of Mount Dora
<i>Langley, Steve</i>	Director of Electric Utilities	City of Mount Dora
<i>Marek, George</i>	Sr. Project Manager - Engineer	City of Mount Dora
<i>King, Stacy</i>	Corporate Emergency Preparedness Specialist	Orlando Health
<i>Hamstra, David</i>	Consultant	Pegasus Engineering
<i>Davis, Susan</i>	Intergovernmental Affairs Program	St. Johns River Water Management
<i>Clark, Phillip</i>	Director of Utilities	City of Tavares
<i>Dillon, James</i>	Director of Public Works	City of Tavares
<i>Keith, Richard</i>	Fire Chief – Vice Chair	City of Tavares
<i>Luckock, Buddy</i>	Fire Captain	City of Tavares
<i>Mercer, Aaron</i>	Director of Public Works	City of Umatilla
<i>Bean, Blair</i>	Director, District Property Management	The Villages Community Development District
<i>Baier, Richard</i>	District Manager	The Villages Community Development District
<i>Devlin, Jeanue</i>	District Manager	The Villages Community Development District
<i>Longacre, John</i>	Lieutenant, Emergency Management	The Villages Community Development District
<i>Tucker, Diane</i>	Administrative Operations Manager	The Villages Community Development District
<i>Wartinbee, Sam</i>	Direct, District Property Management	The Villages Community Development District
<i>Wilson, Brittany</i>	Director of Technology and Board Support	The Villages Community Development District

APPENDIX III: MAPS AND FIGURES

Figure 12: General Flood Zones for Lake County, FL

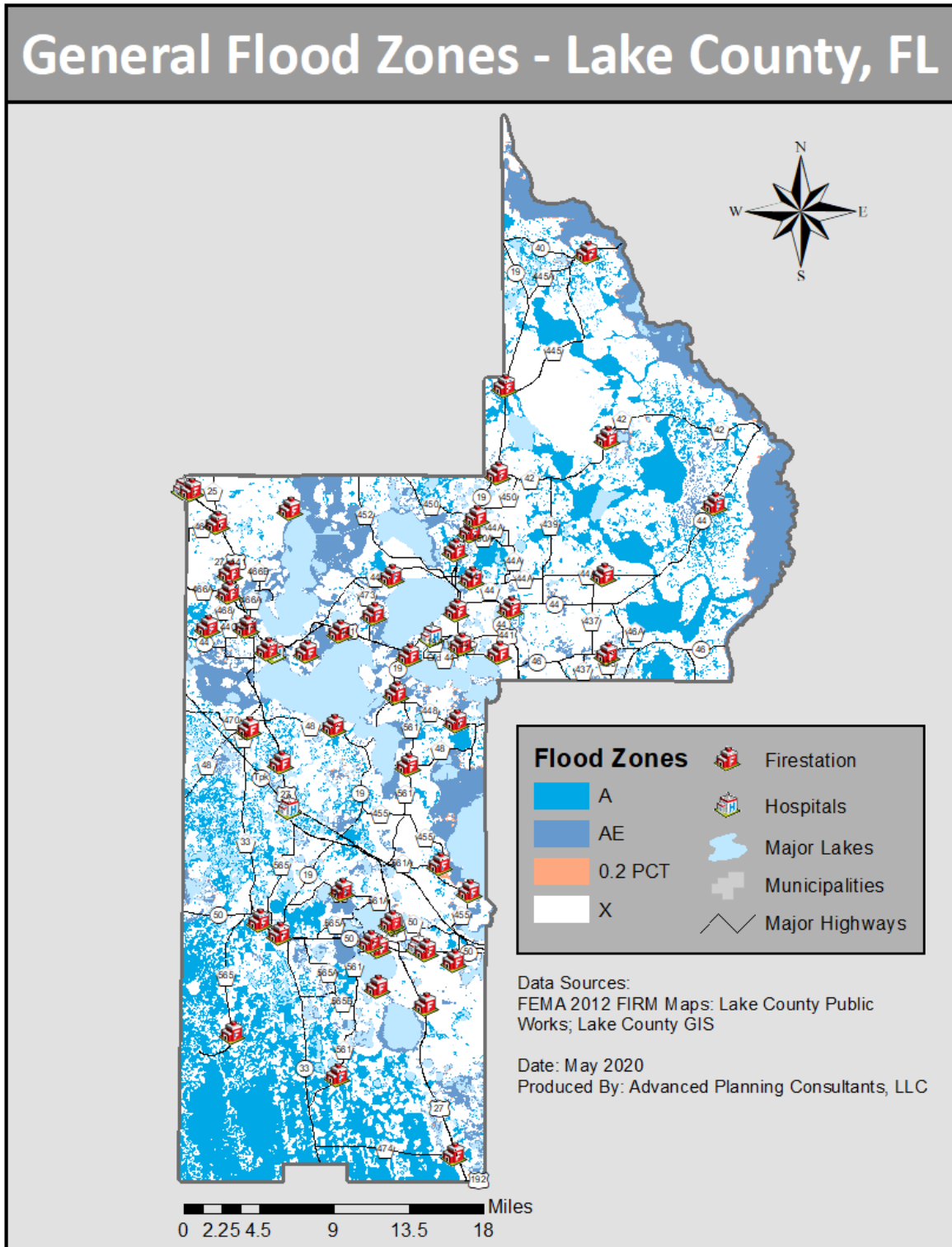
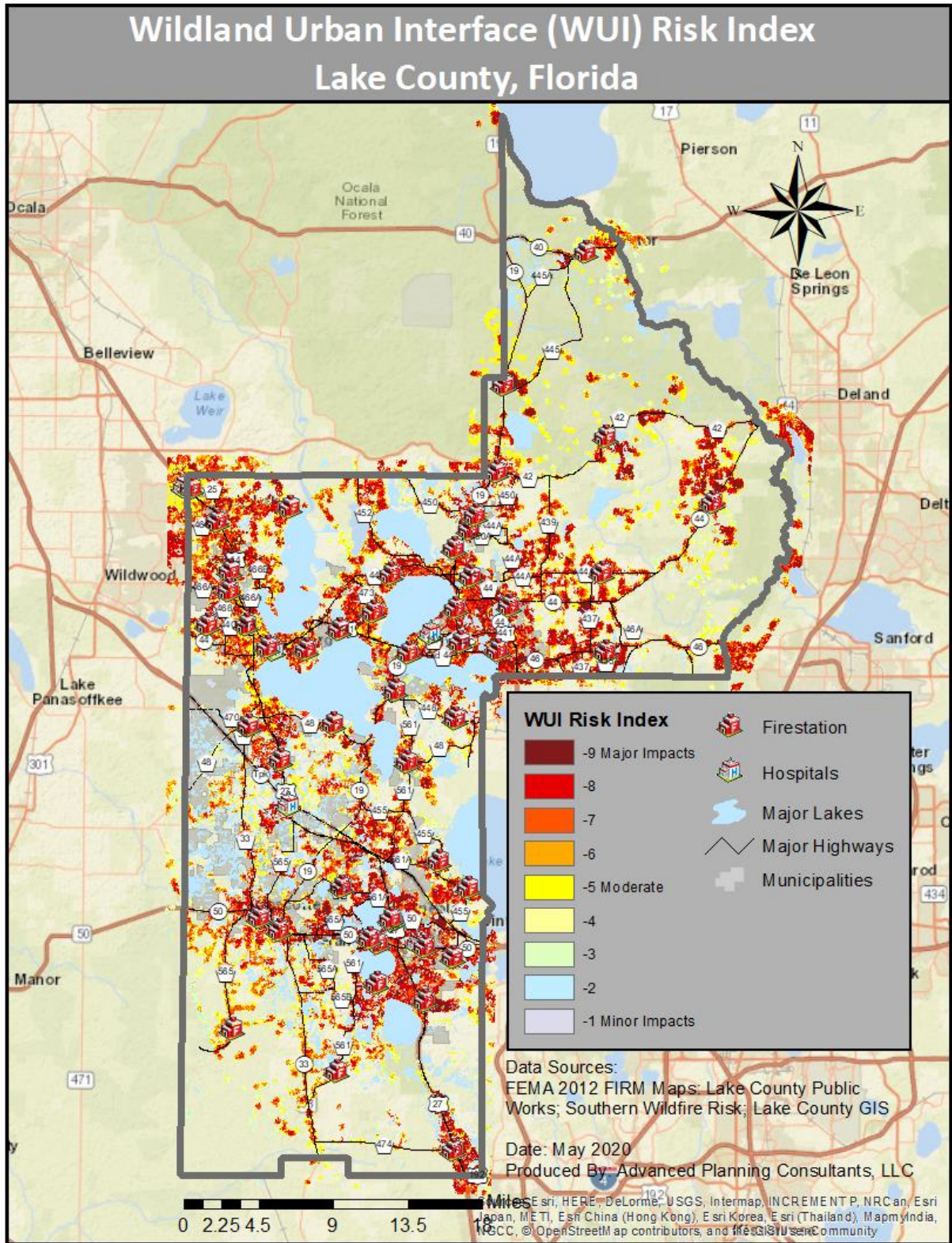


Figure 13: Wildland Urban Interface (WUI) Risk Index for Lake County, Florida.



RESOLUTION NO. 2021- 19

A RESOLUTION OF THE BOARD OF COUNTY COMMISSIONERS OF LAKE COUNTY, FLORIDA, ADOPTING THE LAKE COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, the Florida Division of Emergency Management and the Federal Emergency Management Agency recommends that all local governments, in cooperation with their local county emergency management agency, develop and maintain a Hazard Mitigation Plan; and

WHEREAS, Lake County desires to have and maintain this plan to protect the life and property of its citizens; and

WHEREAS, Lake County, in cooperation with the municipalities of Lake County has developed the plan, policies and procedures necessary to plan and develop projects to protect the citizens of Lake County from hazards.

NOW, THEREFORE, BE IT RESOLVED by the Board of County Commissioners of Lake County, Florida that Lake County adopts the proposed Lake County Multi-Jurisdictional Hazard Mitigation Plan, dated February 9, 2021, identifying the hazards and strategies to mitigate those hazards.

1. The above recitals are incorporated herein.
2. This Resolution shall become effective upon its passage and adoption according to law.

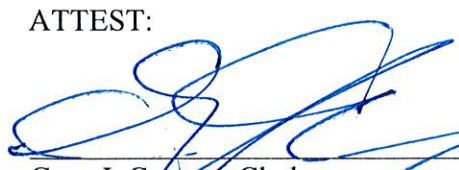
PASSED AND ADOPTED this 9 day of February, 2021.

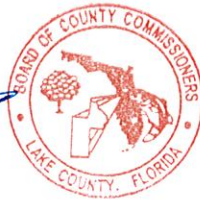
BOARD OF COUNTY COMMISSIONERS
LAKE COUNTY, FLORIDA


Sean M. Parks, Chairman


This 9 day of February, 2021.

ATTEST:


Gary J. Cooney, Clerk
Board of County Commissioners
of Lake County, Florida



Approved as to form and legality:


Melanie Marsh, County Attorney



STATE OF FLORIDA

DIVISION OF EMERGENCY MANAGEMENT

Ron DeSantis
Governor

Jared Moskowitz
Director

November 18, 2020

Thomas Carpenter, Director
Lake County Emergency Management
425 West Alfred Street,
Tavares, Florida 32778

Re: Lake County Local Hazard Mitigation Plan Approved Pending Adoption

Dear Director Carpenter,

This is to confirm that we have completed a State review of the Lake County Local Mitigation Strategy (LMS) update for compliance with the federal hazard mitigation planning standards contained in 44 CFR 201.6(b)-(d). Based on our review and comments, Lake County developed and submitted all the necessary plan revisions and our staff has reviewed and approved these revisions. We have determined that the Lake County LMS plan is compliant with federal standards, subject to formal community adoption, for the jurisdictions below:

Lake County, Unincorporated
Town of Astatula
City of Clermont
City of Eustis
City of Fruitland Park
City of Groveland
Town of Howey-in-the-Hills
Town of Lady Lake

City of Leesburg
City of Mascotte
City of Minneola
Town of Montverde
City of Mount Dora
City of Tavares
City of Umatilla
Villages Community Development District

Upon submittal of a copy of all participating jurisdictions' documentation of their adoption resolutions to our office, we will send all necessary documentation to the Federal Emergency Management Agency (FEMA) who will issue formal approval of the Lake County LMS.

If you have any questions regarding this matter, please contact your LMS Liaison Kristin Buckingham at Kristin.Buckingham@em.myflorida.com or 850-815-4519.

Respectfully,

Miles E. Anderson

Digitally signed by Miles E. Anderson
DN: cn=Miles E. Anderson, o=DEM, ou=Mitigation,
email=Miles.anderson@em.myflorida.com, c=US
Date: 2020.11.20 10:06:35 -05'00'

Miles E. Anderson,
Bureau Chief, Mitigation

State Hazard Mitigation Officer

MEA/kb

Attachments: MEMORADUM: State approval of LMS plans under Program Administration by States (PAS)

cc: FEMA Region IV, Mitigation Division – Risk Analysis Branch

Lake County Local Mitigation Strategy (LMS)

2020 Update – Summary of Changes

Change	Comments/Purpose	Date	Pages
Plan Update	Plan was updated and revised in entirety to meet current FDEM/FEMA criteria	2020	All
Improve Flow/Readability; Remove Redundancies	Document was streamlined to improve flow and readability, in addition to eliminating redundancies	2020	All
Introduction	Minor updates to the introduction sections	2020	Pg. 1-4
Summary Potential Hazard Impact to Locality	Added Potential Hazard Impact to Locality	2020	Pg. 9
Risk Assessment/ Vulnerability	Combined some Risk Assessment and Vulnerability elements into Hazard Profiles; Each hazard addresses: Description; Location and Extent; Previous Occurrences; Probability; Vulnerability/Risk Assessment	2020	Pg. 5-62
Previous Occurrences and Risk/ Vulnerability Assessment	Using the most recent and best available data, updated the Occurrences and Risk/ Vulnerability Assessment for each hazard	2020	Pg. 5-62
Vulnerability Assessment Methodology and Conclusions	Updated Repetitive Loss Properties and Land Use Trends	2020	Pg. 62-64
Membership	Membership for the Working Group was reviewed and revised	2020	Appendix I-D
Project List	Project List was updated	2020	Appendix I-E
Meeting Documentation	Meeting documentation was added for meetings held since last revision	2020	Appendix I-C