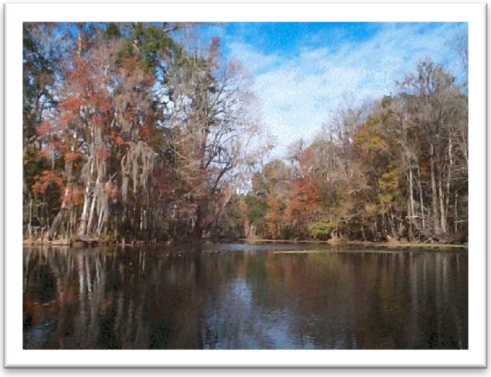
Union County

Local Mitigation Strategy Plan 2020



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According to Title 44 CFR §201.1, the purpose of mitigation planning is for State, local, and Indian tribal governments to identify the natural hazards that impact them, to identify actions and activities to reduce any losses from those hazards, and to establish a coordinated process to implement the plan, taking advantage of a wide range of resources.

Hazard mitigation is any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards, Title 44 CFR §201.2. The mitigation initiatives or activities may be implemented prior to, during, or after an event. It has been noted that hazard mitigation is most effective when based on an inclusive, comprehensive, long-term plan that is developed before a disaster occurs.

The Union County Local Mitigation Strategy (LMS) details the continual work of the Union County LMS Working Group (WG) over the past several years to develop the comprehensive planning process and an analysis on the risks posed by natural disasters and their vulnerability, extent and impact to those risks. After reviewing risks and vulnerabilities, the greater community has agreed upon mitigation goals, objectives and measures intended to reduce, or in some cases, eliminate future losses due to these risks.

This local mitigation strategy seeks to accomplish the following:

- ✓ Identify and describe hazards to which Union County is vulnerable;
- ✓ Identify and assess the facilities, structures and other assets within Union County that are most vulnerable to particular hazards;
- ✓ Set goals and objectives as a strategy to mitigate property against future losses;
- ✓ Based upon these goals and objectives, identify and prioritize mitigation projects that will take advantage of available funding and reduce future losses;
- ✓ Identify potential funding sources; and
- ✓ Promote hazard risk awareness and mitigation education.

Union County is threatened by a number of different types of natural hazards (i.e. flooding, sinkholes, hurricanes and tropical storms, tornadoes, thunderstorms, strong winds, hail, lightning, riverine erosion, wildfires, drought, heat wave, winter storms, and freezing temperatures). These hazards endanger the health and safety of the population of the county, jeopardizing its economic vitality, and imperil the quality of its environment.

Extensive research and analysis has been performed to identify the hazards threatening the jurisdictions of Lake Butler, Worthington Springs, Raiford and unincorporated Union County to estimate the relative risks posed to the community by those hazards.

This study has been used by the Working Group members to assess the vulnerabilities of the facilities and jurisdictions of Union County to the impacts of future disasters involving those hazards. With these identified, the WG has worked to identify proposed mitigation projects or initiatives that will avoid or minimize these vulnerabilities and to make the communities of Union County much more resistant to the impacts of future disasters. The proposed projects have been

identified and developed and will continue to be evaluated by the Working Group for implementation whenever the financial resources become available.

The mitigation project list is considered a "living document". The project list will and should evolve as projects are undertaken and completed, as future disasters affect the county and new needs are identified, and as local priorities change. As the mitigation projects identified in this plan are implemented, step-by-step, Union County will become a more "disaster resistant" community.

The Federal Emergency Management Agency (FEMA) and the Florida Division of Emergency Management (FDEM) require that this document be adopted by the following governing bodies; City of Lake Butler, the Town of Worthington Springs, the Town of Raiford, and unincorporated Union County. Adoption of the Union County LMS by the City and County Commissions will not have any legal effect on the Comprehensive Plan or any other legally binding documents. However, adoption of the LMS will give the County and its jurisdictions priority with respect to funding for disaster recovery and hazard mitigation from state and federal sources.

Through publication of this LMS plan, the Working Group continues to solicit the involvement of the entire community to make the people, neighborhoods, businesses, and institutions of Union County safer from the impacts of disaster events.

Plan Organization

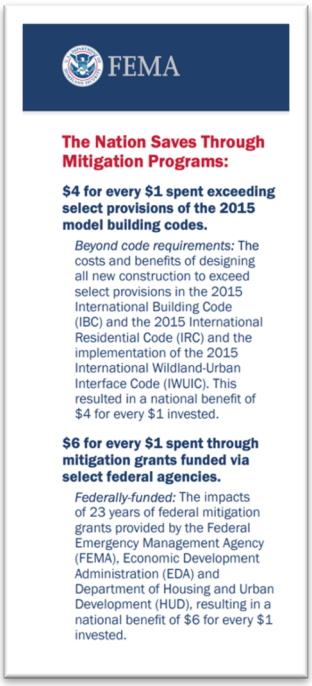
Union County's Local Mitigation Strategy Plan is organized into the following sections and appendices:

Section 1	Introduction
Section 2	Planning Process
Section 3	Union County Profile
Section 4	Hazard Risk and Vulnerability Assessment
Section 5	Mitigation Strategy
Section 6	Plan Evaluation and Maintenance
Appendix A	LMS Working Group Meeting Documentation
Appendix B	LMS Projects or Initiatives
Appendix C	Union County Community Wildfire Protection Plan

Section 1 – Introduction

Figure 1.1 – Nation Saves through Mitigation Programs

As stated by FEMA, see Figure 1.1 to the right, the nation saves $4 for every $1 spent on mitigation programs. And, $6 for every $1 spent through mitigation grants funded.



An effective natural hazard mitigation plan and program would save the County and is essential in reducing the risk of loss of life and property from future disasters.

Every community is exposed to some level of risk from hazards and hazards cannot be eliminated, but it is possible to determine what hazards will affect the county communities, where they are most severe, and identify mitigation projects or initiatives that can be taken to reduce the severity of the hazard.

As previously noted, mitigation is any action taken to permanently reduce or eliminate long-term risk to people and their property from the effects of hazards.

Examples of mitigation projects for Union County might include:

✓Purchase generators for several critical facilities;
✓Build and construct a new critical facility to serve the residents of the county;
✓Set up security system for the communications tower;
✓Wind retrofit critical facilities that provide essential services; and
✓Retrofit existing structures to meet new building codes and standards.

Image Source: https://www.fema.gov/media-library-data/1528727738945-e9805d8703ed4a1b02c5e2861b7ac65a/MitigationSaves_FEMA_180611_508.pdf

Ideally, a community can minimize the effects of future hazards through a mix of code enforcement, planning, and responsible development.

The County's critical facilities are those facilities necessary for a community's response and recovery from a hazard event. Categories for Union County's critical facilities would include: sheriff's office, dispatch center, emergency operations center, emergency medical services and storage, fire departments and stations, wastewater treatment plant, water treatment plants, lift stations, solid waste centers, water well and tank, radio and communication towers, county health department, hospital, medical center, dental, dialysis, public schools, school board, point of distribution centers, disaster recovery centers, special needs, general and risk shelters, transport and transportation, community resources, mobile home/RV parks, energy, and the county jail and prisons should not be placed in high hazard areas because the

function these facilities provide are too valuable to be placed in jeopardy, especially during times of disaster, and are essential to the well-being of the community served by these systems.

The community infrastructure such as bridges, roads, drainage structures, sewer lines, electric lines, telephone lines that are built in high hazard areas are subject to frequent damage and extremely costly repair. And, if a local government belongs to the National Flood Insurance Program (NFIP) and allows development in the floodplain without proper elevation and construction techniques, the federal government can withdraw the community's access to federal flood insurance for both public and private structures. Furthermore, a local government is responsible for as much as 12.5% of their local public cost of a federally declared disaster and 100% of any damage from smaller events that are not declared disasters. These costs can put a significant strain on the local government budget.

The goal of having an established Local Mitigation Strategy (LMS) as an ongoing process will make hazard mitigation part of the daily functioning life in Union County. It serves as a bridge between local governments' programs, plans, and policies including but not limited to the comprehensive growth management plan, comprehensive emergency management plan, land development regulations, building codes and ordinances for effective floodplain management.

Over the last 30+ years, FEMA and the United States Congress have witnessed substantial increases in disaster response and recovery costs; as a result, they have provided funds to communities, counties, and states to reduce impacts from natural hazards through hazard mitigation. This marked a fundamental shift in policy; rather than placing primary emphasis on response and recovery, FEMA's focus broadened to incorporate mitigation as the foundation of emergency management.

The Union County LMS Working Group prepares the community, the businesses and institutions in becoming more resistant to the impacts of future disasters by evaluating the exposure of the community to all types of future natural hazards in order to identify ways to make the county more resistant to their impacts. This document reports the results of that planning process for the current planning period.

The Union County LMS is intended by the Working Group to serve many purposes. These include the following:

Structured planning concepts in a methodical process to identify vulnerabilities to future disasters and to propose the mitigation projects necessary to avoid or minimize exposure. Each step in the planning process builds upon the previous process so that there is a higher level of assurance that the mitigation projects proposed by the participants have a valid basis for both their justification and priority for implementation. It is then an important element for the LMS plan is to document that process and to present its results to the community.

Continual search for new ways to make the community as a whole more aware of the natural hazards that threaten the public health and safety, the economic vitality of businesses, and the operational capability of important institutions.

Providing details on specific vulnerabilities of the neighborhoods of Union County and many of the facilities that are important to the community's daily life. This information will be very helpful to individuals that wish to understand how the community could become safer from the impacts of future disasters.

The Working Group continues to seek new opportunities and ideas to provide information and education to the public regarding ways to be more protected from the impacts of future disasters. The County has been active in communicating with the public and engaging interested members of the community in the planning process. This document, and the analyses contained herein, is the principal information resource for this activity. The Union County Sheriff's Office of Emergency Management has an active Facebook page to connect with the community residents:

https://www.facebook.com/unionsheriff/

Furnish the required information needed by the managers and leaders of local government, business and industry, community associations, and other key institutions and organizations to take actions to address vulnerabilities to future disasters. In addition, it provides proposals for specific mitigation projects or initiatives and programs that are needed to eliminate or minimize those vulnerabilities.

These mitigation projects have been justified on the basis of their economic benefits using a uniform technical analysis, as well as prioritization for implementation utilizing a selected criteria approach. This path is intended to provide a decision tool for the management of participating organizations and agencies regarding why the proposed mitigation should be implemented, which should be implemented first, and the economic and public welfare benefits of doing so.

A key purpose of the planning process utilized by the Union County Working Group is to ensure that proposals for mitigation projects are reviewed and coordinated among the participating jurisdictions within the county. These projects can be adopted and implemented for the jurisdiction's own purposes and on its own schedule. In this way, the format of the plan and the operational concept of the planning process ensure that proposed mitigation projects are coordinated and prioritized effectively among jurisdictions, while nonetheless allowing each jurisdiction to adopt only the proposed projects that it actually has the authority or responsibility to implement when resources are available.

The planning process used by the LMS WG meets the analysis and documentation needs of the planning process. The plan utilizes technical analysis and the formulation of proposed mitigation projects for incorporation into this plan.

The following sections of the Union County LMS present the detailed information to support these objectives. In addition, it documents the structural and non-structural mitigation projects proposed by the participating jurisdictions to address the identified exposure. The plan will also address the goals and objectives of the Working Group for the next planning period, during which this plan will continue to be expanded and refined.

Section 2 - Planning Process

Requirements:

§201.6 (c) (1) - The plan shall include documentation of the planning process used to develop the plan, including how it was prepared, who was involved in the process for each jurisdiction, and how the public was involved.

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

§201.6 (b) (1) - An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval.

§201.6 (b) (3) - Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

§201.6 (c) (4) (iii) - Discussion on how the community will continue public participation in the plan maintenance process.

The Union County LMS is a local community product, which was developed by the LMS Working Group to be in compliance with the DMA 2000 requirements, and currently in 2020 for the 5-year required update. The present LMS plan will expire 4/15/2021. The final draft of the 2020 updated plan will be submitted to the State of Florida by October 15, 2020 for review and approval.

The Union County Emergency Management Department initiated the LMS planning process by hiring consultants to author the updated LMS plan. Facilitated by the consultant, the EM Department and the Working Group worked together to engage local agencies and community members in the planning process. The LMS working group engaged local agencies, community members, neighboring communities, regional agencies and the public to be involved in the planning process, beginning in early 2020. At the annual 2020 LMS meeting, October 7, 2020, analysis and discussion occurred regarding the Mitigation Projects, the LMS Goals and Objectives and selected areas on the update for the LMS Plan. See LMS working group meetings listed below and all meeting documentation (i.e. meeting advertisements, sign-in sheets, current working group members, and meeting minutes) in Appendix A.

This section describes the organizational structure used to complete the public planning process.

Planning Area

There have been neither new municipalities created nor any dissolved since the last plan approval date. The planning area continues to include Union County (unincorporated), the City of Lake Butler, the Town of Worthington Springs, and the Town of Raiford.

Local Mitigation Strategy Working Group Members

The Union County LMS Working Group is made up of a number of local government agencies, regional agencies, representation from each jurisdiction, institutions, and neighboring jurisdictions.

The Union County LMS Working Group ***encourages participation*** by all interested local and neighboring jurisdictions, regional agencies, organizations, and individuals. Broad community representation is promoted in the Working Group and at public meetings to provide ample opportunity for public commentary and consideration of the local mitigation strategy.

The organization is intended to represent a partnership between the public and private sector of the community, working together to create a disaster resistant community. The proposed mitigation projects developed by the Working Group are listed in this plan in Appendix B. When the projects are implemented, they are intended to make the entire community safer from the impacts of future disasters, and will benefit every individual, neighborhood, business, and institution.

Members of many organizations were invited via e-mail correspondence to discuss the importance of participation on the Union County LMS Working Group. See copies of the available e-mail correspondence in Appendix A. Each jurisdiction was represented in the LMS Working Group (see Table 2.1). In addition, the Union County LMS Working Group benefited from the assistance and support of its many members.

Participation in the Working Group is not limited in any manner, and all members of the community, whether representing the public or private sector, are welcome to participate. ***The general public and neighboring communities are encouraged to become involved with the Union County Local Mitigation Strategy*** to gauge the plan effectiveness and help identify local hazards to be placed on the county project list. Cooperation from interested parties, including local/adjacent government representatives and citizens, is solicited via public meeting advertisements in the local County newspaper, and other online resources.

There were several opportunities to include the public citizens in the LMS planning:

- LMS Meeting Notices were listed on the County website, Public Notices:
  https://unioncounty-fl.gov/advertisements-notices-and-rfps/

- LMS Meeting Notices were published in the Union County Times:
  https://starkejournal.com/

- LMS Meeting Notices were announced at the County Commissioner's meetings.

- A copy of the LMS plan was advertised and available online for comments

There has been public participation from the community in previous year Union County LMS meetings. In addition, the press attends every LMS meeting and writes articles on how the community can participate in the mitigation activities

for the county's local mitigation strategy.

Public Involvement in the Drafting Stage of the LMS

Public involvement with the LMS is important to document. A copy of the 2020 LMS plan was available at the Union County Emergency Management office via plan download link. It provided the County citizens an opportunity to review the document and submit feedback to the EM director "prior to the final plan approval".

There was some feedback from the LMS Working Group on Section 4, Hazard Risk & Vulnerability Assessment. Updates were included in this final LMS Plan.

There was participation from the County residents and neighboring jurisdictions in the LMS meetings. In addition, those member organizations listed in Table 2.1 provided a great deal of support and assistance.

The LMS Working Group Chairman is Timothy Allen, Union County Emergency Management and the Assistant Chairman is Mark Hughes, Union County Emergency Management.

Table 2.1- 2020 Union County LMS Working Group Members

Union County Emergency Management/911	Timothy C. Allen, Director
Union County Emergency Management/Fire	Mark Hughes, Assistant Director, Fire Captain
Union County Emergency Management/911	Janell Graham, Assistant

Union County	James Williams, County Coordinator
City of Lake Butler	Dale M. Walker, City Manager
Union – Bradford Department of Health	Dan Mann, Operations & Management
Union County Road Department	Shelton Arnold, Director
Union County Solid Waste/Mosquito Control	Kim Hayes, Director
Town of Worthington Springs	Pat Harrell, Town Clerk
Town of Raiford	Lamar Griffis, Mayor
Lake Butler Hospital	Reagan Husong, Respiratory Therapist
Florida Forest Service	Doc Bloodworth, Wildfire Mitigation Specialist
Columbia County Emergency Management	Shayne Morgan, Director
Baker County Emergency Management	Bek Parker, Director
University of Florida/IFAS Extension	Luke Harlow, Union County Interim Director
The Management Experts	Traci Buzbee, Owner
The Management Experts	Gail Leek, Emergency Management Planner

LMS Working Group Meetings

Union County Emergency Management is the lead agency in scheduling and conducting the efforts of the Local Mitigation Strategy Working Group and is primarily responsible for updating the LMS plan. The LMS meetings were held at the Union County Department of Emergency Management office, 58 NW 1st Street, Lake Butler, FL and occurred in 2016; 2017; 2018, 2019 and via conference call in 2020.

See Appendix A for the meeting notices or advertisements, agendas, attendee sign-in sheets and meeting minutes.

Planning Procedures

The procedures used by the Union County LMS Working Group is based on the following important concepts:

- Organizes a comprehensive, multi-organizational, multi-jurisdictional planning group that establishes specific goals and objectives to address the community's vulnerabilities to all types of hazards.
- Establishes a planning schedule that allows participants to anticipate their involvement in the technical analysis and evaluations.
- It utilizes a logical, stepwise process of hazard identification, risk evaluation and vulnerability assessment, as well as analysis of past disaster events, that is consistently applied by all participants.

- Mitigation projects are proposed for incorporation into the plan only by those jurisdictions or organizations with the authorities and responsibilities for their implementation.
- The process encourages participants to propose specific mitigation projects that are feasible to implement and clearly directed at reducing specific vulnerabilities to future disasters.
- Proposed mitigation projects are characterized in a substantive manner, suitable for this level of planning, to assure their cost effectiveness and technical merit, as well as coordinated among jurisdictions to assure that conflicts or duplications are avoided.

The planning process begins with the development of the Working Group as an organization and obtaining participation from the local government jurisdictions and key organizations and institutions. The planning work conducted to develop this document relies heavily on the expertise and authorities of the participating agencies and organizations, rather than on detailed scientific or engineering studies. The Working Group is confident that the best judgment of the participating individuals, because of their role in the community, can achieve a level of detail in the analysis that is more than adequate for purposes of local mitigation planning.

Analyzing the need for the community and then formulating proposed mitigation projects to avoid or minimize vulnerability of the community to future disasters is an enormous effort, and an area that must be reviewed and addressed periodically. The goals and objectives set by the Working Group are intended to help focus the effort of the participants, for example, by directing attention to certain types of facilities or neighborhoods, or by emphasizing implementation of selected types of proposed mitigation projects.

The LMS Working Group is responsible for:

- ✓ Official decisions regarding the planning process;
- ✓ Determining the priority and approving the proposed mitigation project for each jurisdiction;
- ✓ Deleting projects that are no longer applicable for implementation; and
- ✓ Coordinating the technical analysis and planning activities.

These activities include conducting the hazard identification and vulnerability assessment processes, as well as receiving and coordinating the mitigation projects for incorporation into this plan.

Hazard Identification and Risk Estimation

The Working Group analyzes the natural hazards that threaten all or portions of the community. Where possible, specific geographic areas subject to the impacts of the identified hazards are delineated. Data is analyzed on previous occurrences for the natural hazards. In addition, the Working Group uses general information to estimate the relative risk of the various hazards as an additional method to focus their analysis and planning efforts. They compare the likelihood or probability that a hazard will impact an area, as well as the consequences of that impact to public health and safety, property, the economy, and the environment. This comparison of the consequences of an event with its probability of occurrence is a measure of the risk posed by that hazard to the community.

Depending on the participating jurisdiction, a variety of information is obtained regarding hazard identification and risk estimation. The planners representing the jurisdiction attempt to incorporate consideration of hazard specific maps, including flood plain delineation maps, whenever applicable, and GIS-based analyses of hazard areas and the locations of critical facilities, infrastructure components and other properties located within the defined hazard areas.

Estimating the relative risk of different hazards is followed by the assessment of the vulnerabilities in the likely areas of impact to the types of physical or operational agents potentially resulting from a hazard event.

Vulnerability Assessment

There are two methods available to the Working Group to assess the communities' vulnerabilities to future disasters.

- The first method is a methodical, qualitative examination of the vulnerabilities of important facilities, systems and neighborhoods to the impacts of future disasters. For the participating jurisdictions and organizations, the individuals most familiar with the facility, system or neighborhood through a guided, objective assessment process established by Working Group, complete the analysis and examination details.

  The process ranks both the hazards to which the facility, system or neighborhood is most vulnerable, as well as the consequences to the community should it be disrupted or damaged by a disaster. This process typically results in identification of specific vulnerabilities that can be addressed by specific mitigation projects that can be proposed and incorporated into this plan.

  As an associated process, the Working Group also reviews past experiences with disasters to see if those events highlighted the need for specific mitigation projects based on the type or location of damage they caused. Again, these experiences can result in the formulation and characterization of specific mitigation projects for incorporation into the plan.

- The second method for assessment of community vulnerabilities involves comparison of the existing policy, program and regulatory framework promulgated by local jurisdictions to control growth, development and facility operations in a manner that minimizes vulnerability to future disasters.

  The Working Group members can assess the individual jurisdictions' existing codes, regulations, plans, and programs to compare their provisions and requirements against the hazards posing the greatest risk to that community. If indicated, the participating jurisdiction can then propose development of additional codes, plans or policies as mitigation projects for incorporation into the Union County LMS for future implementation when it is appropriate to do so.

Review & Integration with Existing Plans

The LMS is intended to provide the local communities an opportunity to implement mitigation efforts across all planning documentation. In an attempt to integrate mitigation efforts across both the public and private domain, the LMS Working Group works to incorporate existing planning mechanisms into the LMS and to assure that the LMS is integrated into other mechanisms throughout the county.

Union County Emergency Management staff maintain the process for incorporating the Local Mitigation Strategy into other local government planning mechanisms. The County, the City of Lake Butler, the Town of Worthington Springs, and Town of Raiford plans, regulations, ordinances, and maps are carefully reviewed and integrated into the LMS as they undergo their regular updates. Many of the LMS Working Group members are also involved in the current update of the County's Comprehensive Plan and brings the LMS goals and objectives to the table of those efforts.

The County currently uses comprehensive and emergency management planning, capital improvement projects, building codes and ordinances to guide and control development throughout the County, and assists the city and town in this respect. The LMS Working Group recognizes the importance of integrating the hazard mitigation strategies identified in the 2020 update into these planning mechanisms.

The County has incorporated the requirements of the Local Mitigation Strategy into their comprehensive plans and land development regulations. The process for amending local government comprehensive plans is specified by Florida

law, Section 163.3 191, Florida Statutes, which requires local governments to prepare Evaluation and Appraisal Reports of their comprehensive plan at least once every seven years. The purpose of the process is to consider changes to comprehensive plans that reflect new information, comprehensive plan successes and failures, changing conditions and trends, as well as changes in state policy on planning and growth management which may have occurred during the prior seven years. The County considered new information and policy guidance provided in the LMS in their next evaluation and appraisal report for amendments to their comprehensive plans.

The LMS Working Group consulted, reviewed and analyzed the following documents for review and incorporation into the 2020 LMS:

- ✓ **Union County Comprehensive Plan** - the Future Land Use Element, the Suwannee River System, the Housing Element, and the Conservation Element
- ✓ **Union County Land Development Regulations** – Article 8
- ✓ **City of Lake Butler's Comprehensive Plan –** the Future Land Use Element, the Conservation Element and the Capital Improvements Element
- ✓ **City of Lake Butler's Land Development Regulations** – Article 8
- ✓ **Town of Worthington Springs Comprehensive Plan** – the Future Land Use Element and the Conservation Element
- ✓ **Town of Worthington Springs Ordinance** - No. 2017-03
- ✓ **Town of Raiford Comprehensive Plan -** the Future Land Use Element and the Conservation Element
- ✓ **Union County Comprehensive Emergency Management Plan,** updated in 2020; has a prescribed process to incorporate the natural hazard risk assessment from the LMS Plan
- ✓ **Suwanee River Water Management District (SWRMD) Strategic Plan**, 2020 – 2024; Flood Protection Section, Environmental Resource Permitting Program
- ✓ **FEMA Flood Insurance Study (FIS), Flood Insurance Rate Maps (FIRM**); revised effective date: November 2, 2018 to include detailed floodplain studies and map revisions

The County, the City of Lake Butler, the Town of Worthington Springs, and the Town of Raiford address natural hazards and hazard mitigation strategies to include the LMS Mitigation Goals and Objectives in their comprehensive plan, land development regulations, and ordinances specifically through their flood plain management and flood prevention damage articles and regulations. A summary of mitigation elements in each of the above listed documents is given below; the flood ordinances and FEMA flood maps are briefly discussed below but are presented in more detail in Section 4, flood section of this plan.

In addition, land use regulations are incorporated through building codes and specifically through their flood damage prevention ordinances, and the future land use planning and plans for the entire County incorporates specifics from the LMS risk assessment to limit development in hazard areas and reduce risk. These examples demonstrate that each participating jurisdiction is committed to include mitigation procedures through the existing plans, regulations, ordinances and programs.

A summary of mitigation elements in each of the above listed documents is given below; the flood ordinances and FEMA flood maps are briefly discussed below but are presented in more detail in Section 4, flood section of this plan.

A. Union County Comprehensive Plan, *amended October 15, 2018, ordinance no.18-06*

Future Land Use Element

Environmentally Sensitive Land Use

Lands classified as Environmentally Sensitive are areas, which are considered in need of special planning and treatment regarding land development regulation. Environmentally Sensitive Areas are lands which lie within the areas

of the 100- year flood, as designated by the Federal Emergency Management Agency, Flood Insurance Rate Map, dated August 4, 1988, located along the Santa Fe River, along Olustee Creek and additional areas as identified within the Future Land Use Plan Map of this Comprehensive Plan as Environmentally Sensitive Areas. This designated corridor area shall conform with the following densities provided that within the Environmentally Sensitive Areas-category dwelling units may be clustered on smaller lots with no lot being less than 5 acres, if the site is developed as a Planned Residential Development and a density of 1 dwelling unit per 5 acres be maintained on site.
Further, within the Environmentally Sensitive Area-2 category, dwelling units may be clustered on smaller lots with no lot being less than 5 acres, if the site is developed as a Planned Residential Development and a density of 1 dwelling unit per 10 acres is maintained on site as follows: Policy I.1.5 - 2 - The development shall provide for a minimum of a 50 foot undisturbed buffer from adjacent properties, and a minimum 50 foot setback from a lake, pond or wetland. This buffer may be a portion of the required undeveloped area.
All Planned Rural Residential Developments shall be developed as follows: Policy I.2.2 – 3 - The development shall provide a minimum of a 50 foot undisturbed buffer from adjacent properties and a minimum 50 foot setback from a lake, pond or wetland. This buffer area may be a portion of the required undeveloped area.
Policy I.3.5 - The County shall participate in the National Flood Insurance Program and regulate development and the installation of utilities in flood hazard areas in conformance with the program's requirements.

Suwannee River System, *100-Year Floodplain Special Planning Area*
OVERALL GOAL TO PROTECT AND MAINTAIN THE NATURAL FUNCTIONS OF THE SUWANNEE RIVER SYSTEM (DEFINED AS THAT PART OF THE 100 YEAR FLOOD PLAIN OF THE SANTA FE RIVER AS SHOWN ON THE FUTURE LAND USE MAP) INCLUDING FLOODWATER STORAGE AND CONVEYANCE, WATER QUALITY ASSURANCE, AND FISH AND WILDLIFE HABITAT, WHILE ALLOWING FOR THE APPROPRIATE USE AND DEVELOPMENT OF THE LAND.

Objective S.1 - To help ensure that proposed subdivision wholly or partially within that part of the 100-year floodplain of the Suwannee River system as shown on the Future Land Use map are conducted in accordance with the physical limitations of this environmentally sensitive area, the County shall continue coordination provisions between the County and all agencies with jurisdiction within this area. Such coordination provisions shall provide a mechanism for all such agencies to review and make comment on such proposals or activities.
Policy S.1.1 - The County shall request the Suwannee River Management District to provide a complete set of topographic maps delineating the 100-year and 10-year flood elevations within the County's jurisdiction along the Suwannee River system.
Policy S.1.2 - The County shall have the Suwannee River Water Management District notified of preliminary subdivision plats, site and development plans, rezoning or reclassification of lands, and special exception or special permit hearings within that part of the 100-year floodplain of the Suwannee River system as shown on the Future Land Use Map. The purpose of such notification is to provide opportunity for the District to coordinate, among appropriate agencies, the review and commenting on the potential impact of such plans or proposals on the natural resources of the Suwannee River system.
Policy S.1.3 - The review of preliminary subdivision plats and site and development plans within that part of the 100 year flood plain of the Suwannee River system as shown on the Future Land Use map shall be based on the best available information regarding the physical characteristics of the site, including floodplain and wetlands delineation, soil conditions, vegetative cover, and critical wildlife habitat areas.

Objective S.2 - The County shall continue to take the actions identified within the following policies to protect unique natural areas within the Suwannee River system, including but not limited to springs and spring runs, critical habitat areas for fish and wildlife, unique vegetative communities, and public recreation areas.
Policy S.2.1 - The County shall provide for the evaluation of unique natural areas within that part of the 100-year floodplain of the Suwannee River system as shown on the Future Land Use Map during the development review process. The identification of such areas shall be based on the best available information provided by the Suwannee

River Water Management District or other appropriate sources, including but not limited to land cover and vegetative mapping.
Policy S.2.2 - The County shall require a 10 foot undisturbed regulated buffer along the property lines of public lands within the 100-year floodplain of the Suwannee River system for the purposes of visual screening, stormwater runoff and erosion control, public safety, and buffering potentially incompatible land uses. Variations in the width of this buffer shall be made only for cases of undue hardship and on a site-specific review.
Policy S.2.3 - The County shall monitor the use of County-owned facilities on or within the 100-year floodplain of the Suwannee River system to ensure that the public use of these facilities does not threaten the facility or adjacent natural resources. Such facilities shall be maintained in order to prevent any potential adverse impacts to the Suwannee River system such as erosion, release of inadequately treated stormwater or wastewater, or the accumulation of trash and debris.
Policy S.2.4 - The County shall designate publicly owned springs, spring runs, unique vegetative communities and critical habitats within the Suwannee River system as conservation on the Future Land Use Plan Map.

Objective S.3 - The County shall continue to regulate land use types, densities and intensities for all lands within that part of the 100 year flood-plain of the Suwannee River System as shown on the Future Land Use map.
Policy S.3.1 - The County hereby designates those lands within the County's jurisdiction lying within that part of the100 year floodplain of the Suwannee River System as shown on the Future Land Use map as an Environmentally Sensitive Area.
Policy S.3.2 - The areas within that part of the 100 year flood-plain of the Suwannee River System as shown on the Future Land Use map which are located outside the designated urban development areas shall conform with the densities specified within the Environmentally Sensitive Areas-1 and Environmentally Sensitive Areas- 3 categories, provided that within the Environmentally Sensitive Areas-3 category, dwelling units may be clustered on smaller lots with no lot being less than 2.5 acres, if the site is developed as a Planned Residential Development and a density of 1 dwelling unit per 10 acres be maintained on site in accordance with the criteria listed in the land use classification policy of this element. All lots within Environmentally Sensitive Areas shall have an average length to average width ratio no greater than 3 to 1. In addition, the County shall prohibit the location of intensive agriculture (the term intensive agriculture means all areas of concentrated animal density generally associated with milking barns, feedlots, chicken houses and holding pens).
Policy S.3.3 - The County shall, inside designated urban development areas within that part of the 100 year flood plain of the Suwannee River System as shown on the Future Land Use map, limit dwelling unit density of residential uses to no greater than 1.0 dwelling units per 5 acres in areas not served by centralized potable water systems and sanitary sewer systems and 4.0 dwelling units per acre, provided a centralized potable water system and sanitary sewer system exists and each individual parcel conforms to all applicable state and County regulations. This higher density shall require approval of an amendment to the Future Land Use Plan Map to establish a district, which allows 4.0 dwelling units per acre.
Policy S.3.4 - The County shall prohibit development on the river berm by requiring a minimum undisturbed, vegetated buffer of 75 feet measured from the generally recognized river bank of the Santa Fe River be maintained for all single-family residential and agricultural uses and silvicultural activities. All other permitted land uses shall conform to the variable buffer requirements contained in Rule 40B-4.3030(4), Florida Administrative Code, as administered by the Water Management District, in effect on January 1, 2003. Exception shall be made for the provision of reasonable access to the river; and resource-based recreational activities within buffer areas. Reasonable access shall mean the minimum amount of clearing necessary for access not to exceed 25 feet in width.

Objective S.4 - The County shall ensure that all development and redevelopment occurring in that part of the 100 year flood plain of the Suwannee River System as shown on the Future Land Use map meet the building and design standards of the National Flood Insurance Program, the County, and the Suwannee River Water Management Districts.

Policy S.4.1 - The County shall conform to the National Flood Insurance Program requirements for construction activities undertaken in that part of the 100-year flood plain of the Suwannee River System as shown on the Future Land Use map.
Policy S.4.2 -The County shall require all habitable structures be elevated no less than 1 foot above the 100-year flood elevation without the use of fill materials in the regulatory floodway of the Suwannee River system.
Policy S.4.3 - The County shall require all road construction and improvement projects within that part of the 100 year flood plain of the Suwannee River System as shown on the Future Land Use map be designed in such a manner as to avoid any increase in floodway obstruction, any increase in the peak rate or volume of stormwater runoff, and any increase in pollutant loading to the receiving waters.

Housing Element
Policy III.1.2 - The County shall permit the construction of government subsidized housing only within areas which are served by public facilities which meet or exceed the adopted level of service standards established in the other elements of this Comprehensive Plan. In addition, government subsidized housing shall be prohibited within areas subject to the 100-year floodplain, as designated by the Federal Emergency Management Agency, Flood Insurance Rate Map.

Conservation Element
Policy V.2.6 - The County shall require all new development to maintain the natural functions of wetlands and 100-year floodplains so that the long term environmental integrity and economic and recreational value of these areas is maintained.
Policy V.2.7 - The County shall regulate development within that part of the 100-year floodplain of the Santa Fe River as shown on the Future Land Use map by establishing these areas as Environmentally Sensitive in accordance with the land use classification policy contained within the Future Land Use Element of this Comprehensive Plan. In addition, in order to maintain the flood-carrying and flood storage capacities of the floodplains and reduce the risk of property damage and loss of life, the County shall adopt flood damage prevention regulations and in the interim shall continue to enforce the provisions of the National Flood Insurance Program and regulate all development and the installation of utilities in the County within flood hazard areas in conformance with the program requirements. Further, the County shall require all structures in the County to be clustered on the non-floodprone portion of a site. Where the entire site is in a floodprone area or an insufficient buildable area on the non-floodprone portion of a site exists, all structures, located in floodplains, shall be elevated no lower than 1 foot above base flood elevation. Non-residential structures located in floodplains may be flood proofed in lieu of being elevated provided that all areas of the structure below the required elevation are watertight. In addition, where the entire site is in a floodprone area or an insufficient buildable area on the non-floodprone portion of site exists, all structures located in areas of shallow flooding shall be elevated at least two feet above the highest adjacent grade.

B. Union County Land Development Regulations *(additional duties and responsibilities for the floodplain administrator is outlined)*

Article Eight – Flood Damage Prevention Regulations
Section 8.1, 8.1.3 - Intent. The purposes of this Article and the flood load and flood resistant construction requirements of the Florida Building Code are to establish minimum requirements to safeguard the public health, safety, and general welfare and to minimize public and private losses due to flooding through regulation of development in flood hazard areas to: 1. Minimize unnecessary disruption of commerce, access and public service during times of flooding; 2. Require the use of appropriate construction practices in order to prevent or minimize future flood damage; 3. Manage filling, grading, dredging, mining, paving, excavation, drilling operations, storage of equipment or materials, and other development which may increase flood damage or erosion potential; 4. Manage the alteration of flood hazard areas, watercourses, and shorelines to minimize the impact of development on the natural and beneficial functions of the

floodplain; 5. Minimize damage to public and private facilities and utilities; 6. Help maintain a stable tax base by providing for the sound use and development of flood hazard areas; 7. Minimize the need for future expenditure of public funds for flood control projects and response to and recovery from flood events; and 8. Meet the requirements of the National Flood Insurance Program for community participation as set forth in the Title 44 Code of Federal Regulations, Section 59.22.
Section 8.1.5 Warning. The degree of flood protection required by this Article and the Florida Building Code, as amended by the Board of County Commissioners, is considered the minimum reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger floods can and will occur. Flood heights may be increased by man-made or natural causes. This Article does not imply that land outside of mapped special flood hazard areas, or that uses permitted within such flood hazard areas, will be free from flooding or flood damage. The flood hazard areas and base flood elevations contained in the Flood Insurance Study and shown on Flood Insurance Rate Maps and the requirements of Title 44 Code of Federal Regulations, Sections 59 and 60 may be revised by the Federal Emergency Management Agency, requiring the Board of County Commissioners to revise these regulations to remain eligible for participation in the National Flood Insurance Program. No guaranty of vested use, existing use, or future use is implied or expressed by compliance with this Article.

C. City of Lake Butler Comprehensive Plan, *amended April 18, 2017 ordinance no. 17-01*

Future Land Use Element
Policy I.4.1 - The City's land development regulations shall contain specific and detailed provisions to manage future growth and development to implement the Comprehensive Plan, which shall contain at a minimum the following provisions to: 3. Protect environmentally sensitive lands identified within the Conservation Element. 4. Regulate areas subject to seasonal and periodic flooding and provide for drainage and stormwater management.
Policy I.6.4 -The City shall participate in the National Flood Insurance Program and regulate development and the installation of utilities in flood hazard areas in conformance with the programs requirements. Further, the City shall require all structures to be clustered on the non-floodprone portion of a site or where the entire site is in a floodprone area, structures shall be elevated at least two (2) feet above the highest adjacent grade.

Objective I.10 - The City shall adopt regulations to protect natural resources and environmentally sensitive lands (including but not limited to wetlands and floodprone areas) by May 1, 1992.

Conservation Element
Policy V.2.6 - The City's land development regulations shall require all new development to maintain the natural functions of natural flood storage, pollution alternatives in wetlands and 100-year floodprone areas.
Policy V.2.7 - The City shall participate in the National Flood Insurance Program and regulate development and the installation of utilities in flood hazard areas in conformance with the program requirements. Further, the City shall require all structure to be clustered on the non-floodprone portion of a site or where the entire site is in a floodprone area, structure shall be elevated at least two feet above the highest adjacent grade.

Capital Improvements Element
Policy VIII.4.7 - The City shall replace or renew community facility plants damaged due to storm surge or flood only where such facility can meet minimum requirements for flood proofing.

D. City of Lake Butler Land Development Regulations *(additional duties and responsibilities for the floodplain administrator is outlined)*

Article Eight – Flood Damage Prevention Regulations

Section 8.1, 8.1.3 - Intent. The purposes of this Article and the flood load and flood resistant construction requirements of the Florida Building Code are to establish minimum requirements to safeguard the public health, safety, and general welfare and to minimize public and private losses due to flooding through regulation of development in flood hazard areas to: 1. Minimize unnecessary disruption of commerce, access and public service during times of flooding; 2. Require the use of appropriate construction practices in order to prevent or minimize future flood damage; 3. Manage filling, grading, dredging, mining, paving, excavation, drilling operations, storage of equipment or materials, and other development which may increase flood damage or erosion potential; 4. Manage the alteration of flood hazard areas, watercourses, and shorelines to minimize the impact of development on the natural and beneficial functions of the floodplain; 5. Minimize damage to public and private facilities and utilities; 6. Help maintain a stable tax base by providing for the sound use and development of flood hazard areas; 7. Minimize the need for future expenditure of public funds for flood control projects and response to and recovery from flood events; and 8. Meet the requirements of the National Flood Insurance Program for community participation as set forth in the Title 44 Code of Federal Regulations, Section 59.22.

Section 8.1.5 Warning. The degree of flood protection required by this Article and the Florida Building Code, as amended by the Board of County Commissioners, is considered the minimum reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger floods can and will occur. Flood heights may be increased by man-made or natural causes. This Article does not imply that land outside of mapped special flood hazard areas, or that uses permitted within such flood hazard areas, will be free from flooding or flood damage. The flood hazard areas and base flood elevations contained in the Flood Insurance Study and shown on Flood Insurance Rate Maps and the requirements of Title 44 Code of Federal Regulations, Sections 59 and 60 may be revised by the Federal Emergency Management Agency, requiring the Board of County Commissioners to revise these regulations to remain eligible for participation in the National Flood Insurance Program. No guaranty of vested use, existing use, or future use is implied or expressed by compliance with this Article.

E. Town of Worthington Springs Comprehensive Plan

Future Land Use Element

The Town's land development regulations shall contain specific and detailed provisions to manage future growth and development to implement the Comprehensive Plan, which shall contain at a minimum the following provisions: Policy I.4.1 – c - Protect environmentally sensitive lands identified within the Conservation Element; d - Regulate areas subject to seasonal and periodic flooding and provide for drainage and stormwater management.

Policy I.6.4 - The Town shall participate in the National Flood Insurance Program and regulate development and the installation of utilities in flood hazard areas in conformance with the programs requirements. Further, the Town shall require all structures to be clustered on the non-flood prone portion of a site or where the entire site is in a flood prone area, structures shall be elevated no lower than 1 foot above base flood elevation. Non-residential structures located in A-Zones as designated on the FIRM for the Town, August 4, 1988, may be flood proofed in lieu of being elevated provided that all areas of the structure below the required elevation area water tight in conformance with NFIP requirements in effect upon the adoption of this COMP.

Policy I.10.3 - The Town's land, upon adoption of the COMP, shall in addition to the provisions stated within policies V.2.4 and V.2.5 of the COMP, require that commercial and industrial structures be prohibited within flood prone areas of the site where other alternatives for development exist.

Policy I.10.4 - The Town's land development regulations shall require in addition to the provisions stated within policies V.2.4 and V.2.5 of the COMP, that where other alternatives for development exist that no lots within a proposed subdivision plat intended to be used with for the location of residential dwelling units be sited within a flood prone area.

Conservation Element
Policy V.2.4 - The Town shall require a 35-foot natural buffer around all wetlands and prohibit the location of residential, commercial and industrial land uses within the buffer areas, but allow resource-based recreational activities within buffer areas.
Policy V.2.6 - The Town's land development regulations shall require all new development to maintain the natural functions of natural flood storage, pollution attenuation, in wetlands and 100-year flood prone areas.
Policy V.2.7 - The Town shall participate in the NFIP and regulate development and the installation of utilities in flood hazard areas in conformance with the program requirements. Further, the Town shall require all structures to be clustered on the non-flood prone portion of a site or where the entire site is in a flood prone area, structures shall be elevated no lower than 1 foot above base flood elevation. Non-residential structures located in A-Zones as designated on the FIRM for the Town, August 4, 1988, may be flood proofed in lieu of being elevated provided that all areas of the structure below the required elevation are water tight in conformance with NFIP requirements in effect upon the adoption of the COMP.
Policy V.2.11 - The Town's land development regulations shall require a 50-foot regulated natural buffer adjacent to all perennial rivers, streams, and creeks and prohibit the location of residential, commercial, and industrial land uses within the buffer areas, but allow resource-based recreational activities within buffer areas.

F. Town of Worthington Springs Ordinance No. 2017-03

An ordinance by the town council amending the Town of Worthington Springs code of ordinances to repeal the flood damage prevention ordinance adopted February 4, 2009; to adopt a new floodplain management ordinance; to adopt flood hazard maps, to designate a floodplain administrator, to adopt procedures and criteria for development in flood hazard areas, and for other purposes; providing for applicability; repealer; severability; and effective date. Whereas, the FEMA has identified special flood hazard areas within the boundaries of the Town of Worthington Springs and such areas may be subject to periodic inundation which may result in loss of life and property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base, all of which adversely affect the public health, safety and general welfare, and whereas the Town of Worthington Springs was accepted for participation in the NFIP on June 3, 1986 and the Town Council desires to continue to meet the requirements of Title 44 Code of Federal Regulations, Sections 59 and 60, necessary for such participation.

G. Town of Raiford Comprehensive Plan

Future Land Use Element
Policy I.6.4 - The Town shall participate in the National Flood Insurance Program and regulate development and the installation of utilities in flood hazard areas in conformance with the programs requirements.

Conservation Element
Policy V.2.4 - The Town shall require a 35-foot natural buffer around all wetlands and prohibit the location of residential, commercial and industrial land uses within the buffer areas, but allow agriculture, silviculture and resource-based recreational activities within buffer areas subject to best management practices.
Policy V.2.6 - The Town shall require all new development to maintain the natural functions of environmentally sensitive areas, including but not limited to wetlands and 100-year floodplains so that the long term environmental integrity and economic and recreational value of these areas is maintained. In floodplain areas, dredge and fill shall be prohibited and clearing of natural vegetation minimized.
Policy V.2.7 - The Town shall regulate development within 100-year floodplains in order to maintain the flood carrying and flood storage capacities of the floodplains and reduce the risk of property damage and loss of life. In floodplain areas, dredge and fill shall be prohibited and clearing of natural vegetation minimized.

Policy V.2.11 - The Town shall require a 35-foot regulated natural buffer adjacent to all perennial rivers, streams and creeks and prohibit the locations of residential, commercial and industrial land uses within the buffer areas, but allow agriculture, silviculture and resource-based recreational activities within buffer areas subject to best management practices.

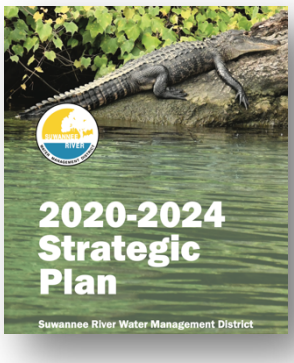
H. Union County Emergency Management Plan (CEMP)

The Union County Comprehensive Emergency Management Plan (CEMP), updated in May 2020, was reviewed and referenced in this LMS planning cycle.

I. Suwannee River Water Management District (SRWMD) Strategic Plan 2020 - 2024

Flood Protection Section

SRWMD works with the FDOT, FDEM, local governments, and landowners to implement regional and local flood protection and flood control projects. Such projects assist local governments to manage, maintain, or expand stormwater infrastructure to better capture runoff, increase stormwater storage, and reduce peak discharge rates.



Also the District provides information to the public to reduce and mitigate flood risks. The District partners with Federal Emergency Management Agency (FEMA) to update floodplain maps to help the public make informed decisions that reduce risk to life and property. Further, SRWMD is the primary source of current flooding information for other agencies and the public, including real-time river levels and rainfall amounts, so that people can make well- informed decisions about flood protection and property at risk.

Through the environmental resource permitting (ERP) Program, the District ensures that development does not result in flooding. Permit reviews are performed to prevent net loss of the 100-year floodplain or increases in flood levels. Permit evaluations also consider specific storm design conditions and potential impacts to upstream and downstream properties. Two Goals are outlined:

Goal One – Reduce and Mitigate Flooding Risks, Strategies include:

- Promote naturally occurring recharge by increasing water storage through hydrologic restoration
- Identify and study 100-year flood elevations of unstudied parcels/areas which are prone to flooding
- Identify unmet flood protection needs of local governments
- Conduct frequent river inspections for unpermitted activities and structures
- Communicate best available data on flood risk to stakeholders

Goal Two – Encourage Non-Structural Flood Plain Management Approaches, Strategies include:

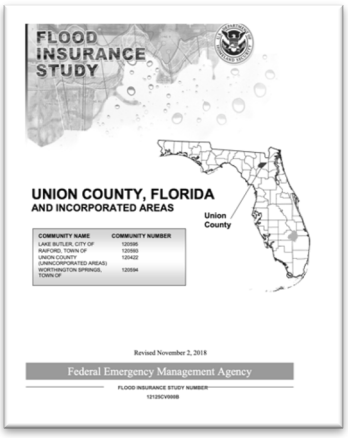
1. Maximize land acquisition and/or development restrictions of land within 100-year floodplain
2. Seek opportunities and evaluate all land purchases for flood protection potential
3. Coordinate with appropriate governmental entities on data sharing and consistency for flood forecasts
4. Increase public awareness of flood protection tools, permit requirements, and flood risks
5. Strategically partner with stakeholders to identify and implement flood projects

- Coordinate with FDEP to develop a consistent message to evaluate flood risk of single-family homes

SRWMD will measure progress towards the completion of individual and programmatic tasks contained within the aforementioned goals and strategies by tracking the completion of the planning, funding, construction, or

implementation phases of the tasks and strategies. Achievements will be measured by the percent of acreage of riverine floodplain under protection; whether the District's cost-share programs have funded at least one flood control project each year; funding opportunities identified for the Dixie County surface water management projects; the acres of hydrologic restoration implemented and maintained, as well as the associated recharge benefits; and the number of compliance cases addressed, and trainings provided.

J. FEMA Flood Insurance Study (FIS), Flood Insurance Rate Maps (FIRM) effective date: February 4, 2009; revised effective date: November 2, 2018



Revised FIS Effective Date: November 2, 2018 – to change Special Flood Hazard Areas, to change zone designations, and to reflect updated topographic information.

Physical Map Revision (PMR), Effective November 2, 2018:

For this PMR, Lake Butler, Deckles Millpond, and Fivemile Creek were studied using detailed methods. In addition, Unnamed Tributary to Santa Fe River was redelineated as a part of this revision by utilizing the profiles and floodway data tables from the February 4, 2009 revision. An updated digital elevation model (DEM) derived from LiDAR flown in 2011 was used to map this flooding source.

Additional information on the FIS is located in Section 5 of the LMS Plan.

Hazard Mitigation Projects

Developing hazard mitigation projects enables the Working Group participants to highlight the most significant vulnerabilities, again to assist in prioritizing subsequent efforts to formulate and characterize specific hazard mitigation projects to eliminate or minimize those vulnerabilities.

Once the highest priorities are defined, the Working Group members can identify specific mitigation projects for the plan that would eliminate or minimize those vulnerabilities. This procedure involves describing the project, relating it to one of the goals and objectives established by the Working Group, and justifying its implementation on the basis of its economic benefits and/or protection of public health and safety, as well as valuable or irreplaceable resources.

The proposed mitigation projects are "prioritized" for implementation in a consistent manner by each participating organization using a set of ten objective criteria.

1) Number of people (from 1 to 10,000 or more) who will benefit
2) The risk rating, according to the community, for the addressed hazard
3) Immediate need or post-disaster priority
4) Enhancement of special needs population or promotion of hazard awareness
5) Reduction of risk to structures that have been repetitively damaged
6) Critical facility or infrastructure
7) Environmentally sound
8) Technically feasible
9) Encourage cooperation among government entities
10) Cost effective

In characterizing a mitigation project for incorporation into the LMS plan, it is important to recognize that the level of analysis conducted by each organization involved has been intentionally designed to be appropriate for this stage in the planning process.

In the interest of the Working Group to have a satisfactory level of confidence that a proposed mitigation project, when it is implemented, will be cost effective, feasible to implement, acceptable to the community, and technically effective in its purpose. To do this, the technical analyses conducted, including the development of a benefit to cost ratio for each proposal, have been based on a straightforward, streamlined approach, relying largely on the informed judgment of experienced local officials.

The analyses have not been specifically designed to meet the known or anticipated requirements of any state or federal funding agency, due largely to the fact that such requirements can vary with the agency and type of proposal. Therefore, at the point when the organization proposing the project is applying for funding from any state or federal agency, or from any other public or private funding source, that organization will then address the specific informational or analytical requirements of the funding agency.

Developing the Local Mitigation Strategy Plan

After the vulnerability assessment has been performed and mitigation projects are identified by the agency or organization developing the proposed mitigation project, the information used to characterize the project is submitted to the Working Group for review and inter-jurisdictional coordination.

The Working Group members assure that the proposal is consistent with the goals and objectives established by each jurisdiction for the planning period. Once the Working Group has reviewed and coordinated the submitted project, it is formally considered for incorporation into the Union County LMS. The proposed project is identified as consistent with the goals and objectives for the planning period and would be beneficial for the community as a whole if and when implemented. If so, the Working Group then informally votes to incorporate the proposed project into the strategy.

At the annual or semi-annual LMS meetings, each mitigation project included in the plan is evaluated to determine the following:

- ✓ If the project should remain as a valid and ongoing project (deferred until a later time due to funding);
- ✓ If the project is completed (all details are gathered on the hazard(s) mitigated, mitigation goals achieved, jurisdiction, funding source, total cost to complete the project, agency responsible for implementation, timeline to complete the project, and any specific details relevant to the project;
- ✓ if the project should be removed or deleted from the mitigation project list (LMS plan); and
- ✓ If there are any new projects that should be added to the mitigation project list (LMS plan).

See Appendix B for the details on the ongoing, deferred, completed, deleted or new mitigation projects for Union County.

At the end of each planning period, a plan document such as this is prepared for release to the community and for action by the governing bodies of the jurisdictions and organizations that participated in the planning process.

Implementation of Approved Mitigation Projects

Once incorporated into the Union County LMS, the agency or organization proposing the project becomes responsible for its' implementation, if feasible, otherwise it could be assigned to another department, if the LMS Working Group vote and all agree. This could be developing a budget for the effort or completing an application to state and federal agencies for financial support for implementation.

Current Status of Participation in the Working Group

In order to support the participating jurisdictions in the completion of the community profiles and vulnerability assessments, the Working Group sets a schedule for each technical analysis step, provides training in the evaluations needed, and distributes the necessary forms for completion.

The support staff serving the LMS Working Group is from the Union County Emergency Management. The staff facilitated the work of the Working Group by advertising the LMS meetings, notifying the members and general public on the upcoming meeting, preparing the meeting agenda, completing the meeting minutes, updating the LMS mitigation project list, keeping documented data on hazard events as they occur, and provide technical assistance as needed.

The participating jurisdictions, organizations, and individuals in the Union County LMS Working Group have all worked diligently to complete this plan and will continue to do so *in the future to create a truly disaster resistant community for the benefit of all its citizens.*

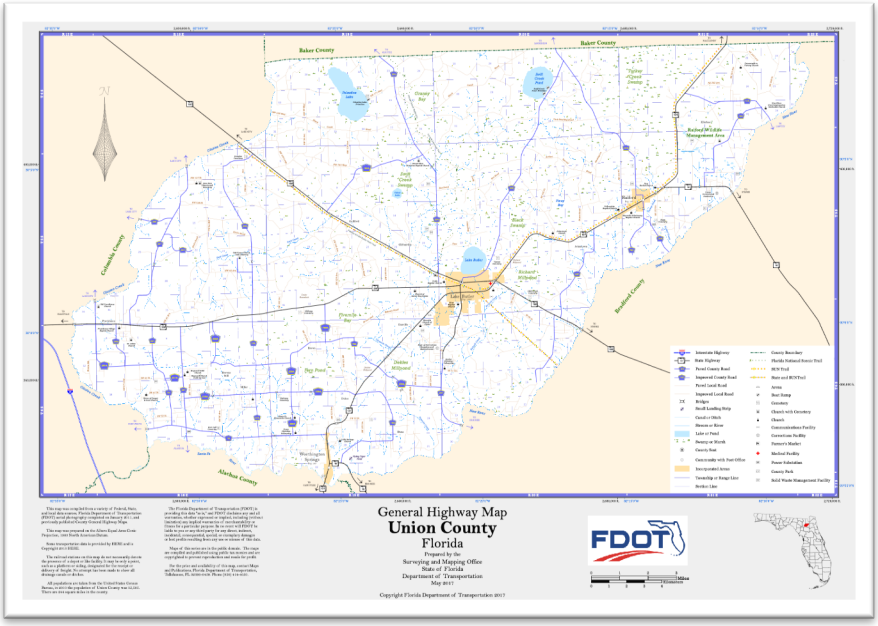
Section 3 – Union County Profile

The County profile provides an overview on infrastructure - roads, geography, topography, aquifer, geology, agriculture, forest, climate, wildlife, education, demographics, vulnerable populations, mobile home parks, disabled adults, economic profile, rural economic development initiative, and asset inventory.

Infrastructure - Roads

Figure 3.1 – Union County Transportation Network

Major transportation routes in Union County include State Roads (SRs) 100, 121, 231 and 16. For the State Highway, there are 57.6 centerline miles and 115.2 lane miles. All major transportation systems in the County receive use by passenger and commercial traffic. These roadways pass through the County's most densely populated areas as well as environmentally sensitive lands.



Source: https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/co-gis/countymaps/newformat/uni2017.pdf?sfvrsn=2f3d3a3a_0

Geography

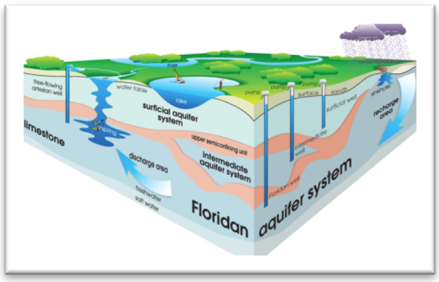
Union County, the smallest county, is located in the north central plains of Florida, and is the 59th[th] most populous county. The Town of Worthington Springs, the Town of Raiford and the City of Lake Butler (the county seat) are the three incorporated municipalities in Union County. The county is bordered to the north by Baker County, to the west by Columbia County, to the southeast by Bradford County, and to the south by Alachua County. Since the 2016 plan approval, no new municipalities have been either created or disbanded.

The total area of Union County is 160,128 acres, or approximately 250.2 square miles, of which 244 square miles is land, and 6.2 square miles is water. There are a number of lakes and other bodies of water in Union County including Swift Creek Pond, Palestine Lake, Dowling Lake, Lake Fisher, and Lake Butler. Rivers and streams that flow through the County include Swift Creek, New River, Richard Creek, Olustee Creek, Fivemile Creek, and the Santa Fe River.

Topography

Union County is located in the Gulf Coastal Lowlands physiographic area with topography ranging from 50 feet to about 140 feet above the National Geodetic Vertical Datum of 1929 (NGVD). The major fresh-water swamp association of soils adjacent to the Santa Fe River consists of nearly level, very poorly drained soils subject to prolonged flooding

Aquifer



The main source of water for the Union County residents is the Floridian Aquifer, one of the most productive sources of ground water in the United States.

Source: https://www.sjrwmd.com/water-supply/aquifer/

Geology

Union County, Florida is underlain by hundreds of feet of alluvial and marine sands, clay, limestones and dolomites. The oldest rock penetrated by water wells is limestone of the Middle Eocene Epoch. Avon Park formation undifferentiated surficial sands and clays of Pliocene to Holocene Age are the youngest sediments present. The Avon Park formation and the youngest overlying limestone units are important freshwater aquifers and the discussion of the geology of Union County will be confined to these Eocene Age and younger sediments.

Agriculture

According to the 2017 USDA Census of Agriculture, there are a total of 308 farms in Union County. These farms comprise a total of 53,767 acres, approximately 34% of the land in the County. Most of the farming activities consist of mainly harvested cropland 10,268 acres, forage, livestock, primarily cattle and calves, milk cows, followed by layers, and hogs and pigs.

Forest or Woodland

As stated by the United States Department of Agriculture, Soil Conservation Service, Soil Survey of Union County, Florida, Woodland Management and Productivity, approximately 123,000 acres, or approximately 78% of the County is woodland or forested area. Ownership of the woodland is split mainly between the large forest products, industries and private landowners.

Wildlife

According to the Florida Natural Areas of Inventory (FNAI) details are listed of several types of vertebrate species of fishes, amphibians, reptiles, birds and mammals that are native to Union County:

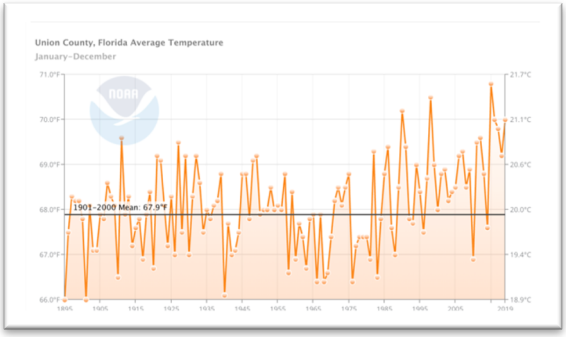
https://www.fnai.org/bioticssearch.cfm

This file is not a comprehensive list of all species and natural communities occurring in the location searched. Only elements documented in the FNAI database are included and occurrences of natural communities are excluded

Climate

Union County is located in the Northern Florida Climatic Zone (NFCZ), which is classified as a hot-humid subtropical region. The average annual temperature in the NFCZ is between 65°F and 70°F. January is the coldest month for the region with an average low of 37°F. The hottest month is July, with an average high of 90°F. Florida is among the wettest states in the United States. Rain falls throughout the year in Lake Butler, however, the most rain falls during the 31 days centered around June 28, with an average total accumulation of 5.9 inches.

The County's average annual temperature from to the National Centers for Environmental Information (NCEI), National Oceanic and Atmospheric Administration (NOAA), Climate at a Glance, data recorded from 1901 – 2000, recorded the mean temperature for Union County is: 67.9°F.



Source:https://www.ncdc.noaa.gov/cag/county/time-series/FL-125/tavg/12/12/1895-2019?base_prd=true&begbaseyear=1901&endbaseyear=2000

Education

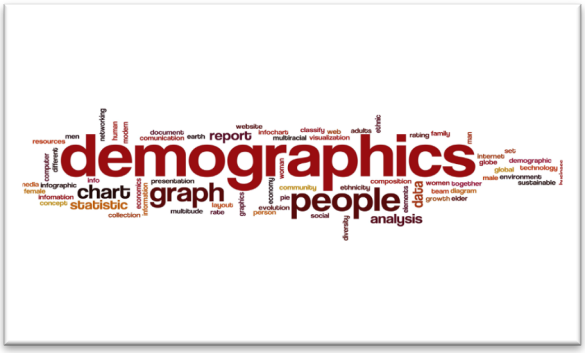
The Union County School District (UCSD) currently operates a total of 5 schools: 1 elementary schools, 1 middle school, 1 high school, 1 adult education and 1 daycare. The UCSD's office is located at 55 SW 6th Street, Lake Butler, FL.

Demographics

Union County has seen a slight decrease -0.2% in population growth from 2010 to 2019 and is currently ranked 59th out of 67 counties in Florida's population – with 0.1% in the State of Florida. It is important to note that the population figure is an estimate, which is based on other related data or change in this data that was recorded during 2020. A projection on data trends, calculated over a number of years, and is used to forecast or project future levels, based on an assumption that that past trends are unchanged. Details in table 3.1 identify the statistical data of the county population.

Table 3.1– Demographics for Union County

Union County is the 59th most populous county in the State of Florida



Population		
2019 Estimate – Union County		**15,505**
% change 2010 – 2019		-0.2%
2020 Estimate		**15,488**
(Inmate Population) – *as of October 2020*		
Union Correctional Institution – main unit		**1,603**
Lake Butler Reception & Medical Center – main unit, west unit, work unit		**1,898**
New River Correctional Institution - work unit (main unit is located in Bradford County)		**432**
Union County Jail		**27**
Population by Jurisdiction		
Estimate figures as of April 1, 2019		
City of Lake Butler		**1,779**
2010 Census for Lake Butler Population	1,897	
Total change 2010 – 2019	-6.2%	
Current population figure April 1, 2019	1,779	
Town of Worthington Springs		**387**
2010 Census for Worthington Springs Population	407	
Total change 2010 – 2019	- 4.9%	
Current population figure April 1, 2019	387	
Town of Raiford		**245**

2010 Census for Raiford Population	255	
Total change 2010 – 2019	-3.9%	
Current population figure April 1, 2019	245	
Unincorporated Union County		**13,094**
2010 Census for Unincorporated Union County Population	12,976	
Total change 2010 – 2018	0.009%	
Current population figure April 1, 2019	13,094	
Population Growth Estimates and Projections		
2020 Projection based on 2019 estimate		**15,488**
% change 2019- 2020		-0.1%
2025 Projection based on 2019 estimate		**15,581**
% change 2020 - 2025		0.6%
Density – Person per Square Mile		
2010		63.8
2019		63.7
Median Age		
2018		40.6
Population Characteristics		
Language spoken at home other than English		
Persons aged 5 and over		5.8%
Place of birth, foreign born		2.8%
Veteran status, Civilian population 18 and over		13.2%

Sources: Florida Legislature, Office of Economic and Demographic Research, August 2020;
http://edr.state.fl.us/content/area-profiles/county/Union.pdf;
Bureau Of Economic and Business Research, https://www.bebr.ufl.edu/population

Data from 2019 reveals nearly 84.5% of the population lives within the unincorporated areas of Union County. The County's three incorporated areas are the City of Lake Butler (approximately 11.5% of the total county population), the Town of Worthington Springs (approximately 2.5% of the total county population), the Town of Raiford (approximately 1.6% of the total county population). New population data will be available after the 2020 Census is completed.

Demographic County Structure

Table 3.2 summarizes the gender and age makeup of Union County. According to the U.S. Census Bureau, American Community Survey (ACS) 2018, the median age of the population is 39.5 years. Approximately 65% of the population is male and 34.9% of the population is female. The age makeup of the county is similar to that of the state with the majority of the population between the ages of 18 and 65.

Table 3.2 Union County, ACS Demographic and Housing Estimates, 2018

	Union	Percent	Florida	Percent
Total Population	15,239		21,299,325	
Male	9,919	65%	10,404,676	48.8%
Female	5,320	34.9%	10,894,649	51.2%
Median Age	39.5		42.2	
Under 5 Years	849	5.6%	1,135,392	5.3%
18 Years and Over	12,353	81%	17,071,450	80.2%
65 Years and Over	2,211	14.5%	4,358,784	20.5%

Source: U.S. Census Bureau,
https://data.census.gov/cedsci/table?q=union%20county%20florida&tid=ACSDP5Y2018.DP05&hidePreview=true

Projections of Florida population by county are made by the Florida Bureau of Economic and Business Research (BEBR) each year. These estimates use historical population changes, monthly electric customer data, and the Bureau's analysis of likely future trends. For years after 2010, BEBR developed nine projections for each county using several different techniques. Using these projections, three averages (high, median, and low) have been calculated. Projections for Union County's growth vary dramatically over the course of the next few decades. Table 3.3 displays how the county's growth could grow steadily or slightly decline through 2045 based upon low, median, or high projections.

Table 3.3 – Projections of Florida Population, Union County, 2020 – 2045

Projections of Florida Population by County, 2020–2045, with Estimates for 2018							
County and State	Estimates, April 1, 2018	2020	2025	2030	2035	2040	2045
Union	15,867						
Low		15,300	15,000	14,600	14,200	13,800	13,300
Median		16,100	16,300	16,500	16,600	16,700	16,700
High		16,900	17,700	18,400	19,200	19,800	20,500

Source: https://www.bebr.ufl.edu/sites/default/files/Research%20Reports/projections_2019.pdf

Race and Ethnic Composition

The Bureau of Economic and Business Research prepared a Population Projection Report by Age, Sex, Race and Hispanic, June 2020, for Florida and its counties, 2020 – 2045, with estimates for 2019. See Figure 3.2.

Figure 3.2 – Population Projections by Age, Sex, Race, and Hispanic Origin

Population Projections by Age, Sex, Race, and Hispanic Origin For Florida and Its Counties, 2020–2045, With Estimates for 2019

County and State	Age/ Sex	Census 2010	Estimates 2019	Projections 2020	2025	2030	2035	2040	2045
UNION									
All Races	Total	15,535	15,505	15,488	15,581	15,633	15,657	15,665	15,656
	0-4	827	752	748	742	712	704	683	667
	5-17	2,183	1,990	1,975	1,961	1,942	1,917	1,893	1,860
	18-24	1,437	1,421	1,411	1,348	1,379	1,354	1,365	1,359
	25-54	7,170	6,781	6,726	6,752	6,664	6,670	6,567	6,592
	55-64	2,364	2,547	2,559	2,426	2,306	2,330	2,393	2,389
	65-79	1,306	1,671	1,719	1,922	2,082	2,013	1,979	1,889
	80+	248	343	350	430	548	669	785	900
	Female	5,490	5,436	5,429	5,491	5,535	5,564	5,590	5,591
	0-4	397	369	366	364	349	345	335	327
	5-17	1,073	961	953	948	944	931	919	903
	18-24	454	473	469	436	445	441	446	444
	25-54	2,264	1,982	1,952	1,963	1,919	1,911	1,861	1,889
	55-64	643	787	799	715	646	660	694	673
	65-79	509	676	699	832	941	918	890	837
	80+	150	188	191	233	291	358	445	518
Non-Hispanic White	Total	11,230	11,158	11,152	11,212	11,243	11,253	11,259	11,246
	0-4	651	608	607	594	565	559	536	532
	5-17	1,710	1,566	1,558	1,558	1,548	1,519	1,491	1,458
	18-24	961	913	902	867	887	883	894	883
	25-54	4,914	4,540	4,493	4,491	4,410	4,374	4,287	4,296
	55-64	1,719	1,872	1,884	1,749	1,644	1,697	1,758	1,745
	65-79	1,059	1,361	1,401	1,575	1,711	1,636	1,603	1,542
	80+	216	298	307	378	478	585	690	790
	Female	4,562	4,526	4,526	4,576	4,612	4,640	4,662	4,666
	0-4	316	298	297	291	277	274	263	261
	5-17	843	775	772	772	769	755	740	724
	18-24	375	367	360	354	362	362	368	363
	25-54	1,911	1,674	1,651	1,638	1,594	1,574	1,527	1,551
	55-64	544	668	677	599	550	577	609	582
	65-79	442	576	597	714	804	780	759	728
	80+	131	168	172	208	256	318	396	457
Non-Hispanic Black	Total	3,468	3,453	3,437	3,430	3,421	3,417	3,414	3,414
	0-4	112	98	97	99	99	98	97	91
	5-17	345	293	287	276	271	273	274	276
	18-24	394	403	402	376	372	368	367	372
	25-54	1,870	1,822	1,810	1,798	1,775	1,778	1,772	1,780
	55-64	531	558	560	562	547	526	521	521
	65-79	189	244	248	276	299	305	303	282
	80+	27	35	33	43	58	69	80	92
	Female	675	645	641	641	641	637	635	636
	0-4	55	47	47	48	48	47	47	44
	5-17	166	129	126	121	119	119	120	121
	18-24	56	71	72	50	51	50	48	51
	25-54	254	211	204	213	207	210	211	217
	55-64	79	93	97	94	77	65	63	64
	65-79	48	78	80	94	110	113	106	90
	80+	17	16	15	21	29	33	40	49
Hispanic	Total	743	788	791	824	849	863	876	876
	0-4	56	40	39	44	43	43	45	41
	5-17	116	120	119	116	110	113	114	113
	18-24	76	96	98	94	107	90	91	92
	25-54	349	375	377	407	422	455	454	455
	55-64	95	96	95	96	96	90	98	106
	65-79	47	54	56	60	61	59	61	55
	80+	4	7	7	7	10	13	13	14
	Female	205	223	221	236	247	250	256	256
	0-4	21	20	19	22	21	21	22	20
	5-17	56	50	49	48	49	50	51	51
	18-24	21	32	34	29	28	26	27	27
	25-54	79	84	82	100	108	115	110	110
	55-64	14	19	19	16	15	14	20	24
	65-79	12	14	14	17	21	18	19	15
	80+	2	4	4	4	5	6	7	9

Source: https://www.bebr.ufl.edu/sites/default/files/Research%20Reports/projections_2020_asrh.pdf

Vulnerable Populations

While conducting the risk and vulnerability assessment, it is important to recognize community members who may require enhanced mitigation services and considerations. According to the American Journal of Managed Care, vulnerable populations include the economically disadvantaged, racial and ethnic minorities, the uninsured, low-income children, the elderly, the homeless, those with chronic health conditions, including severe mental illness. It may also include rural residents, who often encounter barriers to accessing services available to those in more-dense areas. The vulnerability of these individuals is enhanced by race, ethnicity, age, sex, and factors such as income, insurance coverage (or lack thereof), and absence of a usual source of care. By identifying vulnerable populations and considering their numbers, diverse needs, and extent of special services, we can begin planning to further protect these populations through the mitigation strategy.

Inmate Population

As of October 2020:

Union County Correctional Institution (main unit): 1,603 inmates
Lake Butler Reception and Medical Center (main, west and work units): 1,898 inmates *
New River Correctional Institution (work unit): 432 inmates
County Jail: 27 inmates

* Due to COVID 19, the Lake Butler Reception and Medical Center are only accepting inmates on a limited basis for safety and protection of the medical and other staff members. As of October, the capacity is only 62%.

On average there are 5,100+ inmates in the three facilities and jail within Union County. Based on Table 3.1, estimated population figure for 2020, this is approximately 32.9% or 1/3 of the total population within the county. As of October 2020, the current inmate count is 3,960 which represents an estimated 25.6% of the total population within the county.

The facilities have their own emergency planning evacuation mechanisms in place, but it is important to identify the presence of this special inmate population for emergency planning purposes.

Poverty

Table 3.4 statistics from the Office of Economic and Demographic Research notes that 20.6% of Union County's population is living in poverty. Another percentage particulars include 21% of children under the age of 18 live below the poverty level in Union County. The percentages are higher in the county compared to the State figures. Most of these individuals are food stamp recipients, uninsured, and on Medicaid. Those living in poverty are also more likely to be living in vulnerable structures, such as older mobile homes, as well as have increased difficulty in evacuating due to difficulty obtaining adequate means of transportation. This population is also more likely to require shelter provision.

Table 3.4 – Union County % in Poverty, 2018

Percent in Poverty, 2018		
	Union County	Florida
All ages in poverty	20.6%	13.7%
Under age 18 in poverty	21%	20%
Related children ages 5 – 17 in families of poverty	20.1%	18.8%

Sources: Florida Legislature, Office of Economic and Demographic Research, August 2020; http://edr.state.fl.us/Content/area-profiles/county/union.pdf

Mobile Home Parks

All counties in the state of Florida are susceptible to hurricane and tropical storm force winds. These high winds are especially damaging to mobile homes, which represent approximately 46% of Union County's housing stock, 2,566. Special consideration in this risk and vulnerability assessment has been paid to this population and details of the structural integrity of these homes are presented in the Residential Construction Inventory and Grading Portion of the LMS. The Union County mobile home park's data is from the Florida Health report, June 8, 2020.

Table 3.5 – Mobile Home Parks in Union County

Mobile Home Park	Address	City or Town	State	Zip Code	Phone Number	Mobile Home Spaces or Lots
Cypress Pointe Mobile Home Park	1015 SW 1st Road	Lake Butler	FL	32054	(770) 936-6690	24
Howard's Mobile Home Park	SE 53rd Street	Lake Butler	FL	32054	(904) 496-3732	14
Mac's Mobile Home Park	999 SW 6th Avenue	Lake Butler	FL	32054	(386) 623-3956	14
Whitehead Mobile Home Park	550 SW 7th Street	Lake Butler	FL	32054	(386) 496-2154	8
Johns' Mobile Home Park	11836 SW 118th Circle	Worthington Springs	FL	32697	(386) 496-3606	8
Santa Fe Park	SW 116th Circle	Worthington Springs	FL	32697	(912) 663-0856	123
Hidden Oaks	9877 SE 8th Court	Lake Butler	FL	32054	(386) 496-8111	49
Palm RV Park	SR-121 S	Worthington Springs	FL	32697	(904) 496-2540	0
Kizina Estates	15633 SR-121 N	Raiford	FL	32083	(904) 662-3735	5

Maines-DeVoe Mobile Home Park	495 SW 9th Avenue	Lake Butler	FL	32054	(386) 496-2201	6
Total Mobile Home Lots or Spaces						**251**

Source: http://www.floridahealth.gov/environmental-health/mobile-home-parks/index.html

Disabled Adults

Disabled adults are those who are limited in any way in any daily activities because of physical, mental or emotional health problems. According to the U.S. Census Bureau, American Community Survey (ACS) 2018 states that who are limited in any way in any activities because of physical, mental or emotional problems. These populations may require special consideration when planning for disasters, whether it is assistance evacuating in times of disaster or early notification of extreme weather when possible. Planning for these groups will require careful coordination and communication with Union County Emergency Management.

Table 3.6– Disabled Residents for Union County Residents, 2018

Disability Population, ACS 2018		
Disability statistics are based on noninstitutionalized population of 9,724		
	Union County	Percent
Disability Population	1,501	15.4%
Hearing difficulty	331	3.4%
Vision difficulty	147	1.5%
Cognitive difficulty	524	5.9%
Ambulatory difficulty	815	9.2%
Self-care difficulty	265	3%
Independent living difficulty	572	8.3%

Source https://data.census.gov/cedsci/table?q=disability&g=0500000US12125&tid=ACSST5Y2018.S1810&hidePreview=true

Economic Profile

The economic data was collected for Union County from the Office of Economic and Demographic Research which analyzes data from population, housing, employment, the labor force, income and financial health, quality of life, revenue and expenditures, state infrastructure and state and local taxation. The figures were updated as of August 2020.

Table 3.7 – Economic Profile for Union County

Unemployment Data		
Unemployment Rate, 2019 in Union County	3%, a slightly than average figure than the State of Florida @ 3.1%	
Labor Force as Percent of Population		
Aged 18 or Older, Union County, 2019		36.3%
Employment by Industry		
Number of Establishments, 2019 preliminary in Union County		**Percent of All Establishments, 2019 preliminary in Union County**
All Industries	204	204
Natural Resource & Mining	9	4.4%
Construction	34	16.7%
Manufacturing	6	2.9%
Trade, Transportation and Utilities	46	22.5%
Information	1	0.5%
Financial Activities	11	5.4%
Professional & Business Services	25	12.3%
Education & Health Services	25	12.3%
Leisure and Hospitality	9	4.4%
Other Services	11	5.4%
Government	25	12.3%
Average Annual Wages		
Average Annual Employment, % of All Industries, 2019 preliminary		**Average Annual Wages, 2019 preliminary**
All Industries	3,347	$38,871
Resource & Mining	2.6%	$35,839
Construction	6.7%	$34,516
Manufacturing	1.1%	$23,335
Trade, Transportation and Utilities	17.1%	$38,958
Information	N/A	N/A

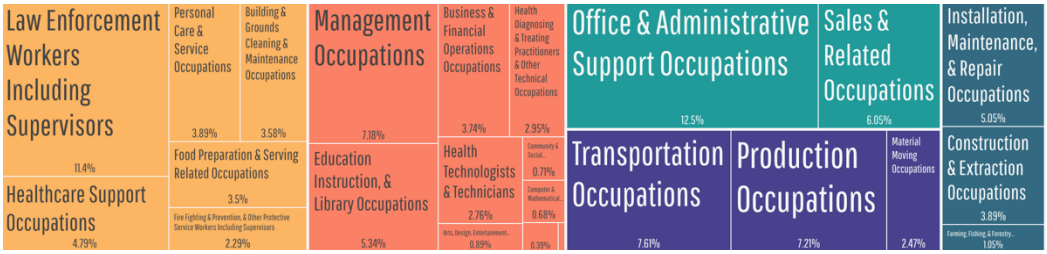
Financial Activities	0.9%	$50,031
Professional & Business Services	2.6%	$39,972
Education & Health Services	8%	$39,604
Leisure and Hospitality	2.7%	$14,838
Other Services	0.7%	$20,957
Government	57.3%	$40,716
Income and Financial Health		
Per Capita Personal Income		
2017; % change 2016 – 2017		$20,756; 4.7%
2018; % change 2017 – 2018		$22,227; 7.1%
Median Income		
Median Household Income		$41,770
Median Family Income		$51,321
Percent in Poverty, 2018		
All ages in poverty		20.6%
Under age 18 in poverty		21%
Related children age 5 – 17 in families in poverty		20.1%

Sources: Florida Legislature, Office of Economic and Demographic Research, August 2020;
http://edr.state.fl.us/Content/area-profiles/county/union.pdf

Details from the Data USA *(a platform that converts US government data into knowledge)*

From 2016 to 2017, employment in Union County declined at a rate of -3.63%, from 3,940 to 3,800 employees. The most common job groups, by number of people living in Union County, FL, are Office & Administrative Support Occupations (475 people; 12.5%), Law Enforcement Workers including supervisors (432 people; 11.4%), and Transportation Occupations (289 people; 7.61%). Figure 3.3 illustrates the share breakdown of the primary jobs held by residents of Union County, FL.

Figure 3.3 – Employment by Occupations



Source: https://datausa.io/profile/geo/union-county-fl/

Rural Economic Development Initiative (REDI)

Established under the Rural Economic Development Initiative (REDI) by F.S. 288.0656, Rural Areas of Opportunity (RAO) previously referred to as Rural Areas of Critical Concern (RACEC) are communities that have been adversely affected by natural disasters or extraordinary events. Union County is a part of the North Central Rural Areas of Opportunity (RAO) (re-designated by Executive Order 15-133) and is comprised of nine counties and (all communities within the county) and one city in Northwest Florida.

REDI provides the following programs and services for rural areas:

- Responds to specific community needs and requests;
- Works with communities to improve their rural economies;
- Assists communities in improving access to housing, health care and educational opportunities;
- Recommends waivers of provisions of economic development programs on a project-by-project basis;
- Undertakes advocacy, outreach and capacity building to improve conditions in rural communities;
- Provides direct access and referrals to appropriate state agencies, as well as county and city associations; and
- Reviews and evaluates the impact of statutes and rules on rural communities and works to minimize adverse impact.

Asset Inventory

The asset inventory provides an outline of resources in the community that can be affected by a hazard event. The inventory is as follows:

- ✓ Building Inventory
- ✓ Critical Facilities

Building Inventory

The LMS Working Group requested information from the property appraiser's office on the building inventory by occupancy type for each jurisdiction. According to the Union County Property Appraisers office (September 2020), there are 5,851 buildings and/or structures throughout the County. Table 3.8 provides the type and number of structures for unincorporated Union County, the City of Lake Butler, the Town of Worthington Springs, and the Town of Raiford.

Table 3.8 – Total Number of Structures in Union County

Type of Structure	County (Unincorporated)	City of Lake Butler	Town of Worthington Springs	Town of Raiford
Single Family Residential	928	336	48	42
Multi-Family Residential	1	33	0	0
Mobile Homes	1041	91	20	26
Agricultural	2759	29	26	22
Commercial and Industrial	38	72	16	8
Government	75	37	11	2
Institutional	54	43	8	7
Miscellaneous	50	21	6	1
Total	**4,946**	**662**	**135**	**108**

Source: Union County Property Appraiser, September 2020

Real Property Just Value

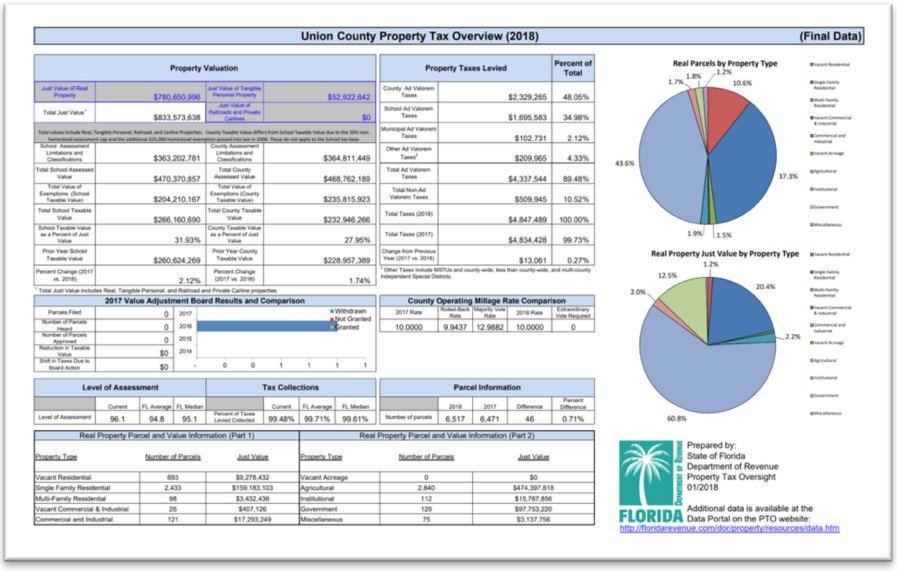
As stated by the Department of Revenue Property Tax Oversight, 01/2018, the total Just Value of the real property parcels, tangible personal property and railroad and private carlines and value information for the County is: $833573638. The "just value" is the fair value of property for tax purposes. Data was extracted from Figure 3.4 – Union County Property Tax Overview report.

Table 3.9 – 2018 Parcel Count and Total Just Value of the Real Property in Union County

Property Type	# of Parcels	Just Value - Real Property
Single Family Residential	2,433	$159,183,103
Multi-Family Residential	98	$3,432,436
Vacant Residential	693	$9,278,432
Agricultural	2,840	$474,397,818
Vacant Acreage	0	$0
Commercial and Industrial	121	$17,293,249
Vacant Commercial and Industrial	25	$407,126
Government	120	$97,753,220
Institutional	112	$15,767,856
Miscellaneous	75	$3,137,756
Total # of Parcels	**6,517**	
Total Just Value of Real Property		**$780,650,996**

Source: State of Florida, Department of Revenue Property Tax Oversight, 01/2018

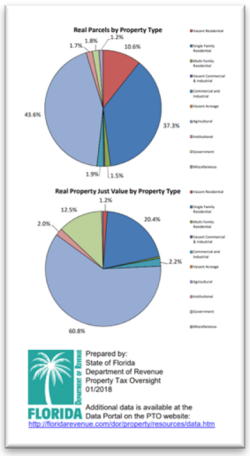
Figure 3.4 – Union County Property Tax Overview



Source: State of Florida, Department of Revenue Property Tax Oversight, 01/2018

The just value is the fair market value of property for tax purposes. It describes the full cash or market value of property and is the price at which the property would most likely sell. As noted from Figure 3.4, the total Just Value of the real property (*only*) parcel data for Union County was: $780,650,996.

Figure 3.5 – Just Value – Real Parcels and Real Property



The tangible personal property is all goods, property other than real estate, and other articles of value that the owner can physically possess and has intrinsic value. Inventory, household goods, and some vehicular items are excluded. As stated from Figure 3.4, the total Just Value for the tangible personal property (*only*) was: $52,922,642.

The total Just Value for real, the tangible property, and railroads and private carlines was: $833,573,638.

Determining Taxable Value (Real Property = land and buildings)

The market value, assessed value and taxable value of your house are often nothing alike. The market value is what your house would sell for in the current market. The assessed value is what your county tax assessor reports the house is worth for purposes of calculating your property tax bill. The taxable value is the figure you actually pay tax on.

Determining Taxable Value	Just Value (Market Value)
	< - > Assessment Differential (i.e. Save our homes)
	= Assessed Value
	< - > Exemptions
	= Taxable Value
	< - > Exemptions
	= Taxable Value

Critical Facilities

The Association of State Floodplain Managers defines a critical facility as those that are essential to community's ability to respond quickly and efficiently to hazard occurrences, recover from and rebuild after hazard occurrences, and meet the needs of its citizens. The critical facilities listed below are those the County has determined are critical to the maintenance of the health, safety and welfare of its residents, and are necessary to help the County respond to and recover from a disaster. These critical facilities should be given special consideration when bearing in mind the threat of a hazard.

The Union County Emergency Management reviews, updates and maintains the critical facility list for accuracy. Updated information was made to the list including name changes and removal of selected facilities. The complete list of the critical facilities with full address, coordinates and other relevant information is submitted to Florida Division of Emergency Management according to the Florida Administrative Code (FAC) 27P-22.005 on an annual basis.

Critical Facilities are defined for the purpose of the LMS plan are those facilities essential to the preservation of life and property during a hazard event and or those facilities critical to the continuity of government as well as those necessary to ensure timely recovery. They are essential to the maintenance of health, safety and welfare of the county residents. Table 3.10 identifies the facilities that provide essential services for the community.

Table 3.10 – Critical Facilities for Union County

Facilities	Count
Emergency Operations Center	1 location
Sheriff's Office/Dispatch	1 location
County Jail/Prisons	1 location/5 locations
Emergency Medical Services/Storage	1 location/1 location
Fire Departments/Stations	3 locations
Hospital/Medical Center/Dental/Dialysis	1 location/1 location/3 locations/1 location
Wastewater Treatment Plant	1 location
Water Treatment Plants	1 location
Lift Stations	6 locations
Solid Waste Center	2 locations
Water Well/Water Tank	2 water well locations
Radio Tower/Communication Towers	1 location/10 locations
Energy	1 location
County Health Department	1 location
Mobile Home/RV Parks	10 locations
Public Schools/School Board	5 locations/1 location
Point of Distribution Centers	1 location
Disaster Recovery Centers (Mobile and Fixed)	7 locations

Shelters (Special Needs, General and Risk)	7 locations
Transport/Transportation	1 location/2 locations
Community Resources (i.e. Churches, Libraries, and State Government Facilities)	Numerous locations

Source: Union County Emergency Management

According to the EM Department, all of the critical facilities identified in Table 3.10 will remain open during times of a disaster excluding the following: churches, libraries, selected state government offices, and mobile home/RV parks. Depending on the type of disaster event, all critical facilities could potentially remain open excluding non-essential state government facilities.

These critical facilities require mitigation project funding. The Hazard Mitigation Grant Program (HMGP), which funds hazard mitigation projects after a declared disaster, will consider the value of the critical facilities' service to the community as a benefit when calculating the benefit-cost ratio for a proposed project.

Section 4 – Hazard Risk and Vulnerability Assessment

Requirements:

§201.6 (c) (2) (i) - Does the Plan include a description of the type, location, and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction.

§201.6 (c) (2) (ii) – Is there a description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community. All plans must also address NFIP insured structures that have been repetitively damaged by floods.

This section of the Union County Local Mitigation Strategy summarizes the results of the hazard identification and vulnerability assessment processes undertaken by the LMS Working Group members. The intent of this section is to provide a summary compilation of the information gathered and the judgments made about the hazards threatening Union County, and the potential vulnerability to those hazards. This assessment will allow County officials and residents to make fully informed decisions as to what types of natural hazards threatens them, how severe the threat is, and the priority to which they should mitigate those threats.

Source: https://www.floridatrail.org/lakebutler/

The risk and vulnerability assessment reflects an effort to analyze and record hazard occurrences that have occurred over the past five years. As described in the last plan update, many of the hazards discussed in this section are relevant to Union County and the participating jurisdictions, selected natural hazards are not listed due to the geographic location and characteristics of the planning area (i.e. dam levee failure, landslides, earthquakes and tsunamis). These hazards are not included in the hazard risk and assessment section due to the very low probability and frequency of the selected hazards with no documented record of historical occurrence.

The risk and vulnerability assessment identifies the characteristics and potential consequences of hazards within the natural environment that may threaten life and property within the Union County. Through the information presented in the county profile and this evaluation section, the county will be able to determine mitigation strategies and prioritize mitigation projects.

The hazard analysis includes a profile of each hazard which identifies county assets vulnerable to each hazard and is a multijurisdictional assessment. This risk assessment for Union County meets the all requirements of 44 CFR § 201, as follows:

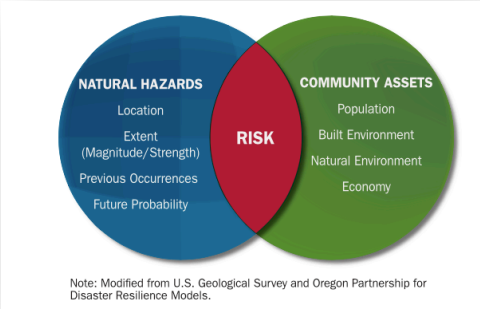
A community's vulnerability to a specific hazard must be coupled with critical factors to perform a risk assessment. By understanding the risk and vulnerability related to a specific hazard, the community can effectively plan mitigation projects and allocate limited financial resources. Additionally, the community can identify the highest priority hazards and focus mitigation strategies to those hazards with the highest risk of occurrence.

Risk, or the probability of loss, depends on three factors:

- ✓ Frequency – How frequent does a known hazard produce an impact within the community.
- ✓ Vulnerability – How vulnerable is a community to the impact produced by a known hazard.
- ✓ Exposure – What is the community's exposure in terms of life and property to the impact produced by a specific hazard.

Once these three factors are established, the risk level faced by a community with regard to any specific hazard can be calculated using the Risk Triangle Approach.
In this approach, the three factors are characterized as the sides of a triangle, and the risk or probability of loss is represented by the triangle's area. If a community wishes to reduce the risk of a specific hazard any of the three factors may be addressed. Mitigation measures applied to any of the three factors can reduce the potential for loss or risk of impacts for any given hazard.
There is very little that can be done to change the frequency of impacts produced by natural hazards. Mitigation planning relative to those hazards must therefore focus on reducing the community's vulnerability or exposure. In terms of technological and societal hazards, the most cost-effective type of mitigation is to limit or reduce the frequency with which such hazards actually occur.
All municipalities in the county are susceptible to the hazards identified therefore the risk assessment was conducted on a countywide basis. Although all communities are susceptible to the identified hazards, the magnitude of those hazards and related disasters can differ.

Natural Hazard Risk and Vulnerability



Note: Modified from U.S. Geological Survey and Oregon Partnership for Disaster Resilience Models.

The important goal for the Working Group members is to maintain a strong, ever-evolving county-wide, multi-hazard mitigation strategy and on a frequent bases evaluate the current and future hazards the county faces and assess the potential vulnerability from each of these hazards.

Periodically analysis occurs of any new information and reassessment the County's vulnerability to each of these threats. This assessment will allow county officials and residents to make fully informed decisions as to the scope of the natural hazards, how severe the threat can be, and the priority to which they should mitigate those threats.

The 2020 Hazard Identification and Vulnerability Assessment represents an effort to continually document hazard occurrences and incorporate relevant, new data. Each hazard addressed in this assessment presents Union County with different challenges and opportunities. Some disasters are more likely than others, and some will impact certain residents more than others.

Each natural hazard profile is summarized into the following sections:
1. Hazard Overview
2. Geographic Area

3. Historical Occurrences
4. Probability
5. Risk and Vulnerability Assessment
6. Impact, and
7. Extent

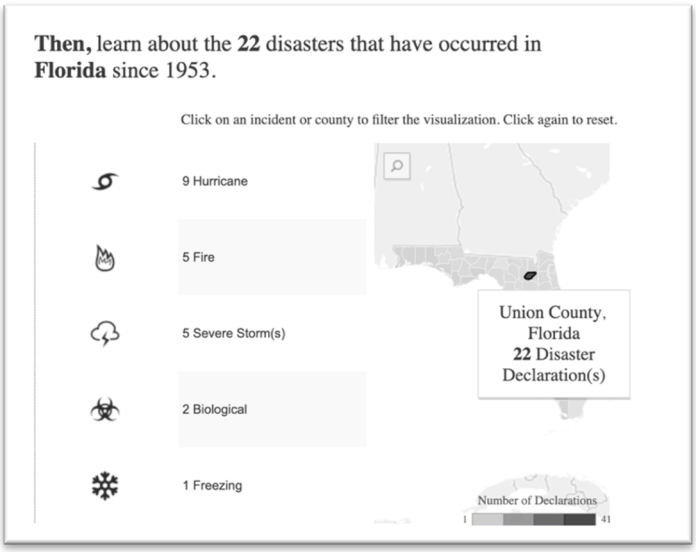
Disaster Declarations

When a disaster strikes that overwhelms the ability of local communities to respond, the President's action authorizes the Department of Homeland Security, Federal Emergency Management Agency (FEMA), to coordinate all disaster relief efforts which have the purpose of alleviating the hardship and suffering caused by the emergency on the local population, and to provide appropriate assistance for required emergency measures, authorized under Title V of the Stafford Act, to save lives and to protect property and public health and safety and to lessen or avert the threat of a catastrophe in the county.

One of the factors associated with risk is the frequency in which the hazard occurs. To understand the risk level and character associated with hazards, the number and type of presidentially declared disasters are recorded below. Union County has been impacted by a number of disasters, many of the most significant being hurricanes, tropical storms, wildfires and severe storms. Many of these incidents have resulted in levels of damage that qualified for federal assistance as the county. Therefore, it is very beneficial to review past major disaster declarations that have impacted the County in preparation for analysis. Since 1953, Union County has received 22 presidential disaster declarations for hurricanes, severe storms, wildfires, and a freeze. Less damaging events that do not call for a presidential declaration are sometimes issued federal, state, or local emergency declarations.

Figure 4.1 discloses that the County experienced over 9 hurricanes, 5 wildfires, 5 severe storms, and 1 freeze event that resulted in a disaster declarations.

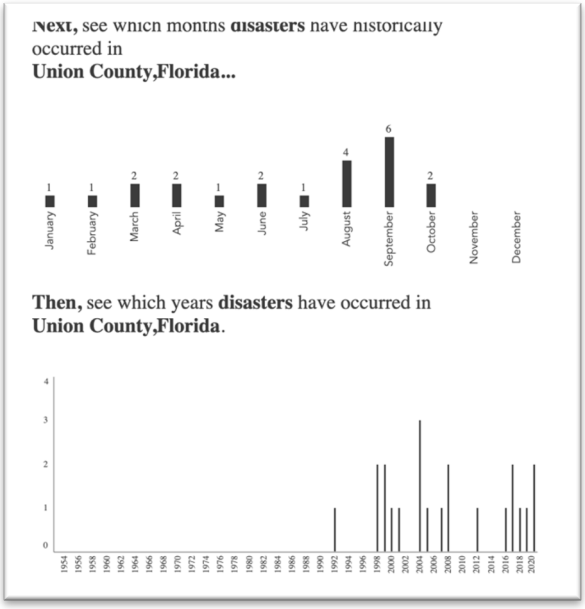
Figure 4.1 – 22 Disasters Types in Union County



Source: https://www.fema.gov/data-visualization-disaster-declarations-states-and-counties

Figure 4.2 displays that the most disasters in months and years that have occurred in the County with the month of September and fiscal year 2004.

Figure 4.2 – 22 Disasters Month and Years in Union County

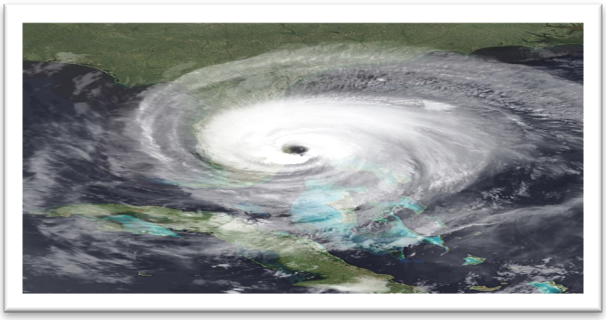


Source: https://www.fema.gov/data-visualization-disaster-declarations-states-and-counties

Based on the summary data in Figures 4.1 – 4.2, table 4.1 provides a list of disaster declarations for the County providing date of incident, disaster event, incident type, declaration # and what type of assistance the County required (i.e. Individual Assistance (IA) or Public Assistance (PA); or both) from 1/1/1985 – 4/20/20.

Table 4.1 – Union County Disaster Declarations (1/1/1985 – 4/20/20)

Photo: Hurricane Jeanne



IA, PA or both	Date – Incident Period	Disaster Event	Incident Type	Declaration #
IA	October 3 – 4, 1992	Flooding, Severe Storms, Tornadoes	Severe Storm(s)	966

IA, PA	December 25, 1997 – April 24, 1998	Severe Storms, Tornadoes	Severe Storm(s)	1195
IA, PA	May 25 - July 22,1998	Fires	Fire	1223
PA	April 13, 1999 - Continuing	Fires	Fire	2258
PA	April 15 – May 25,1999	Fires	Fire	3139
PA	June 5, 2000	Fire	Fire	2306
N/A	December 1, 2000 – January 25, 2001	Freeze	Freeze	1359
PA	August 11 - 30, 2004	Hurricane Charley and Tropical Storm Bonnie	Hurricane	1539
IA, PA	September 3 – October 8, 2004	Hurricane Frances	Hurricane	1545
IA, PA	September 24 – November 17, 2004	Hurricane Jeanne	Hurricane	1561
PA	August 29 – October 1, 2005	Hurricane Katrina Evacuation	Hurricane	3220
PA	May 7, 2007	Fire	Fire	2689
PA	August 18 – September 12, 2008	Tropical Storm Fay	Severe Storm(s)	3288
PA	August 18 – September 12, 2008	Tropical Storm Fay	Severe Storm(s)	1785
IA, PA	June 23 – July 26, 2012	Tropical Storm Debby	Severe Storm(s)	4068
PA	August 31 – September 11, 2016	Hurricane Hermine	Hurricane	4280
IA, PA	September 4 – October 18, 2017	Hurricane Irma	Hurricane	4337
PA	September 4 – October 18, 2017	Hurricane Irma	Hurricane	3385
PA	October 7 – October 19, 2018	Hurricane Michael	Hurricane	3405
PA	August 28 – September 9, 2019	Hurricane Dorian	Hurricane	3419
PA	January 20, 2020 – Continuing	Florida Covid – 19	Pandemic	3432
IA, PA	January 20, 2020 – Continuing	Florida Covid – 19	Pandemic	4486

Source: Federal Emergency Management Agency; https://www.fema.gov/disasters?field_dv2_state_territory_tribal_value_selective=FL&field_dv2_incident_type_tid=All&field_dv2_declaration_type_value=All&field_dv2_incident_begin_value%5Bvalue%5D%5Bmonth%5D=1&field_dv2_incident_begin_value%5Bvalue%5D%5Byear%5D=1985&field_dv2_incident_end_value%5Bvalue%5D%5Bmonth%5D=11&field_dv2_incident_end_value%5Bvalue%5D%5Byear%5D=201

The Natural Hazards profiled are as follows:

Table 4.2 – Natural Hazards Profiled for Union County

Natural Hazards – Union County
Flooding
Sinkholes
Hurricanes/Tropical Storms
Tornadoes
Thunderstorms/Strong Winds, Hailstorms, and Lightning
Riverine Erosion
Wildfires
Drought/Heat Wave
Winter Storms/Freezing Temperatures

Hazard Identification

The information contained in this assessment was identified by using both primary and secondary research materials which includes, but is not limited to, reports from local, state, and national agencies, state and local weather records, the LMS working group members, key local stakeholders, and discussion with residents in Union County.

Dataset information was obtained from the GIS Technical Department at Florida Division of Emergency Management (FDEM). Parcel data was compiled from the Florida Department of Revenue and building count and value data was from the Union County Property Appraiser's Office.

Each hazard analysis includes the possible severity and magnitude, as well as the potential impact of damage within the County from future hazards. After careful deliberation, the Local Mitigation Strategy Working Group developed (and subsequently assigned) the following 4 levels of measurement to determine the probability that future events will affect the incorporated and unincorporated areas of Union County. This method has been retained for the 2020 update, and the probability and magnitude of future hazard events has not changed.

Probability

The probability of a hazard's occurrence is rated minimum through high as outlined below. Each hazard's probability was determined and updated by the Working Group after careful analysis and evaluation. The probability or "chance of occurrence" is defined using an ordinal scale. The scale is as follows:

- ✓ Low: At least 1 occurrence every 10 years
- ✓ Median: At least 1 occurrence every 3 years
- ✓ High: At least 1 occurrence every 10 years

Extent or Magnitude

The extent of a hazard's impact in a worst-case-scenario instance of the hazard is represented in summary sections after each natural hazard.

- ✓ Minor: Any disaster that is likely to be within the response capabilities of local government and results in only minimal need for state or federal assistance.

- ✓ Major: Any disaster that will likely exceed local capabilities and require a broad range of state and federal assistance. FEMA will be informed and notified for federal assistance. The status of the disaster will be predominantly recovery-oriented.

- ✓ Catastrophic: Any disaster that will require massive state and federal assistance, including immediate military involvement. Federal assistance will involve response as well as recovery needs.

The statements are based on the range of magnitude or severity that the county could experience or has experienced using a scientific scale or a quantitative measurement.

Types of scientific scales:
- Enhanced Fujita Scale for tornadoes
- Saffir-Simpson Hurricane Wind Scale for hurricanes/tropical storms/winds
- Keetch-Byram Drought Index for droughts
- Heat Index Chart for heat-related occurrences

Quantitative measurements
Quantitative measurements based on historical occurrences recorded from the following sources: Suwannee River Water Management District (SRWMD); the National Climatic Data Center (NCDC), National Oceanic and Atmospheric Administration (NOAA); the National Weather Service (NWS), the Union County and incorporated areas Flood Insurance Study (FIS); the Florida Climate Center, the Florida Forest Service, Federal Emergency Management Agency (FEMA), the US Department of Agriculture, and the Union County Department of Emergency Management.

The measurements are:
- Flood depth for floods
- Length, width and height for sinkhole measurement (if available)
- Acres burned for wildfires
- High, median or low based on the previous event occurrences

Vulnerability Assessment

Union County has many assets at risk from hazards. The most important risk are injuries to the people or the citizens within the County. Hazard events that could cause significant injuries should be highlighted to ensure that appropriate emergency plans with specific guidelines and response mechanisms are in place. Property includes buildings, critical facilities and infrastructure are other physical assets that could be at risk.

In conducting the risk assessment, evaluate the vulnerabilities that would make an asset more susceptible to damage from a hazard. Examples of types of vulnerabilities could include deficiencies in building construction, process systems, security, protection systems and loss prevention programs which could contribute to the severity of damage when an incident occurs.

An assessment of each of the jurisdictions risk is essential to determine where they vary from the risks facing the entire community. And, estimating potential dollar losses to vulnerable structures, if available. For future planning, Union County will continue to evaluate and update the vulnerability in terms of the types and numbers of future buildings, infrastructure, and critical facilities located in the identified hazard areas.

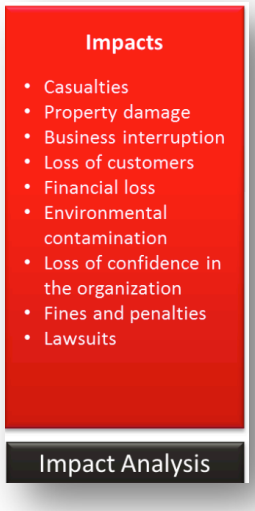
Frequency

This represents how often a hazard that will impact the county is likely to occur. Frequency is based on both how often a hazard has occurred in the past and factors that have been determined to contribute to a hazard's potential future occurrence.

Distribution

This represents the geographic area that would be impacted should a hazard occur. It refers to how wide-spread a disaster's effects will be felt in the county.

Impact



The impact is the consequence or effect of the hazard on the community and its assets. A hazard occurrence impact could have considerable results on your relationships with customers, the surrounding community and other stakeholders. Contemplate scenarios and situations that would cause the County citizens or customers to lose confidence in your organization and its products or services. The impacts from hazards can be reduced by investing in mitigation actions, projects or initiatives.

In evaluating the "impact" for Union County, historical detail impacts and/or an estimate of potential losses are noted within the hazards identified. If a momentous and devastating storm decimated the entire county, then potential dollar costs would probably be based on the "just value figure" which was discussed in Section 3: $780,650,996 (2018 just value of the real property) + $52,922,642 (2018 tangible personal property) = **$833,573,638**.

The hazards profiled within this section can bring different consequences for the Union County's structures, infrastructure, economy and environment. The impact specifics are profiled within each hazard identified. Table 4.3 examines what types of structures and infrastructure would be impacted from the identified natural hazards.

Table 4.3 – Impacts on Union County's Structures and Infrastructure

Impacts on Structures and Infrastructure from Identified Hazards	All Structures	Mobile Homes	Poorly Constructed Homes	Non-Elevated Homes	Telecommunications	Electrical Utilities	Water / Sewer Utilities	Roadways	Waterways	Agriculture	Economic Disruption	Environmental Damage
Flooding	X	X	X	X	X	X	X	X	X	X	X	X
Sinkholes	X	X	X	X		X	X	X	X	X	X	X
Hurricanes/Tropical Storms	X	X	X	X	X	X	X	X	X	X	X	X
Tornadoes	X	X	X	X	X	X		X		X	X	X
Thunderstorms/ Strong Winds		X	X		X	X				X		
Lightning		X	X		X	X				X		
Hailstorms		X	X							X		
Riverine Erosion			X	X					X	X		X
Wildfires	X	X	X	X	X	X		X		X	X	X
Drought							X		X	X	X	X
Heat Wave										X		X
Winter Storms		X	X			X		X	X	X	X	X
Freezing Temperatures		X	X			X		X	X	X	X	X

Natural Hazard Profiling

A critical component in the local mitigation plan is to analyze the natural hazards that face the community. Understanding the risk and consequences on the various hazards is the first part of mitigating the adverse effects of future events.

As stated earlier, profiling each natural hazard will include the following sections:

- ✓ **Hazard Overview** – synopsis of the hazard
- ✓ **Geographic Area** – area in the county with exposure to the hazard
- ✓ **Historical Occurrences** – previous occurrences in terms of frequency

- ✓ **Probability** - the chance of occurrence
- ✓ **Risk and Vulnerability Assessment –** process to identify potential hazards and analyze what could happen
- ✓ **Impact –** the consequences of effects of a hazard on the community and its assets
- ✓ **Extent** – the strength or magnitude

Flooding

A flood is an overflow of water onto normally dry land. The inundation of a normally dry area caused by rising water in an existing waterway, such as a river, stream, or drainage ditch, or the ponding of water at or near the point where the rain fell. Flooding is a longer-term event than flash flooding as it may last for days or even weeks. Several factors determine the severity of floods, including rainfall intensity, rainfall duration, topography, ground cover, and frequency of inundation. Floods are the most common hazard in the United States and the affects can be local, impacting a neighborhood or community, or entire river basins and multiple states.

Due to its inland location, Union County is not subject to coastal flooding, however riverine flooding can occur at the Santa Fe River. The County is prone to inland flooding which is not only a threat due to tropical storms and hurricanes but can also occur from the severe and numerous thunderstorms from the spring to the fall months each year. In the spring, thunderstorms occur when warm troughs push back the cold weather to the north and gathering fuel from the moisture of the gulf. In the summer, short, but severe rains are generated from the heat of the summer day evaporating moisture into the air. In the fall, the cooler weather from the north pushes back the warmer weather and again, gathers fuel from the gulf, creating isolated thunderstorms.

In an undeveloped area, the water runoff system is provided by nature. In ever increasing urban areas flooding has necessitated the need for new and upgrades of existing drainage systems. Stormwater management systems have two purposes: the control of stormwater runoff to prevent or minimize damage to property and physical injury and loss of life which may occur during or after a very infrequent or unusual storm; and the control of stormwater to eliminate or minimize inconvenience or disruption of activity as a result of runoff from more frequently occurring, less significant storms.

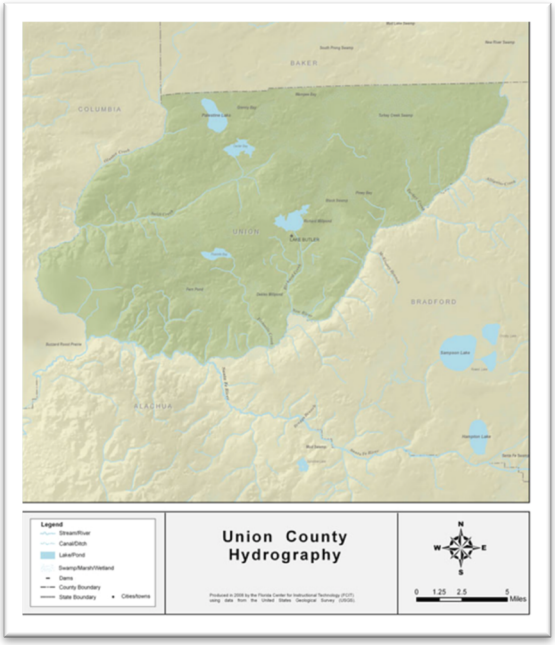
The following are several terms that are relevant to flooding and important for citizens to know:

- ✓ Flood Watch: Flooding is possible. Tune in to NOAA Weather Radio, commercial radio, or television for information.
- ✓ Flash Flood Watch: Flash flooding is possible. Be prepared to move to higher ground; listen to NOAA Weather Radio, commercial radio, or television for information.
- ✓ Flood Warning: Flooding is occurring or will occur soon; if advised to evacuate, do so immediately.

Figure 4.3 is the hydrography map, a type of topographic map, of Union County to reveal the slopes and contours of land. Hydrographic maps are specially made to survey underwater land terrain.

Figure 4.3 – Hydrography Map of Union County, Drainage Patterns

Some areas of Union County are more flood-prone than others. Floodplain maps show those areas of Union County and its municipalities, which are within the 100-year and 500-year floodplain as delineated by the FEMA as part of the National Flood Insurance Program (NFIP). These are areas that have a probability of flooding once every 100-years or 500-years respectively during any given year. The classification of floodplains is due in part to the probability or return rate of a level of water; for instance, 100-year floods are calculated to be the level of flood water expected to be equal or exceeded every 100 years on average. This means that a flood has a 1% chance of being equaled or exceeded in magnitude in any single year; a 500-year floodplain has a 0.2% chance.



Source: http://fcit.usf.edu/florida/maps/pages/11200/f11276/f11276.htm

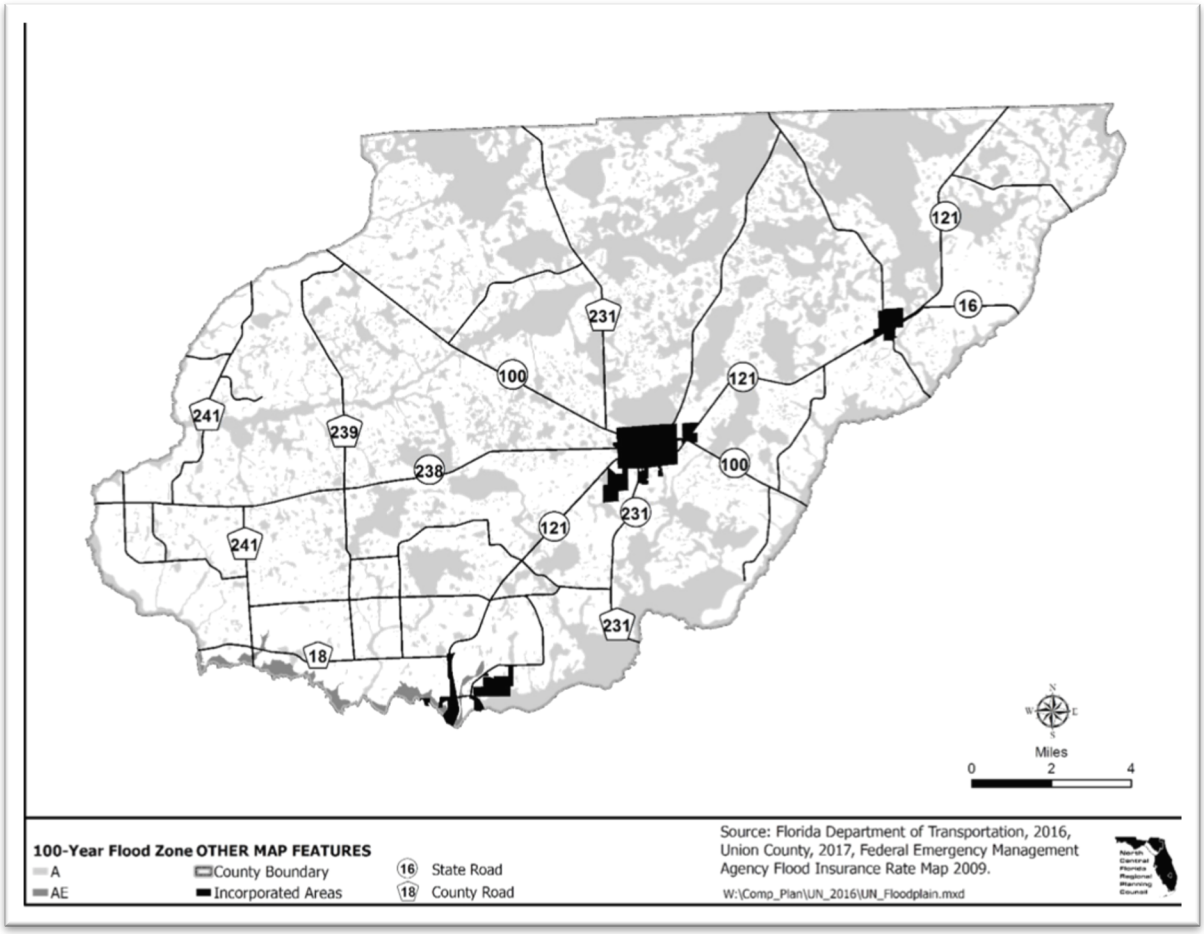
The FEMA FIRM for Union County outlines the selected numbered map areas for the county. The 2018 and 2009 Flood Insurance Rate Maps (FIRM) were reviewed from the FEMA Flood Map Service Center. According to the Union County Building Department, Union County has 42 FEMA Flood Insurance Rate Maps (FIRMs) panels (which includes AE, A and X).

Table 4.4 – Flood Zones Definition

Flood Zones	FEMA Definitions
Zone A	Areas subject to inundation by the 1-percent-annual-chance flood event generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.
Zone AE	Areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply.
Zone X	Areas outside the 0.2- percent annual chance floodplain, areas within the 0.2-percent annual chance floodplain, and to areas of 1-percent annual chance flooding where average depths are less than 1 foot, areas of 1-percent annual chance flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 1-percent annual chance flood by levees. No base flood elevations or depths are shown within this zone.

Figure 4.4 outlines the flood prone areas for the County.

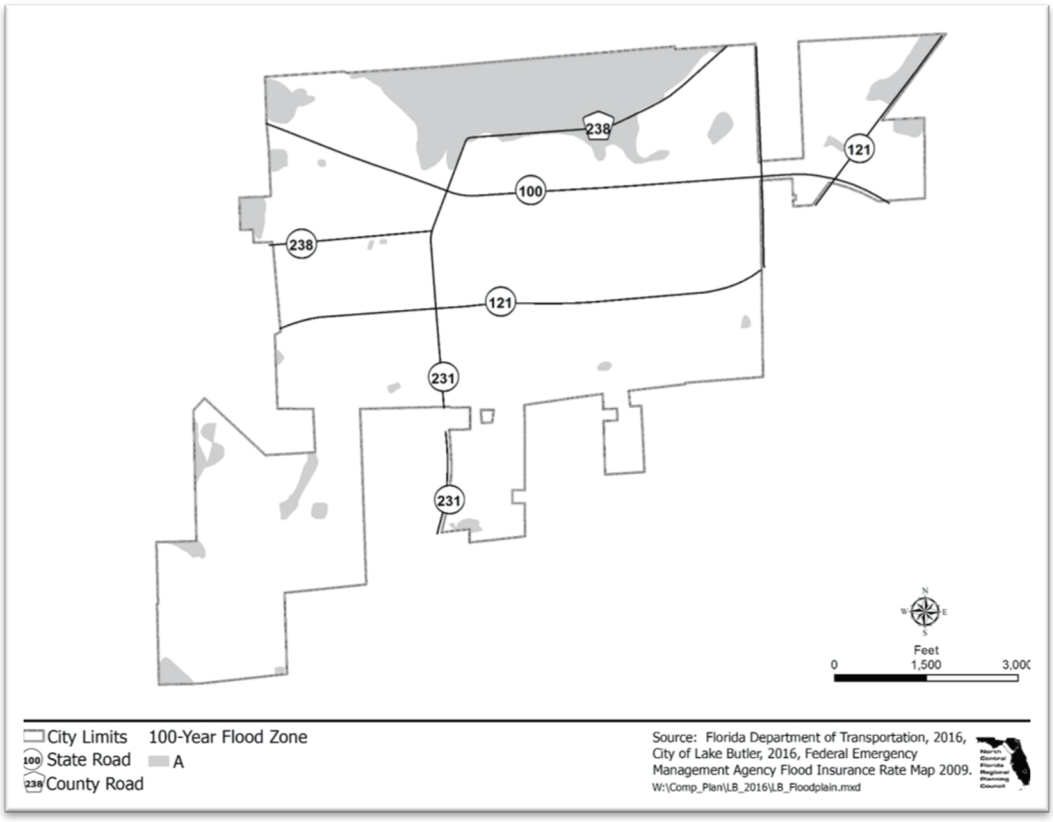
Figure 4.4 – Flood Prone Areas for Union County



Source: Union County Comprehensive Plan, Amended October 15, 2019 by Ordinance No.18-06

Figure 4.5 outlines the flood prone areas for Lake Butler.

Figure 4.5 – Flood Prone Areas in Lake Butler



Source: City of Lake Butler Comprehensive Plan, Amended April 17,2017 by Ordinance No.17-01

Most of the flooding events occur in the northern portion of the City of Lake Butler, the northern unincorporated areas of Union County, the Santa Fe River Basin areas, the Town of Worthington Springs near the Santa Fe River, and the other specific areas noted below.

Table 4.5– Areas of Concern for Flooding Events

Flooding Concern	Area of the County
Junction of SR 100 and New River	Southeastern boundary between Union and Bradford counties
Junction of SR 100 and Olustee Creek	Northwestern boundary of Union and Columbia counties
Junction of SR 121 and Santa Fe River	Southern boundary of Union and Alachua counties
NE 192nd Lane and NE SR 121, NE 3rd Street and NE 1st and 4th Avenues, and NE 1st Street and SW 6th Street (*these are chronic flooding areas)*	City of Lake Butler

NE SR 121 and NE 130th Terrace, NE 233rd Lane and NE SR 121, and NE 260th Loop (*these are chronic flooding areas)*	Town of Raiford
SW 102nd Court, SW 42nd Street, SW SR 121 and E SR 18, SW 119th Loop and SW SR 121, SW 77th Street, SW 78th Lane, SW 66th Terrace, and SW 89th Street (*these are chronic flooding areas)*	Town of Worthington Springs
NE 198th Avenue and NE SR 121, NE 188th Street, NE 198th Avenue, NW 141st Way, NW 126th Avenue, NW 160th Street, NW 99th Avenue, NW 100th Avenue, NW 61st Avenue, NW CR 239, NW CR 241, SW 47th Loop, SW 67th Street, SW 53rd Street, SW 102nd Avenue, SW 100th Place, and SW 40th Terrace (*these are chronic flooding areas)*	Unincorporated Union County

Special Flood Hazard Area (SFHA)

The SFHA is the land area covered by the floodwaters of the base flood on the National Flood Insurance Program (NFIP) maps. The SFHA is the area where the NFIP's floodplain management regulations must be enforced and the area where the mandatory purchase of flood insurance applies. The SFHA's in Union County are land areas that are at high risk for flooding. The SFHA can be identified by several A and V zones, however, Union County has only the following zones: A and AE

There are several areas throughout the county (incorporated and unincorporated) that are identified as zones A and X. The FIRM reveals that the Zone AE area is located in the southern portion of Union County along the Santa Fe River area. Most of the flooding events occur in the northern portion of Lake Butler, the northern unincorporated areas of Union County and in the Santa Fe River Basin areas.

Details from the FEMA Flood Insurance Study (FIS), the Suwannee River Water Management District (SWRMD) and the National Weather Service (NWS)

The Santa Fe River flooding which is caused by overflow and one unnamed tributary to the Santa Fe River with reported flooding problems was studied in detail in the FIS.

Principal Flood Problems

The most severe floods in the Santa Fe basin are associated with storms or sequences of storms that produce widespread distribution of rainfall for several days duration. Flooding occurs in all seasons, but maximum annual stages occur most frequently from February through April as a result of a series of frontal-type rainfall events over the basin. The area is also subject to summer and fall tropical disturbances, occasionally of hurricane intensity. Thunderstorms caused by summer air mass activity produce intense rainfall, but the duration is usually short and aerial distribution is relatively small.

Historical Data

The September 1964 flood was the largest flood of record on the Santa Fe River. The discharge at USGS gage (No. 02321500) in the Town of Worthington Springs (which is located in Union County) measured 20,000 cubic feet per

second (cfs), while the USGS gage (No. 02322500) at the Town of Ft. White (which is located in Columbia County) recorded 17,000 cfs.

In late June 2012, Tropical Storm Debby made landfall through northern Florida. The National Hurricane Center reported torrential rainfalls along the northern counties of Florida. Rainfall totals were generally greater than 10 inches in Union County, with official reports exceeding 20 inches farther west near Lake City in Columbia County. Flooding during the storm produced some of the highest stages on local streams, with the Santa Fe River at Worthington Springs reaching only moderate flood stage.

The National Weather Service also reported minor and moderate flood stage events on the New River in October 2004, March 2004, September 2004, August 2008, July 2012, August 2012, May 2013, and March 2014, and the Santa Fe River in March, 2003, June 2003, August 2003, March 2005, July 2005, December 2005, February 2006, August 2008, May 2009, January 2010, February 2010, July 2012, August 2012, May 2013, July 2013, and September 2014.

Discharges from the largest historical flood at both gage locations are listed below.

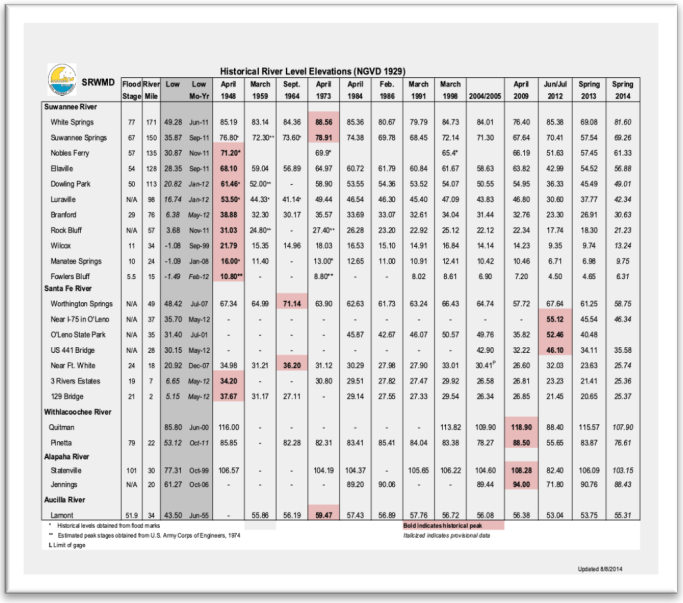
Table 4.6 - Historical Flood Data – Santa Fe River

Location	Peak Discharges (CFS)				
Santa Fe River	1964	1948	1934	1945	1947
At the Town of Worthington Springs	**20,000**	14,900	15,700	15,700	14,900
	1964	1948	1934	1945	1947
Near Fort White	**17,000**	12,300	11,400	9,300	8,110

Source: FEMA Flood Insurance Study for Union County and Incorporated Areas

According to the SRWMD, the historical river elevation for the Santa Fe River is noted in Figure 4.6.

Figure 4.6 – Historical River Level Elevations (NGVD 1929), updated 8/8/2014



Historical River Level Elevations (NGVD 1929)

SRWMD	Flood Stage	River Mile	Low	Low Mo-Yr	April 1948	March 1959	Sept. 1964	April 1973	April 1984	Feb. 1986	March 1991	March 1998	2004/2005	April 2009	Jun/Jul 2012	Spring 2013	Spring 2014
Suwannee River																	
White Springs	77	171	49.28	Jun-11	85.19	83.14	84.36	**88.56**	85.36	80.67	79.79	84.73	84.01	76.40	85.38	69.08	*81.60*
Suwannee Springs	67	150	35.87	Sep-11	76.80*	72.30**	73.60*	**78.91**	74.38	69.78	68.45	72.14	71.30	67.64	70.41	57.54	*69.26*
Nobles Ferry	57	135	30.87	Nov-11	**71.20***			69.9*				65.4*		66.19	51.63	57.45	61.33
Ellaville	54	128	28.35	Sep-11	**68.10**	59.04	56.89	64.97	60.72	61.79	60.84	61.67	58.63	63.82	42.99	54.52	*56.88*
Dowling Park	50	113	20.82	Jan-12	**61.46***	52.00**	-	58.90	53.55	54.36	53.52	54.07	50.55	54.95	36.33	45.49	*49.01*
Luraville	N/A	98	*16.74*	Jan-12	**53.50***	44.33*	41.14*	49.44	46.54	46.30	45.40	47.09	43.83	46.80	30.60	37.77	*42.34*
Branford	29	76	*6.38*	May-12	**38.88**	32.30	30.17	35.57	33.69	33.07	32.61	34.04	31.44	32.76	23.30	26.91	*30.63*
Rock Bluff	N/A	57	3.68	Nov-11	**31.03**	24.80**	-	27.40**	26.28	23.20	22.92	25.12	22.12	22.34	17.74	18.30	*21.23*
Wilcox	11	34	-1.08	Sep-99	**21.79**	15.35	14.96	18.03	16.53	15.10	14.91	16.84	14.14	14.23	9.35	9.74	*13.24*
Manatee Springs	10	24	-1.09	Jan-08	**16.00***	11.40	-	13.00*	12.65	11.00	10.91	12.41	10.42	10.46	6.71	6.98	9.75
Fowlers Bluff	5.5	15	*-1.49*	Feb-12	**10.80****	-	-	8.80**	-	-	8.02	8.61	6.90	7.20	4.50	4.65	6.31
Santa Fe River																	
Worthington Springs	N/A	49	48.42	Jul-07	67.34	64.99	**71.14**	63.90	62.63	61.73	63.24	66.43	64.74	57.72	67.64	61.25	*58.75*
Near I-75 in O'Leno	N/A	37	35.70	May-12	-	-	-	-	-	-	-	-	-	-	**55.12**	45.54	*46.34*
O'Leno State Park	N/A	35	31.40	Jul-01	-	-	-	-	45.87	42.67	46.07	50.57	49.76	35.82	**52.46**	40.48	
US 441 Bridge	N/A	28	30.15	May-12	-	-	-	-	-	-	-	-	42.90	32.22	**46.10**	34.11	35.58
Near Ft. White	24	18	20.92	Dec-07	34.98	31.21	**36.20**	31.12	30.29	27.98	27.90	33.01	30.41*	26.60	32.03	23.63	*25.74*
3 Rivers Estates	19	7	*6.65*	May-12	**34.20**	-	-	30.80	29.51	27.82	27.47	29.92	26.58	26.81	23.23	21.41	*25.36*
129 Bridge	21	2	*5.15*	May-12	**37.67**	31.17	27.11	-	29.14	27.55	27.33	29.54	26.34	26.85	21.45	20.65	*25.37*
Withlacoochee River																	
Quitman			85.80	Jun-00	116.00	-	-	-	-	-	-	113.82	109.90	**118.90**	88.40	115.57	*107.90*
Pinetta	79	22	*53.12*	Oct-11	85.85	-	82.28	82.31	83.41	85.41	84.04	83.38	78.27	**88.50**	55.65	83.87	*76.61*
Alapaha River																	
Statenville	101	30	77.31	Oct-99	106.57	-	-	104.19	104.37	-	105.65	106.22	104.60	**108.28**	82.40	106.09	*103.15*
Jennings	N/A	20	61.27	Oct-06	-	-	-	-	89.20	90.06	-	-	89.44	**94.00**	71.80	90.76	*88.43*
Aucilla River																	
Lamont	51.9	34	43.50	Jun-55	-	55.86	56.19	**59.47**	57.43	56.89	57.76	56.72	56.08	56.38	53.04	53.75	55.31

* Historical levels obtained from flood marks
** Estimated peak stages obtained from U.S. Army Corps of Engineers, 1974
L Limit of gage

Bold indicates historical peak
Italicized indicates provisional data

Updated 8/8/2014

Source - SRWMD: http://www.mysuwanneeriver.com/documentcenter/view/136

Details note that the Santa Fe River near Worthington Springs reached a historical peak level of 71.14 (data obtained from flood marks) in September 1964. Although the exact flood stage level is not noted, the river mile data suggests 49 estimating over 22 feet above the flood stage level for the river.

Historical River Data from the National Weather Service on the Santa Fe River at Worthington Springs

Figure 4.7 – Santa Fe River at Worthington Springs Flood Categories (in feet)

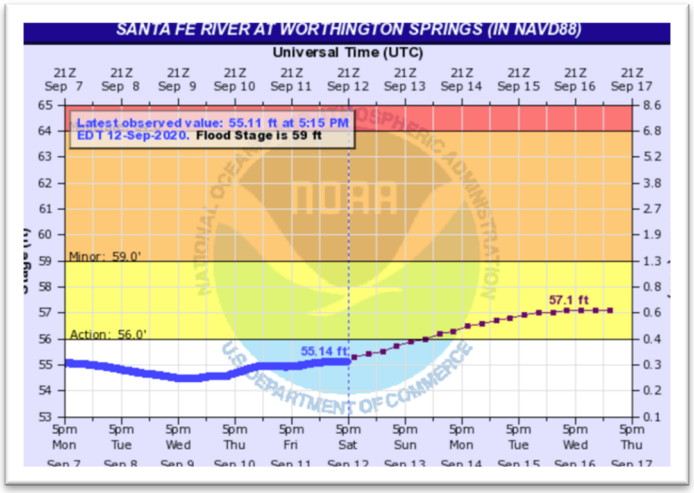
Flood Categories (in feet)

Major Flood Stage:	66
Moderate Flood Stage:	64
Flood Stage:	59
Action Stage:	56
Low Stage (in feet):	49.4

Historic Crests
(1) 71.17 ft on 09/12/2017
(2) 70.31 ft on 09/13/1964
(3) 67.46 ft on 10/05/1992
(4) 66.94 ft on 06/28/2012
(5) 66.85 ft on 10/21/1944
(6) 66.74 ft on 06/17/1934
(7) 66.59 ft on 09/01/1968
(8) 66.52 ft on 10/22/1941
(9) 66.51 ft on 03/12/1948
(10) 66.49 ft on 09/26/1947
Show More Historic Crests

(P): Preliminary values subject to further review.

Recent Crests
(1) 59.93 ft on 01/30/2019
(2) 59.22 ft on 12/23/2018
(3) 60.25 ft on 12/17/2018
(4) 62.09 ft on 08/03/2018
(5) 60.29 ft on 07/25/2018
(6) 59.29 ft on 04/11/2018
(7) 59.61 ft on 01/31/2018
(8) 58.55 ft on 12/12/2017
(9) 58.51 ft on 10/06/2017
(10) 71.17 ft on 09/12/2017



Note: Although the historical data recorded in Union County for Santa Fe River at Worthington Springs reached a historical peak of 71.14 in September 1964 – newer data reveals that there is a new flood stage record of 71.17 on September 12, 2017 from tropical storm and hurricane Irma. Major flooding occurred at this level.

Table 4.7 - Flood Impacts from the Santa Fe River

Feet	Flood Impacts from the Santa Fe River
80.8	Water reaches the top of the SR 121 bridge railing.
78.1	Water begins to flood the SR 121 bridge travel lanes.
72.7	Water reaches the base of the SR 121 bridge.
72.5	Water reaches the approach road surface of SR 121 bridge on the Alachua County Side.
72	The CR 241 bridge at the Alachua Union County line is subject to closure above this level.
69	Additional structures on SW 99th Avenue in Union County flood.
66	A home east of SW 102nd Avenue near 103rd loop in Union County begins to flood.
64	SW 99th Avenue in Union County is subject to closure above this level restricting access to homes near the river. Water begins to approach a couple of residences in the area. Structures south of CR 18 near SW 78th Court begin to flood.
63	SW 99th Avenue in Union County begins to flood.
62	In Union County, flooding expands across farm land south of CR 18 and approaches the road surface about 1 mile east of SW CR 241.
60	A driveway near SW 102nd Court in Union County begins to flood at this level. Flooding along the river continues to impact boat ramps, docks and campgrounds in the area.
59	Chastain-Seay Park in Worthington Springs is generally closed to public as access roads with the park become flooded.
58	Picnic areas and campsites at Chastain-Seay Park in Worthington Springs begin to flood.
56	The boat ramp and floating dock at Chastain-Seay Park in Worthington Springs begin to flood.

Source: NWS; https://water.weather.gov/ahps2/hydrograph.php?gage=worf1&wfo=jax

Historical Flood Occurrences

According to the NCDC, (1/1/1950 – 9/8/2020), there were 4 flood, 3 flash flood, and 4 heavy rain occurrences reported in Union County over the last 70 years with location, date, time, the type of event, if there were any deaths or injuries, and the property and crop damage estimates.

Table 4.8 – Flood Occurrences in Union County – (1/1/1950 – 9/8/2020)

Location or County	Date	Time	Type	Death	Injuries	Property Damage	Crop Damage
Countywide	2/17/1998	2:35	Flash Flood	0	0	0.00K	0.00K
Union (Zone)	3/1/1998	00:01	Flood	0	0	1.34 M	0.00K
Countywide	3/30/2000	15:30	Flash Flood	0	0	2.5K	0.00K
Worthington Springs	7/3/2002	17:30	Flood	0	0	0.00 K	0.00K
Countywide	3/9/2003	11:00	Flash Flood	0	0	0.00K	0.00K
Union (Zone)	9/9/2004	13:00	Flood	0	0	0.00K	0.00K
Worthington Springs	1/21/2010	14:15	Flood	0	0	0.00K	0.00K
Lake Butler	8/4/2016	11:43	Heavy Rain	0	0	0.00K	0.00K
Lake Butler	7/5/2019	16:45	Heavy Rain	0	0	0.00K	0.00K
Worthington	7/24/2019	11:00	Heavy Rain	0	0	0.00K	0.00K
Cliftonville	11/14/2019	06:00	Heavy Rain	0	0	0.00K	0.00K
Totals:	**Property Damage: $1,342,500**						

Source: http://www.ncdc.noaa.gov/stormevents/listevents

Hazard Event Narrative – Extent and Impact

1. 3/1/1998 – 3/31/1998, Union Zone – Several counties in Florida (St. Johns, Baker, Nassau, Union Suwannee, Columbia, Alachua, Marion, Hamilton, Gilchrist, Flagler, Duval, Clay, Bradford and Putnam) were effected int his flooding event. The total flooding data related to El Nino observed more than 2,800 homes and more than 175 businesses were destroyed. The specifics from the NCDC noted for Union County on the 3/1/1998 was $1.34 million in property damage. *However, according to the Emergency Management Department, the March 1998 flood caused major road culvert damage at an approximate cost of $1.8 million in county repairs*. In addition, details from the Times Union, 2/23/1998, reported in Union County, water was across SR 121 in at least four places between Raiford and Worthington Springs and CR 231A, 18A and 239A were also under water.

2. In the July 2002 - Worthington Springs summary, details reveal that flooding occurred on Hwy 796. In the September 2004 flood, numerous roads remain underwater countywide. CR 18 East Bridge at New River is closed due to high water. In January 2010, water flowed over a roadway along SR 18 near SW 155th court causing a car to drive off the road into a ditch where law enforcement and EMS performed a water rescue of a stranded person under water. No injuries were recorded.

3. 3/9/2003 – Countywide – There was widespread flooding of low-lying areas with 27 road and streets flooded and impassable. Four homes flooded and were evacuated in Raiford. Property damage figures were not recorded.

4. 7/24/19 - A public rain gauge measured 4.63 inches of rainfall since noon. Property damage details were not disclosed.

Additional Flood Occurrence Data

9/12/17 – Santa Fe River at Worthington Springs – historical new flood stage record of 71.17 on September 12, 2017 from tropical storm and hurricane Irma. Major flooding occurred at this level.

Risk and Vulnerability Assessment

Flooding events either from a tropical storm, a hurricane or a heavy summer rain, poses a major hazard throughout the county and it is not necessary for development to be in the 100-year floodplain to be at risk. Union County is located on the north central plains of Florida with previous flooding events that have occurred countywide, however, more frequent flooding is located in the Santa Fe Basin area, and the Town of Worthington Springs near the Santa Fe River. With development along the Santa Fe River and their floodplains, numerous structures and roads are at risk from more frequent flood events.

Vulnerability for Union County's Structures, Facilities and Infrastructure

Union County's buildings, infrastructure and critical facilities are considered vulnerable to damage caused by flooding events. Table 4.7 – Flood Impacts from the Santa Fe River describes the vulnerability at water crest levels. Considerable and significant damage could occur if either river crested at peak levels.

Vulnerability for the Union County's Population

The most vulnerable populated area in the county are the citizens living in mobile homes, the older homes, and the poorly constructed homes and are in close proximity to the Santa Fe River. In addition to those that live within the 100-year floodplain areas in Lake Butler and the unincorporated area of the County.

Table 4.9 – Population in 100 and 500 - Year Flood Return Period

Population in 100 and 500 - Year Flood Return Period *(2015 population estimates)*		
County	**100-Year Flood**	**500-Year Flood**
Union	202	301

Source: Florida Division of Emergency Management, GIS Department,
Data for the State of Florida Enhanced Hazard Mitigation Program, 2018

Table 4.10 – Economic Loss for Buildings by Return Period

Direct Economic Loss for Buildings for Union County by Return Period (in dollars)		
County	**100-Year Flood**	**500-Year Flood**
Union	$2,203,000	$3,258,000

Source: Florida Division of Emergency Management, GIS Department,
Data for the State of Florida Enhanced Hazard Mitigation Program, 2018

Table 4.11 – Inland Flood Hazard Sum of County Facilities

Inland Flood Hazard Sum of Union County Facilities						
Floodplain	Hospitals	Fire Stations	Police Stations	Schools	Other	Totals
100	0	1	0	1	7	**9**
500	0	7	0	8	7	**19**

Source: Florida Division of Emergency Management, GIS Department,
Data for the State of Florida Enhanced Hazard Mitigation Program, 2018

Table 4.12 – Inland Flood Hazard Value of County Facilities

Inland Flood Hazard Value of Union County Facilities (in dollars)						
Floodplain	Hospitals	Fire Stations	Police Stations	Schools	Other	Totals
100	0	38,487	0	1,419,000	1,604,041	**$3,061,528**
500	0	1,476,175	0	1,419,000	1,604,041	**$4,499,216**

Source: Florida Division of Emergency Management, GIS Department,
Data for the State of Florida Enhanced Hazard Mitigation Program, 2018

Table 4.13 – Inland Flood Hazard Building Economic Count

Inland Flood Hazard Building Economic Count 100-year and 500-year Floodplain for Union County								
Floodplain	Residential	Commercial	Medical	Industrial	Agriculture	Education	Government	Totals
100	552	16	0	30	887	0	6	**1,507**
500	0	0	0	0	6	0	0	**6**

Source: Florida Division of Emergency Management, GIS Department,
Data for the State of Florida Enhanced Hazard Mitigation Program, 2018

Table 4.14 – Inland Flood Hazard Building Economic Values

Inland Flood Hazard Building Economic Values 100-year and 500-year Floodplain for Union County								
Flood -plain	Residential	Commercial	Medical	Industrial	Agriculture	Education	Government	Totals
100	36,408,507	1,746,129	0	2,890,838	496,779,816	59,000	119,094,903	**$658,725,322**
500	0	0	0	0	1,348,958	0	88,730	**$1,437,688**

Source: Florida Division of Emergency Management, GIS Department,
Data for the State of Florida Enhanced Hazard Mitigation Program, 2018

Summary details for flooding events:

<table>
<tr><td>Probability of Future Occurrences</td><td>There is a high probability (at least 1 occurrence every year) that Union County will continue to experience flooding associated with large tropical storms, powerful hurricanes, and heavy rainfall that generally occur between June and October.</td></tr>
<tr><td>Geographic Area</td><td>The entire planning area (the incorporated and unincorporated areas of Union County) is at high risk to flooding events. Specific areas that are considered susceptible to chronic flooding are the following locations:
<table>
<tr><td>Junction of SR 100 and New River</td><td>Southeastern boundary between Union and Bradford counties</td></tr>
<tr><td>Junction of SR 100 and Olustee Creek</td><td>Northwestern boundary of Union and Columbia counties</td></tr>
<tr><td>Junction of SR 121 and Santa Fe River</td><td>Southern boundary of Union and Alachua counties</td></tr>
<tr><td>NE 192nd Lane and NE SR 121, NE 3rd Street and NE 1st and 4th Avenues, and NE 1st Street and SW 6th Street (these are chronic flooding areas)</td><td>City of Lake Butler</td></tr>
<tr><td>NE SR 121 and NE 130th Terrace, NE 233rd Lane and NE SR 121, and NE 260th Loop (these are chronic flooding areas)</td><td>Town of Raiford</td></tr>
<tr><td>SW 102nd Court, SW 42nd Street, SW SR 121 and E SR 18, SW 119th Loop and SW SR 121, SW 77th Street, SW 78th Lane, SW 66th Terrace, and SW 89th Street (these are chronic flooding areas)</td><td>Town of Worthington Springs</td></tr>
<tr><td>NE 198th Avenue and NE SR 121, NE 188th Street, NE 198th Avenue, NW 141st Way, NW 126th Avenue, NW 160th Street, NW 99th Avenue, NW 100th Avenue, NW 61st Avenue, NW CR 239, NW CR 241, SW 47th Loop, SW 67th Street, SW 53rd Street, SW 102nd Avenue, SW 100th Place, and SW 40th Terrace (these are chronic flooding areas)</td><td>Unincorporated Union County</td></tr>
</table></td></tr>
<tr><td>Extent</td><td>The worse-case scenario for flooding in Union County was the September 12, 2017 (hurricane/tropical storm flood) on the Santa Fe River at Worthington Springs. Details note that the Santa Fe River near Worthington Springs reached a historical peak level of 71.17 (data obtained from flood marks). Property damage or other additional details from this occurrence were not available.

Other noted flooding events reported:

✓ In February 1998, water was across SR 121 in at least four places between Raiford and Worthington Springs and CR 231A, 18A and 239A were under water.
✓ In March 1998 flood caused major road culvert damage at an approximate cost of $1.8 million in county repairs.
✓ In July 2002, details reveal that flooding occurred on Hwy 796.</td></tr>
</table>

	✓ In September 2004 flood, numerous roads remain underwater countywide. CR 18 East Bridge at New River is closed due to high water. ✓ In January 2010, water flowed over a roadway along SR 18 near SW 155th court causing a car to drive off the road into a ditch where law enforcement and EMS performed a water rescue of a stranded person under water.
Impact	Depending on crest levels of the rivers, Impact specifics in Tables 4.7 – Impact details from the Santa Fe River, significant structural and infrastructure damage would occur. 1998 The specifics from the NCDC noted for Union County on the 3/1/1998 was $1.34 million in property damage. However, according to the Emergency Management Department, the March 1998 flood caused major road culvert damage at an approximate cost of $1.8 million in county repairs. In addition, details from the Times Union, 2/23/1998, reported in Union County, water was across SR 121 in at least four places between Raiford and Worthington Springs and CR 231A, 18A and 239A were also under water. The flooding events impacting Union County, and the damages they have caused suggest that the future impacts could include: ➢ Road closures due to the roads remain under water for a period of time; ➢ Bridge closures due to high water; ➢ Water rescue for stranded residents due to flooding; ➢ Significant culvert damage; ➢ Possible power outages; and ➢ Damage to the mobile homes, poorly constructed and non-elevated homes. In addition, there could be an economic or financial impact with results that would be devastating from a large-scale flood event not only during the crisis phase, which immediately follows the event, yet through the recovery and rebuilding stages.

Sinkhole

A sinkhole is a natural depression or hole in the Earth's surface caused by karst processes — the chemical dissolution of carbonate rocks or suffosion processes for example in sandstone. Sinkholes may vary in size from less than 1 to 600 meters (3.3 to 2,000 ft) both in diameter and depth and vary in form from soil-lined bowls to bedrock-edged chasms. They may be formed gradually or suddenly and are found worldwide.

Sinkholes are a common feature of Florida's landscape. They are only one of many kinds of karst landforms, which include caves, disappearing streams, springs, and underground drainage systems, all of which occur in Florida. Dissolution of carbonate rocks begins when they are exposed to acidic water. Most rainwater is slightly acidic and usually becomes more acidic as it moves through decaying plant debris.

Limestone in Florida is porous, allowing the acidic water to percolate through their strata, dissolving some limestone and carrying it away in solution. Over time, this persistent erosion process has created extensive underground voids and drainage systems in much of the carbonate rocks throughout the state. Collapse of overlying sediments into the underground cavities produces sinkholes.

Although a sinkhole can form without warning, specific signs can signal potential development:

- ✓ Slumping or falling fence posts, trees or foundations;
- ✓ Sudden formation of small ponds;
- ✓ Wilting vegetation;
- ✓ Discolored well water; and/or
- ✓ Structural cracks in walls, floors.

According to the SRWMD and the U.S. Geological Survey

There are many types of sinkholes, but the two occurring most often within the SRWMD are *collapse* and *solution* sinkholes.

A collapse sinkhole forms suddenly as the weight of the overlying soil suddenly becomes too great, and the earth collapses until it fills the limestone cavity. At land surface, a circular hole appears, which may or may not contain water.

Factors that may contribute to the collapse include:

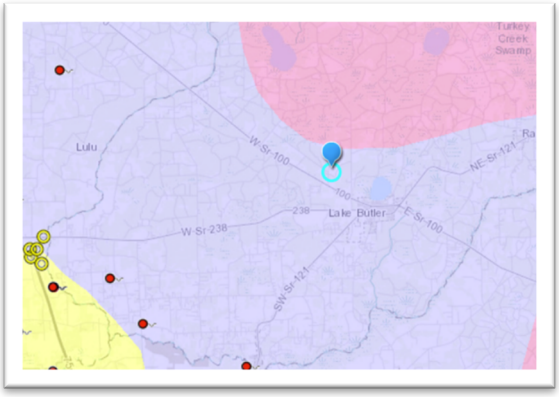
- Large changes in the water table caused by too much or little rain;
- Drilling a well into the cavity;
- Pumping groundwater from near the cavity;
- Constructing buildings above the cavity; and
- Diverting drainage to the areas where a cavity exists.

A solution sinkhole, on the other hand, develops slowly and continuously. It forms where sand or other relatively thin materials slowly and steadily sprinkle downward to fill the cracks and joints that occur in the underground limestone layers. As a sinkhole gets bigger, it collects more surface water and runoff, which commonly carries sand, silt and clay particles. This material can sometimes plug the sinkhole, thereby creating a lake or pond. Lakes that once were collapse sinkholes can sometimes unplug and drain into the underground aquifer. If the lake becomes polluted, this can be a health hazard to the people whose drinking water wells tap into the connected aquifer.

Historical Sinkhole Occurrences

There are two areas located in the County that have swallets. Note, the reference in this map is used as an approximation of the possibility of nearby regulated features. See Figure 4.8.

Figure 4.8 – Swallets in Union County



Source: https://ca.dep.state.fl.us/mapdirect/?focus=fgssinkholes

Details from Figure 4.8:

- ✓ Bivin's Swallet: The first located further W is at latitude 29.97865 °; longitude -82.52515°
  Depth: 0.656168 feet deep; Width: 2.46063 feet wide
  DATEVIS: 12/27/2005; DATEIN: 5/21/2006

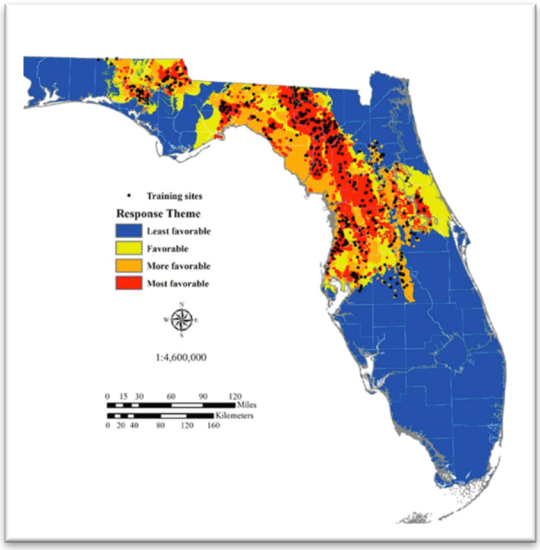
- ✓ Dee's Sink: The second located further SW is at latitude: 29.95039 °; longitude: -82.50193 °
  Depth: 4.921 feet deep; Width: 6.56168 feet wide
  DATEVIS: 11/16/2005; DATEIN: 5/21/2006

Research and evaluation from FDEP on sinkhole events in Union County conclude there have been no occurrences within the update period or since the previous LMS update.

Sinkhole Study – The Favorability of Florida's Geology to Sinkhole Formation

Figure 4.9 – Highly Favorable Sinkhole Formation Map

In August 2013, the Florida Geological Survey, in conjunction with the Florida Division of Emergency Management, a federal grant to conduct a statewide assessment of sinkhole vulnerability over a three-year period with geologists conducting a one-year pilot study in Hamilton, Suwannee and Columbia counties. Although the initial study is for the three counties, the vulnerability for all the counties in Florida will be available after a statewide map is produced. This will then be an additional resource for Union County.



Map Source: The Favorability of Florida's Geology to Sinkhole Formation

In June 2017 the study was completed. FDEM included the results in the 2018 State Hazard Mitigation Plan, Appendix H: Sinkhole Report. Conclusions noted in the study state… "A WofE model was successfully used to map the favorability of Florida's geology to sinkhole formation for use as a tool for developing hazard mitigation strategies.

The results of this model do not suggest that any given area may or may not have a sinkhole. Instead, this model identifies areas of the state that have the favorable geology for sinkhole formation in large numbers during significant triggering events such as a large rainfall preceded by a prolonged drought, or an event where the water level in the aquifer is abruptly changed due to pumping activities."

The assessment will assist planners, builders and environmental regulators for the improvement of health and safety for the populated areas as well as economic benefits.

Risk and Vulnerability Assessment

As concluded by The Favorability of Florida's Geology to Sinkhole Formation report… "Florida is underlain by several thousand feet of carbonate rock, limestone and dolostone, with a variably thick mixture of sands, clays, shells, and other near surface carbonate rock units, called overburden. Those several thousand feet of carbonate rocks are host to one of the world's most productive aquifers, the Floridan aquifer system. Erosional processes, physical and chemical, have acted upon these carbonate rocks as water flows through them creating fissures and cavities within the rock. Those erosional processes have created Florida's karst topography, which is characterized by the presence of sinkholes, swallets, caves (wet and dry), submerged conduits, springs, and disappearing / reappearing streams. In June 2012, Florida experienced a mass sinkhole event triggered by record rainfall from Tropical Storm Debby following an extended period of drought. This event led to the formation of hundreds of collapse sinkholes across the state, which resulted in highway and residential road closures, evacuations of homes, and closure of buildings."

In evaluating specifics from the sinkhole study there are a couple of small areas within the county with some favorability of sinkhole formation in the very southern portion and south western area of the County as reference in Figure 4.8.

Vulnerability for Union County's Structures, Facilities and Infrastructure

Union County's buildings, infrastructure and critical facilities are not considered vulnerable to damage caused by sinkhole events as identified in Figure 4.8.

Vulnerability for the Union County's Population

From the Sinkhole Formation Report it depicts areas in the State with favorable sinkhole formation. The population of residents that live in the very southern area of the County are at some type of risk.

Summary details for sinkhole events:

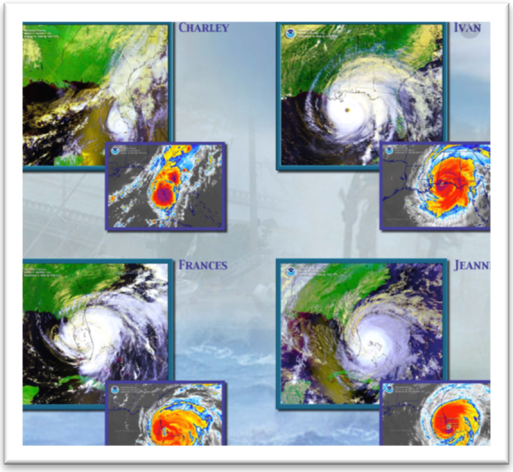
Probability of Future Occurrences	The probability of sinkholes is low (at least 1 occurrence every 10 years) for the very southern and southwestern portion of the unincorporated areas of the County.
Geographic Area	The very southern and southwestern portion of the unincorporated areas of the County has a couple of areas with some favorability to sinkhole events, however, the risk is considered low.
Extent	The worse-case scenario would be a large cover-collapsed sinkhole that could reach the approximate measurements of: 100+ ft. in length, 50+ ft. in width, and 35 ft. in depth from the ground surface down to the water surface. "If" a sinkhole were to open in the very southern and south western areas in Union County, the county could expect in future events, a large cover-collapse sinkhole based on the data in Figure 4.9. Details from Figure 4.8 reveal that the swallet identified, Dee's Sink: The second located further SW is at latitude: 29.95039 °; longitude: -82.50193 °: Depth: 4.921 feet deep; Width: 6.56168 feet wide.

Impact	While highly unlikely due to the geology of Union County, if a sinkhole were to open in the county, it would possibly be a cover-collapse sinkhole, and as noted in the extent area, the magnitude could be considerable and have disastrous affects and impact for the community, the residents, structures, the infrastructure, and/or the critical facilities. Long periods of drought followed by heavy rains can exacerbate the formation of sinkholes. Development increases the use of water, altering drainage pathways, redistributing ground soil, and overloading the surface. Even though they are can have very localized structural impacts, the destruction can have far reaching effects on ground water resources and can change the water chemistry and rates of recharge or run-off in the county. Figure 4.9, the favorability for potential sinkhole formation is located in the unincorporated, unpopulated areas in the County. A future sinkhole event example depending upon the location, the effects could be potentially disastrous as a significant sinkhole with roads, well water and sewer piping, telecommunication lines, electrical utilities and other infrastructure.

Hurricane/Tropical Storms

Figure 4.10 – Four Hurricanes in 2004

According to NOAA… "hurricanes, known broadly as tropical cyclones, are rotating systems of clouds and thunderstorms that form over tropical or subtropical waters. One of nature's most powerful storms, hurricanes can bring strong winds, storm surge flooding, heavy rainfall that can lead to inland flooding, tornadoes, and rip currents."



Source: NOAA

A hurricane is a category of tropical cyclone characterized by thunderstorms and defined surface wind circulation. Hurricanes develop over warm waters and are caused by the atmospheric instability created by the collision of warm air with cooler air. Hurricane winds blow in a large spiral around a calm center, which can be 20-30 miles wide.

A tropical storm is a tropical cyclone with maximum sustained winds of at least 39 mph and is classified as a hurricane once winds goes up to 74 miles per hour or higher. Tropical storms are given official names once they reach these wind speeds. When the wind speeds reach 74 mph or greater, a tropical storm is called a hurricane, typhoon, or cyclone based on the storm location.

The Saffir-Simpson Hurricane Wind Scale is a 1 to 5 rating based on a hurricane's sustained wind speed. This scale estimates potential property damage. Hurricanes reaching Category 3 and higher are considered major hurricanes because of their potential for significant loss of life and damage. Category 1 and 2 storms are still dangerous, however, and require preventative measures. In the western North Pacific, the term "super typhoon" is used for tropical cyclones with sustained winds exceeding 150 mph. See Figure 4.11, the Saffir-Simpson Hurricane Wind Scale for specifics on

a hurricane's sustained wind speed.

Figure 4.11 - Saffir-Simpson Hurricane Wind Scale

Category	Sustained Winds	Types of Damage Due to Hurricane Winds
Í	74-95 mph 64-82 kt 119-153 km/h	**Very dangerous winds will produce some damage:** 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.
2	96-110 mph 83-95 kt 154-177 km/h	**Extremely dangerous winds will cause extensive damage:** 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.
3 (major)	111-129 mph 96-112 kt 178-208 km/h	**Devastating damage will occur:** 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.
4 (major)	130-156 mph 113-136 kt 209-251 km/h	**Catastrophic damage will occur:** 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.
5 (major)	157 mph or higher 137 kt or higher 252 km/h or higher	**Catastrophic damage will occur:** 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.

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

Hurricanes are a seasonal occurrence, with the Atlantic Coast/Gulf of Mexico hurricane season ranging from June 1 to November 30. Although it is rare, tropical storm and hurricane systems may develop outside of the hurricane season. Hurricanes pose a significant threat to Florida, particularly those residents living along the coast.

What Makes a Hurricane Season Active

According to NOAA, Science fact sheet…"Atlantic hurricanes, also called Atlantic tropical cyclones, are intense storms that occur over the North Atlantic Ocean, Caribbean Sea and Gulf of Mexico. Whether an Atlantic hurricane season is active or quiet generally depends upon the large-scale atmospheric and oceanic environment within the main development region, which spans the tropical North Atlantic Ocean and Caribbean Sea."

The conditions, which typically are associated with an active Atlantic hurricane season - and can also produce a more intense hurricane include:

- ✓ warmer tropical North Atlantic sea surface temperatures (SSTs);
- ✓ increased thunderstorm activity; and
- ✓ reduced vertical wind shear (changes of wind direction and/or speed with height) within the main development region, among other features.

Tropical Depression to a Tropical Storm

After a group of thunderstorms for a period of time have come together under the right atmospheric conditions, they organize into a tropical depression. The wind speed near the center are between 20 - 34 knots (23 to 39 mph). After a tropical depression has intensified to the point where its maximum sustained winds are between 35-64 knots (39-73 mph), it then becomes a tropical storm. It is at this time that it is assigned a name. During this time, the storm itself becomes more organized and begins to become more circular in shape -- resembling a hurricane.

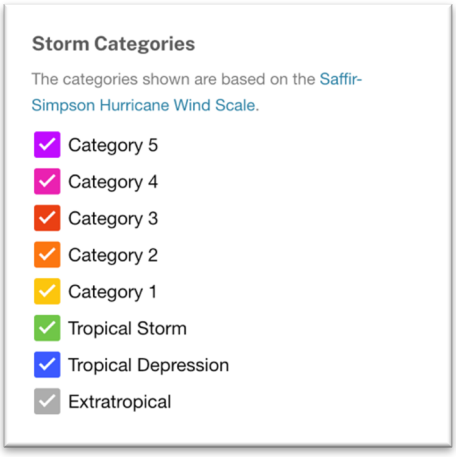


Figure 4.12 – Key code for Historical Tracks

Details displayed in Figure 4.14, that Union County has experienced tropical storms (in green), and hurricane categories 2, 3, and 4 identified (in orange, red, and pink).

Figure 4.13 – Historical Hurricane Tracks (1853 – 1964)

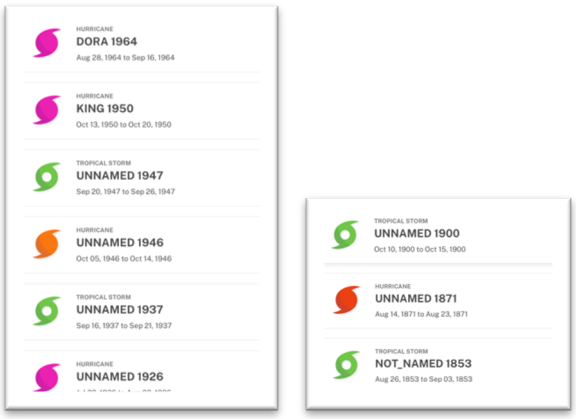
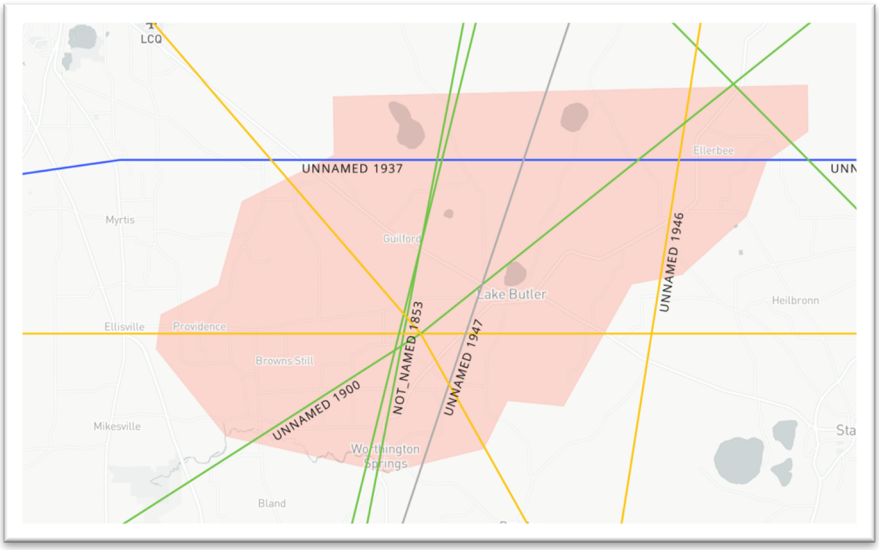


Figure 4.14 – Historical Tracks of Hurricanes and Tropical Storms over the last 167 years for Union County



Source: NOAA, National Ocean Service; https://coast.noaa.gov/hurricanes/#map=10.06/30.0316/-82.3593&search=eyJzZWFyY2hTdHJpbmciOiJVbmlvbiBDb3VudHksIEZsb3JpZGEsIFVTQSIsInNlYXJjaFR5cGUiOiJnZW9jb2RlZCIsIm9zbUlEIjoiMTIxMDc0NSIsImNhdGVnb3JpZXMiOlsiSDUiLCJINCIsIkgzIiwiSDIiLCJIMSIsIlRTIiwiVEQiLCJFVCJdLCJ5ZWFycyI6W10sIm1vbnRocyI6W10sImVuc28iOltdLCJwcmVzc3VyZSI6eyJyYW5nZSI6WzAsMTE1MF0sImluY2x1ZGVVbmtub3duUHJlc3N1cmUiOnRydWV9LCJidWZmZXJVbmI0IjpbIk1pbGVzIl0sInNvcnRTZWxlY3Rpb24iOnsidmFsdWUiOiJ5ZWFyc19uZXdlc3QiLCJsYWJlbCI6IlllYXIgKE5ld2VzdCkifSwiYXBwbHlUb0FPSSI6dHJ1ZSwiaXNTdG9ybUxhYmVsc1Zpc2libGUiOnRydWV9

Union County is not a coastal county but is still subject to the wind and water damage that hurricanes can bring, although to a lesser extent than a coastal Florida county.

Historical Hurricane and Tropical Storm Occurrences

There were 6 recorded tropical storm events reported in Union County per the NCDC (1/1/1950 – 9/8/2020) over the last 70 years. Some of the tropical storms were the result of a hurricane event heading inward onto land.

Table 4.15 – Tropical Storm Occurrences in Union County (1/1/1950 – 9/8/2020)

Location or County	Date	Time	Type	Death	Injuries	Property Damage	Crop Damage
Union (Zone)	9/4/2004	21:00	Tropical Storm	0	0	0.00K	0.00K
Union (Zone)	9/25/2004	12:00	Tropical Storm	0	0	0.00K	0.00K
Union (Zone)	6/13/2006	06:00	Tropical Storm	0	0	0.00K	0.00K
Union (Zone)	8/21/2008	16:00	Tropical Storm	0	0	0.00K	0.00K
Union (Zone)	9/10/2017	12:00	Tropical Storm	0	0	0.00K	0.00K
Union (Zone)	9/10/2017	23:00	Tropical Storm	0	0	0.00K	0.00K
Totals:							**N/A**

Source: http://www.ncdc.noaa.gov/stormevents/listevents

Hazard Event Narrative – Extent and Impact

1. 8/21/2008 – Union (Zone) – Tropical Storm Fay moved slowly north out of the Caribbean Sea, then cut across south and central Florida into the Atlantic Ocean. Fay then slowly curved west and made landfall in the vicinity for Flagler Beach and Daytona Beach on August 21st. Areal flooding occurred over much of the northeast Florida with roads and small creeks flooded. Many North Florida creeks and rivers experienced significant flooding including the Santa Fe River. The detailed specifics regarding the tropical storm for Union County was not noted on the NCDC link for this event. In addition, no injuries or property damage totals were reported.

2. 9/10/2017 – Union (Zone) – Tropical Storm (Hurricane Irma); Hurricane Irma's eye passed west of the local forecast area in Jacksonville, with the region on the storm's turbulent east side. Widespread tropical storm force winds with gust to hurricane force were felt across much of the area. Santa Fe at Worthington Springs set a record flood stage at 71.17 feet on September 12, 2017 with significant flooding at this level. On 9/11/17, the public reported power lines down on SW 8th Street in Lake Butler. Storm total rainfall included 9.62 inches 0.9 miles NE of Raiford.

Additional Hurricane and Tropical Storm Occurrences (Disaster Declarations)

Table 4.16 - Disaster Declarations for Union County Due to Hurricane and Tropical Storm Events

IA, PA or both	Date – Incident Period	Disaster Event	Incident Type	Declaration #
PA	August 11 - 30, 2004	Hurricane Charley and Tropical Storm Bonnie	Hurricane	1539
IA, PA	September 3 – October 8, 2004	Hurricane Frances	Hurricane	1545
IA, PA	September 24 – November 17, 2004	Hurricane Jeanne	Hurricane	1561
PA	August 29 – October 1, 2005	Hurricane Katrina Evacuation	Hurricane	3220
PA	August 18 – September 12, 2008	Tropical Storm Fay	Severe Storm(s)	3288
PA	August 18 – September 12, 2008	Tropical Storm Fay	Severe Storm(s)	1785
IA, PA	June 23 – July 26, 2012	Tropical Storm Debby	Severe Storm(s)	4068
PA	August 31 – September 11, 2016	Hurricane Hermine	Hurricane	4280
IA, PA	September 4 – October 18, 2017	Hurricane Irma	Hurricane	4337
PA	September 4 – October 18, 2017	Hurricane Irma	Hurricane	3385
PA	October 7 – October 19, 2018	Hurricane Michael	Hurricane	3405
PA	August 28 – September 9, 2019	Hurricane Dorian	Hurricane	3419

Data comparison from NCDC, NOAA data in Table 4.15 to the FEMA Disaster Declaration site in Table 4.16 reveals that none of the hurricanes events were recorded in the NCDC county data even though IA and PA was requested by the County. According to the NCDC, NOAA Storm Event Data for Hurricanes and Tropical Storms January 1, 1950 – September 8, 2020, there were 6 tropical storms documented in Union County.

Risk and Vulnerability Assessment

According to NOAA…."Every mile of the U.S. Gulf and East coast is vulnerable to a hurricane, but there are locations that have higher odds of being hit any given year." Union County is an inland county, however, over the last 15 years, the County has experienced damage from strong winds and flooding events and required IA, PA or both.

Vulnerability for Union County's Structures, Facilities and Infrastructure

Union County's public and private buildings, infrastructure, critical facilities, and some framed homes depending on zone location, and especially the mobile homes in the county are vulnerable to hurricane and tropical storm events. The recorded data for the number of mobile homes in the county is 46% of the housing stock or 1,178 homes located primarily in the unincorporated area and the City of Lake Butler. These mobile homes located throughout the county are particularly vulnerable to violent wind damage, which could occur from a major hurricane or tropical storm. The entire county is very vulnerable to heavy and widespread torrential rains, flooding, tornadoes, and lightning strikes which can come from hurricanes and tropical storm events. When strong winds strike populated areas or critical facilities, they can be disastrous.

Vulnerability for the Union County's Population

The County's entire population is vulnerable to a powerful, Category 3 or greater hurricane. The most vulnerable populations include the elderly persons, small children, chronic invalids, the poor and those residing in mobile homes.

Table 4.17 – Probabilistic Hurricane Wind Count of Structures within the Return Period Areas

Probabilistic Hurricane Wind Count of Structures within Return Period Areas							
	10-Year	20-Year	50-Year	100-Year	200-Year	500-Year	1000-Year
Union	2	5	44	195	522	1,245	1,880

Source: Florida Division of Emergency Management, GIS Department,
Data for the State of Florida Enhanced Hazard Mitigation Program, 2018

Table 4.18 – Probabilistic Hurricane Wind Value of Structures within the Return Period Areas

Probabilistic Hurricane Wind Value of Structures Damaged within Return Period Areas (in dollars)							
	10-Year	20-Year	50-Year	100-Year	200-Year	500-Year	1000-Year
Union	$39,000	$549,000	$2,991,000	$6,524,000	$12,089,000	$27,670,000	$51,136,000

Source: Florida Division of Emergency Management, GIS Department,
Data for the State of Florida Enhanced Hazard Mitigation Program, 2018

Table 4.19 – Direct Economic Loss for Buildings by Return Period Areas

Direct Economic Loss for Buildings by Return Period by County (in dollars)							
	10-Year	20-Year	50-Year	100-Year	200-Year	500-Year	1000-Year
Union	$39,064	$549,390	$3,151,351	$6,939,700	$13,183,623	$31,057,886	$58,851,353

Source: Florida Division of Emergency Management, GIS Department,
Data for the State of Florida Enhanced Hazard Mitigation Program, 2018

Table 4.20 – Probabilistic Hurricane Wind 10-Year, Economic Value

Probabilistic Hurricane Wind 10-Year – Total Economic Value by County (in dollars)						
	Tropical Storm	Category 1	Category 2	Category 3	Category 4	Category 5
Union	$928,788,204	$0	$0	$0	$0	$0

Source: Florida Division of Emergency Management, GIS Department,
Data for the State of Florida Enhanced Hazard Mitigation Program, 2018

Table 4.21 – Probabilistic Hurricane Wind 20-Year, Economic Value

Probabilistic Hurricane Wind 20-Year – Total Economic Value by County (in dollars)						
	Tropical Storm	Category 1	Category 2	Category 3	Category 4	Category 5
Union	$928,788,204	$0	$0	$0	$0	$0

Source: Florida Division of Emergency Management, GIS Department,
Data for the State of Florida Enhanced Hazard Mitigation Program, 2018

Table 4.22 – Probabilistic Hurricane Wind 50-Year, Economic Value

Probabilistic Hurricane Wind 50-Year – Total Economic Value by County (in dollars)						
	Tropical Storm	Category 1	Category 2	Category 3	Category 4	Category 5
Union	$0	$928,788,204	$0	$0	$0	$0

Source: Florida Division of Emergency Management, GIS Department,
Data for the State of Florida Enhanced Hazard Mitigation Program, 2018

Table 4.23 – Probabilistic Hurricane Wind 100-Year, Economic Value

Probabilistic Hurricane Wind 100-Year – Total Economic Value by County (in dollars)						
	Tropical Storm	Category 1	Category 2	Category 3	Category 4	Category 5
Union	$0	$928,788,204	$0	$0	$0	$0

Source: Florida Division of Emergency Management, GIS Department,
Data for the State of Florida Enhanced Hazard Mitigation Program, 2018

Table 4.24 – Probabilistic Hurricane Wind 200-Year, Economic Value

Probabilistic Hurricane Wind 200-Year – Total Economic Value by County (in dollars)						
	Tropical Storm	Category 1	Category 2	Category 3	Category 4	Category 5
Union	$0	$0	$928,788,204	$0	$0	$0

Source: Florida Division of Emergency Management, GIS Department,
Data for the State of Florida Enhanced Hazard Mitigation Program, 2018

Table 4.25 – Probabilistic Hurricane Wind 500-Year, Economic Value

Probabilistic Hurricane Wind 500-Year – Total Economic Value by County (in dollars)						
	Tropical Storm	Category 1	Category 2	Category 3	Category 4	Category 5
Union	$0	$0	$928,788,204	$0	$0	$0

Source: Florida Division of Emergency Management, GIS Department,
Data for the State of Florida Enhanced Hazard Mitigation Program, 2018

Table 4.26– Probabilistic Hurricane Wind 1000-Year, Economic Value

Probabilistic Hurricane Wind 1000-Year – Total Economic Value by County (in dollars)						
	Tropical Storm	Category 1	Category 2	Category 3	Category 4	Category 5
Union	$0	$0	$0	$928,788,204	$0	$0

Source: Florida Division of Emergency Management, GIS Department,
Data for the State of Florida Enhanced Hazard Mitigation Program, 2018

Summary details for hurricane and tropical storm events:

Probability of Future Occurrences	The probability of hurricane and tropical storm events is median (at least 1 occurrence every 3 years) to potentially high (at least 1 occurrence every 1 year).
Geographic Area	The entire planning area (the City of Lake Butler, the Town of Worthington Springs, the Town of Raiford and unincorporated areas of Union County) is at high risk to hurricane and/or tropical storm events.
Extent	The worse-case scenario for Union county would be a Category 5 hurricane with winds of over 157 mph or higher, a large percentage of framed homes would be destroyed, fallen trees and power poles would isolate residential areas, and power outages would last for weeks to possibly months. Most of the county would be uninhabitable for weeks or months.

	In reviewing the hurricane and tropical storm track map in Figures 4.13 and 4.14 the data reveals that Union County experienced (7) of the following Category 4 hurricanes (130 – 156 mph): ✓ Hurricane Dorian – 8/28/2019 – 9/9/2019 ✓ Hurricane Irma – 9/4/2017 – 10/18/2017 ✓ Hurricane Frances – 9/3/2004 – 10/8/2004 ✓ Hurricane Charley – 8/11/2004 – 8/30/2004 ✓ Hurricane Dora – 8/28/1964 – 9/16/1964 ✓ Hurricane King – 10/13/1950 – 10/20/1950 ✓ Unnamed Hurricane – 7/22/1926 – 8/2/1926 Although specifics regarding any injuries or property damage were not available for any of the hurricanes, PA and IA was requested and documented for the hurricanes (2004 – 2019).
Impact	The Union County community, the residents, structures, and critical facilities, can suffer from hurricane and/or tropical storm events. The impacts associated with hurricanes or tropical storms especially the destructive winds and water, which can be very destructive or catastrophic on the county residential, commercial, and public buildings, as well as the critical infrastructure such as transportation, water, energy, and communication systems. The hurricane and storm events impacting Union County, and the damages they have caused suggest that the future impacts could include: ✓ substantial flooding throughout the entire county; ✓ road closures in the unincorporated and certain incorporated areas of the county; ✓ power lines, downed trees and infrastructure damages; ✓ damage to the mobile homes and poorly constructed homes; and ✓ destruction for the agricultural and forestry industry, 34% of the total acreage in the county is farmland, and the land use is primarily agriculture and 78% of the land is woodland or forested area. With a market value of the products sold in the county in 2017 was $7,703,080, a significant hurricane/tropical storm event could destroy the agricultural season. In addition, the economic effect or financial impact could be devastating from a large-scale hurricane event not only during the crisis phase, which immediately follows the event, through the recovery and rebuilding stages.

Tornado

Tornadoes are nature's most violent storms. Spawned from powerful thunderstorms, tornadoes can cause fatalities and devastate a neighborhood in seconds. A tornado appears as a rotating, funnel-shaped cloud that extends from a thunderstorm to the ground with whirling winds that can reach 300 miles per hour. Damage paths can be in excess of one mile wide and 50 miles long.

Photo source: NOAA

Every state is at some risk from this hazard. Some tornadoes are clearly visible, while rain or nearby low-hanging clouds obscure others. Occasionally, tornadoes develop so rapidly that little, if any, advance warning is possible.

Before a tornado hits, the wind may die down and the air may become very still. A cloud of debris can mark the location of a tornado even if a funnel is not visible. Tornadoes generally occur near the trailing edge of a thunderstorm. It is not uncommon to see clear, sunlit skies behind a tornado.

The most common type of tornado, the relatively weak and short-lived type, occurs in the warm season with June being the peak month. The strongest, most deadly tornadoes occur in the cool season, from December through April.

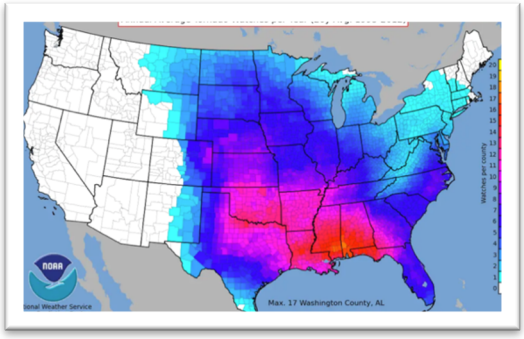


Image Source: http://www.spc.noaa.gov/wcm/20ytora.png

Some tornadoes are clearly visible, while rain or nearby low-hanging clouds obscure others. Some tornadoes develop rapidly with little advance warning and then may dissipate just as quickly. Most tornadoes are on the ground for less than 15 minutes. Before a tornado hits, the wind may die down and the air may become very still. A cloud of debris can mark the location of a tornado even if a funnel is not visible. It is not uncommon to see clear, sunlit skies behind a tornado.

Every state is at some risk from this hazard. Union County is vulnerable to these wind disasters due to a high concentration of the population residing in manufactured or mobile homes. A tornado or a series of tornadoes could affect the population if it should occur in a highly populated area. Damage has occurred from tornadoes in the county.

The possible consequences of tornadoes include: power outages, infrastructure damage (road/culvert washout), erosion, property damage/loss from wind, water and fires, fresh-water flooding, evacuations (day/night, road congestion), agricultural damage/loss, economic loss, and debris.

Facts about tornadoes:

- ✓ They may strike quickly, with little or no warning.
- ✓ They may appear nearly transparent until dust and debris are picked up or a cloud forms in the funnel.
- ✓ The average tornado moves Southwest to Northeast, but tornadoes have been known to move in any direction.
- ✓ The average forward speed of a tornado is 30 MPH, but may vary from stationary to 70 MPH.

- ✓ Tornadoes can accompany tropical storms and hurricanes as they move onto land.
- ✓ Waterspouts are tornadoes that form over water.
- ✓ Tornadoes are most frequently reported east of the Rocky Mountains during spring and summer months.
- ✓ Peak tornado season in the southern states is March through May; in the northern states, it is late spring through early summer.
- ✓ Tornadoes are most likely to occur between 3 pm - 9 pm but can occur at any time.

Source: FEMA http://www.fema.gov/hazard/tornado/index.shtm

Definition for Funnel Cloud

A condensation funnel extending from the base of a towering cumulus or Cb, associated with a rotating column of air that is not in contact with the ground (and hence different from a tornado). A condensation funnel is a tornado, not a funnel cloud, if either a) it is in contact with the ground or b) a debris cloud or dust whirl is visible beneath it.

Source: http://www.crh.noaa.gov/glossary.php?word=FUNNEL%20CLOUD

Enhanced Fujita Scale

According to NOAA's National Weather Service (NWS), Storm Prediction Center, the Enhanced Fujita (EF) Scale became operational in February 2007. It is used to assign a tornado a "rating" based on estimated wind speeds and related damage. When tornado-related damage is surveyed, it is compared to a list of Damage Indicators (DIs) and Degrees of Damage (DoD) which help estimate better the range of wind speeds the tornado likely produced. From that, a rating (from EF0 to EF5) is assigned. The EF Scale was revised from the original Fujita Scale to reflect better examinations of tornado damage surveys so as to align wind speeds more closely with associated storm damage. The new scale has to do with how most structures are designed.

The EF Scale is a set of wind estimates (not measurements) based on damage. Its uses 3-second gusts estimated at the point of damage based on a judgment of 8 levels of damage to the 28 indicators listed below. These estimates vary with height and exposure. The 3-second gusts is not the same wind as in standard surface observations. Standard measurements are taken by weather stations in open exposures, using a directly measured, and "one-minute mile" speed.

Table 4.27 - Enhanced Fujita Scale

Fujita Scale			Derived EF Scale		Operational EF Scale	
F Number	Fastest 1/4-mile (mph)	3 Second Gust (mph)	EF Number	3 Second Gust (mph)	EF Number	3 Second Gust (mph)

0	40-72	45-78	0	65-85	0	65-85
1	73-112	79-117	1	86-109	1	86-110
2	113-157	118-161	2	110-137	2	111-135
3	158-207	162-209	3	138-167	3	136-165
4	208-260	210-261	4	168-199	4	166-200
5	261-318	262-317	5	200-234	5	Over 200

NWS is the only federal agency with authority to provide 'official' tornado EF Scale ratings. The objective when measuring a tornado is to assign an EF Scale category based on the highest wind speed that occurred within the damage path. An appropriate damage indicator (DI) from more than one of the 28 used in rating the damage. The construction or description of a building should match the DI being considered, and the observed damage should match one of the 8 degrees of damage used by the scale. A determination will be made within the range of upper and lower bound wind speeds, as to whether the wind speed to cause the damage is higher or lower than the expected value for the particular degree of damage. Several structures are evaluated before a final EF rating is determined.

Table 4.28 - Enhanced F Scale Damage Indicators

Number (Details linked)	Damage Indicator (DI)	Abbreviation
1	Small barns, farm outbuildings	SBO
2	One- or two-family residences	FR12
3	Single-wide mobile home (MHSW)	MHSW
4	Double-wide mobile home	MHDW
5	Apt, condo, townhouse (3 stories or less)	ACT
6	Motel	M
7	Masonry apt. or motel	MAM
8	Small retail bldg. (fast food)	SRB
9	Small professional (doctor office, branch bank)	SPB
10	Strip mall	SM
11	Large shopping mall	LSM
12	Large, isolated ("big box") retail bldg.	LIRB
13	Automobile showroom	ASR
14	Automotive service building	ASB
15	School - 1-story elementary (interior or exterior halls)	ES
16	School - junior or senior high school	JHSH
17	Low-rise (1-4 story) bldg.	LRB
18	Mid-rise (5-20 story) bldg.	MRB
19	High-rise (over 20 stories)	HRB
20	Industrial bldg. (hospital, govt. or university)	IB
21	Metal building system	MBS
22	Service station canopy	SSC
23	Warehouse (tilt-up walls or heavy timber)	WHB
24	Transmission line tower	TLT
25	Free-standing tower	FST
26	Free standing pole (light, flag, luminary)	FSP
27	Tree – hardwood	TH
28	Tree - softwood	TS

Data source: https://www.weather.gov/oun/efscale

Historical Tornado or Funnel Cloud Occurrences

The NCDC (1/1/1950 – 9/8/2020) information reports that for the last 70 years there have been 4 funnel cloud and 6 tornado events in Union County. The storm events database documentation notes that the Tornado EF Scale was based on the Enhanced F-Scale.

Table 4.29– Tornado or Funnel Cloud Occurrences, Union County (1/1/1950 – 9/8/2020)

Location or County	Date	Time	Type	Magnitude	Death	Injuries	Property Damage	Crop Damage
Union County	4/23/1983	07:55	Tornado	F1	0	0	2.5M	0.00K
Union County	7/12/1990	16:40	Tornado	F0	0	0	0.00K	0.00K
Lake Butler	7/16/2000	11:40	Funnel Cloud	N/A	0	0	0.00K	0.00K
Providence	6/11/2001	20:10	Tornado	F0	0	0	4.5K	0.00K
Lake Butler	7/15/2004	12:00	Funnel Cloud	N/A	0	0	0.00K	0.00K
Worthington Springs	8/12/2004	13:50	Tornado	F1	0	0	0.00K	0.00K
Raiford	9/7/2004	07:00	Funnel Cloud	N/A	0	0	0.00K	0.00K
Raiford	3/25/2005	09:40	Funnel Cloud	N/A	0	0	0.00K	0.00K
Worthington Springs	8/4/2006	18:10	Tornado	F1	0	0	0.00K	0.00K
Dukes	6/7/2020	15:05	Tornado	EF0	0	0	0.00K	0.00K
Totals:							**Property Damage: $2,505,000**	

Source: http://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventType=%28C%29+Tornado

Hazard Event Narrative – Extent and Impact

1. 4/23/1983 – Union County – A F1 tornado touched down around 7:55 am in Union County. One house was demolished north of Starke in Union County. Several trailers near Raiford and on the Union – Bradford County line were destroyed or damage. Property damage totals were $2.5 million. No injuries were reported.

2. 6/11/2001 – Providence – A weak F0 tornado occurred causing large trees and power lines down. Property damage was estimated at $4,500.

3. 6/7/2020 – Dukes – A weak EF0 tornado with peak winds near 75 mph briefly touched down just north of New River and just south of SW CR 18A where is produced structure damage including roof damage to a shed, a porch, gazebo, and a pump house. Trees were blown down at a property along SW 43rd Terrace. Property damage figures were not reported.

Risk and Vulnerability Assessment

The vulnerability to tornado events can be defined as to the extent to which people will experience harm and property will be damaged from the natural hazard. Union County is vulnerable to these wind disasters due to a high concentration

of the population residing in mobile homes, approximately 46%. Also, the poorly constructed homes and the infrastructure property damage could be extensive.

Vulnerability for Union County's Structures, Facilities, and Infrastructure

Union County is vulnerable to these extreme wind disaster events due to a high concentration of the population residing in manufactured or mobile homes 1,178 as of September 2020. Tornadoes have caused damage in Union County primarily caused by wind damage and destruction to a home and trailers to downed trees and power services. Tornado warnings are issued several times a year and are evenly distributed throughout the County.

Because of their speed of onset and unpredictable paths, all buildings and facilities are considered to be uniformly exposed to this hazard and could be potentially impacted.

Vulnerability for the Union County's Population

The entire County is particularly vulnerable to tornados because of the presence of a high number of mobile homes 46% as a percentage of the housing inventory. Mobile home residents are considered highly vulnerable to hazards both for socioeconomic reasons and because of the limited protection provided by their housing structure.

The possible consequences of tornadoes include: power outages, infrastructure damage (road/culvert washout), erosion, property damage/loss from wind, water and fires, riverine flooding, evacuations (day and night, road congestion), agricultural damage/loss, economic loss, and debris. A tornado or a series of tornadoes could affect the population if it should occur in a highly populated area.

Summary details for tornado events:

Probability of Future Occurrences	The probability of tornado is low to median (at least 1 occurrence every 10 years to 1 occurrence every 3 years).
Geographic Area	The entire planning area (the City of Lake Butler, the Town(s) of Worthington Springs and Raiford, and unincorporated areas of Union County) is at low to median risk to tornado events.
Extent	The worse-case scenario for Union County would be a EF5 tornado, with destructive winds of 261 – 318 miles per hour, with complete devastation of homes leveled off foundations and swept away; trees debarked; and incredible phenomena would occur. The largest F-Scale in Union County recorded was an F1 on 4/23/1983. A F1 tornado touched down around 7:55 am in Union County. One home was demolished north of Starke in Union County. Several trailers near Raiford and on the Union – Bradford County line were destroyed or damage. Property damage was at $2,500,000.

Impact	The Union County community, the residents, the structures, and the critical facilities could suffer from tornado events. The impact of a tornado depends on its strength. Meteorologists use the enhanced Fujita or EF-scale to record the tornado activity to analyze and determine how strong the tornado is. Weak tornadoes may cause only minor damage to property, while a stronger tornado may devastate large parts of an entire town. The impacts associated with tornadoes can be very destructive or catastrophic on the County residential, commercial, and public buildings, as well as the critical infrastructure such as transportation, water, energy, and communication systems. The tornado events impacting Union County, and the damages they have caused suggest that the future impacts could include: ✓ destruction and or damage to the residential inventory (especially the mobile homes), outbuildings, automobiles, front porches, etc.; ✓ power lines, downed trees and infrastructure damages; ✓ damage to the mobile homes and poorly constructed homes; and ✓ possible destruction for the agricultural and forestry industry. In addition, the economic effect or financial impact could be devastating from a strong tornado event not only during the crisis phase, which immediately follows the event, through the recovery and rebuilding stages. Destruction could occur on the agricultural land, 34% of the total acreage in the county is farmland, and the land use is primarily agriculture and 78% of the land is woodland or forested area. With a market value of the products sold in the county in 2017 was $7,703,080, a momentous tornado event could destroy the agricultural season.

Severe Thunderstorms - *(includes Strong Winds, Lightning and Hailstorms)*

A thunderstorm is a rain shower during which you hear thunder, and since thunder comes from lightning, all thunderstorms have lightning. There are three basic ingredients needed for thunderstorm development:

- ✓ moisture,
- ✓ an unstable atmosphere, and
- ✓ some way to start the atmosphere moving.

Source: http://www.spc.noaa.gov/wcm/2013/WIND.png

The moisture is necessary to produce the thunderstorm clouds and precipitation. In the summertime, most areas of the United States (US) have sufficient moisture to generate thunderstorms if the other ingredients are present. In the wintertime, thunderstorms favor southern areas of the US where moisture is more plentiful; however, southerly winds associated with well-developed storm systems can bring sufficient moisture northward to generate thunderstorms at any time of the year, even in the dead of winter.

The atmospheric instability plays an important role in thunderstorm development as rising air is needed to produce clouds, and rapidly rising air is needed to produce thunderstorms. For air to rise rapidly, it must become buoyant compared to the surrounding air. When the atmosphere is unstable, the air near the ground can become buoyant and rise rapidly through the atmosphere. And, the warmer the air is near the earth's surface and the colder the air is aloft, the more unstable the atmosphere can be.

The third ingredient needed for thunderstorm development is something that will trigger motion in the atmosphere. This may be some sort of boundary such as a front, heating caused by the sun, or cooling aloft. Once a thunderstorm has developed, it will continue to generate boundaries that can trigger additional storms.

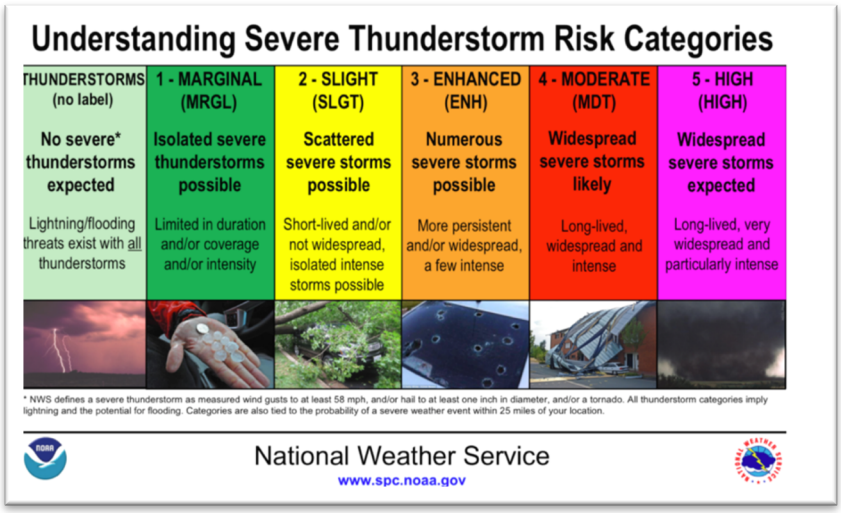
A severe thunderstorm is defined as a thunderstorm containing one or more of the following; hail ¾ inch or greater, winds gusting in excess of 57.5 mph, and/or spawns a tornado. About 10% of thunderstorms are classified as severe and some of the most severe occur when a single thunderstorm affects one location for an extended period of time.

Long-lived thunderstorms are called super cell thunderstorms. A super cell is a thunderstorm that has a persistent rotating updraft. This rotation maintains the energy release of the thunderstorm over a much longer time than typical, pulse-type thunderstorms which occur in the summer months. According to NOAA, super cell thunderstorms are responsible for producing the majority of severe weather, such as large hail and tornadoes. Downbursts are also occasionally associated with severe thunderstorms. A downburst is a strong downdraft resulting in an outward burst of damaging winds on or near the ground. Downburst winds can produce damage similar to a strong tornado. Although usually associated with thunderstorms, downbursts can even occur with showers too weak to produce thunder. Strong squall lines can also produce widespread severe weather, primarily very strong winds and/or microburst.

When a severe thunderstorm approaches, the National Weather Service will issue alerts. Two possible alerts are:

- Severe Thunderstorm Watch – Conditions are favorable for the development of severe thunderstorms.
- Severe Thunderstorm Warning – Severe weather is imminent or occurring in the area.

Figure 4.15 – Severe Thunderstorm Risk Categories



Strong Winds

High winds are very strong winds with air moving from an area of high pressure to an area of low pressure. A high wind warning is defined as 1-minute average surface winds of 35 kt (40 mph or 64 km/hr) or greater lasting for 1 hour or longer, or winds gusting to 50 kt (58 mph or 93 km/hr) or greater regardless of duration that are either expected or observed over land.

Historical Thunderstorm Occurrences

According to the NCDC, from 1/1/1950 to 9/8/2020, there have been over 70 thunderstorms, 1 high, and 1 strong wind events documented in Union County in the last 70 years with an approximate total property damage figure of $233,600.

Table 4.30– Thunderstorm, High and Strong Wind Occurrences in Union County (1/1/1950 – 9/8/2020)

Location or County	Date	Time	Type	Magnitude	Death	Injuries	Property Damage	Crop Damage
Union County	12/16/1970	15:45	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Union County	5/28/1990	12:30	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Union County	5/16/1991	19:00	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Union County	2/25/1992	16:15	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Union County	2/25/1992	16:40	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Lake Butler	1/8/1993	11:20	Thunderstorm Wind	0 kts.	0	0	5K	0.00K
Lake Butler	8/15/1995	15:50	Thunderstorm Wind	0 kts.	0	0	6K	0.00K
Lake Butler	11/11/1995	14:30	Thunderstorm Wind	0 kts.	0	0	4K	0.00K
Lake Butler	7/9/1996	16:40	Thunderstorm Wind	60 kts.	0	0	3.5K	0.00K
Lake Butler	4/28/1997	09:09	Thunderstorm Wind		0	0	8K	0.00K
Raiford	3/8/1998	21:40	Thunderstorm Wind		0	0	1.5K	0.00K
Worthington Springs	6/18/1998	17:15	Thunderstorm Wind		0	0	2.5K	0.00K
Lake Butler	6/29/1998	16:05	Thunderstorm Wind		0	0	0.30K	0.00K
Worthington Springs	7/19/1998	14:11	Thunderstorm Wind		0	0	15K	0.00K
Worthington Springs	4/28/1999	13:45	Thunderstorm Wind		0	0	2K	0.00K
Providence	6/3/1999	14:30	Thunderstorm Wind		0	0	20K	0.00K

Lake Butler	1/24/2000	08:32	Thunderstorm Wind		0	0	2.5K	0.00K
Raiford	1/24/2000	08:59	Thunderstorm Wind		0	0	1K	0.00K
Providence	3/30/2000	15:40	Thunderstorm Wind		0	0	50K	0.00K
Lake Butler	7/16/2000	11:40	Thunderstorm Wind		0	0	1K	0.00K
Worthington Springs	8/25/2000	16:32	Thunderstorm Wind		0	0	2.5K	0.00K
Lake Butler	9/6/2000	14:15	Thunderstorm Wind		0	0	2.5K	0.00K
Lake Butler	3/25/2001	13:00	Thunderstorm Wind		0	0	2K	0.00K
Providence	3/29/2001	10:15	Thunderstorm Wind		0	0	15K	0.00K
Lake Butler	4/2/2002	18:15	Thunderstorm Wind		0	0	0.10K	0.00K
Worthington Springs	7/30/2002	17:30	Thunderstorm Wind		0	0	2K	0.00K
Lake Butler	2/22/2003	14:40	Thunderstorm Wind		0	0	2K	0.00K
Countywide	4/25/2003	13:40	Thunderstorm Wind	60 kts. EG	0	0	0.00K	0.00K
Raiford	10/8/2003	20:00	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
Raiford	6/26/2004	16:30	Thunderstorm Wind	55 kts. EG	0	0	0.00K	0.00K
Worthington Springs	6/29/2004	16:45	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
Raiford	7/11/2004	15:40	Thunderstorm Wind	55 kts. EG	0	0	0.00K	0.00K
Raiford	7/11/2004	16:30	Thunderstorm Wind	55 kts. EG	0	0	0.00K	0.00K
Raiford	5/28/2006	15:58	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
Raiford	2/26/2008	15:02	Thunderstorm Wind	60 kts. EG	0	0	0.00K	0.00K
Johnstown	6/10/2008	14:30	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
Browns Still	6/17/2008	15:05	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
Duke	6/17/2008	15:15	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
Lake Butler	7/21/2008	16:10	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
Duke	7/25/2008	15:40	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
Johnstown	4/13/2009	20:45	Thunderstorm Wind	45 kts. EG	0	0	0.00K	1K
Union (Zone)	4/14/2009	06:40	Strong Wind	35 kts. EG	0	0	1K	0.00K

Lake Butler	6/20/2010	15:14	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
Ellerbee	7/5/2011	13:03	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
Guilford	8/6/2011	16:00	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
Johnstown	9/20/2011	18:15	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
Lake Butler	9/20/2011	18:15	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
Duke	7/16/2012	18:00	Thunderstorm Wind	45 kts. EG	0	0	2K	0.00K
Raiford	3/23/2013	12:40	Thunderstorm Wind	55 kts. EG	0	0	0.00K	0.00K
Guilford	7/31/2013	15:10	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
Lake Butler	8/7/2015	16:55	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
Guilford	8/17/2015	15:20	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
Providence	5/20/2016	10:25	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
Raiford	5/20/2016	11:03	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
Browns Still	6/1/2016	18:20	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
Duke	7/13/2016	18:50	Thunderstorm Wind	45 kts. EG	0	0	2K	0.00K
Worthington Springs	7/16/2016	15:00	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
Duke	7/16/2016	15:06	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
Cliftonville	7/16/2016	15:11	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
Lake Butler	7/16/2016	15:18	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
Lake Butler	2/7/2017	21:38	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
Cliftonville	2/7/2017	21:40	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
Duke	7/20/2017	19:37	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
Duke	8/9/2017	15:30	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
Lake Butler	5/5/2019	09:56	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
Providence	5/5/2019	09:57	Thunderstorm Wind	39 kts. EG	0	0	0.20K	0.00K
Cliftonville	5/5/2019	10:01	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K

Raiford	5/5/2019	10:03	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
Union (Zone)	2/6/2020	16:50	High Wind	39 kts. EG	0	0	80K	0.00K
Guilford	2/6/2020	21:30	Thunderstorm Wind	60 kts. EG	0	0	0.00K	0.00K
Duke	2/6/2020	21:35	Thunderstorm Wind	55 kts. EG	0	0	0.00K	0.00K
Ellerbee	3/31/2020	17:20	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
Totals	**Property Damage: $233,600; Crop Damage: $1,000**							

Source: http://www.ncdc.noaa.gov/stormevents/listevents

Hazard Event Narrative – Extent and Impact

1. 6/3/1999 – Providence – A roof was blown off a mobile home and large trees and power lines were down. Property damage was $20,000.

2. 3/30/2000 – Providence – Two barns and one home were damaged and two cows were dead. The magnitude of the thunderstorm was not recorded however, the property damage was estimated at $50,000.

3. 2/6/2020 – Union (Zone) – A tree was blown down onto a small home which caused major damage about 2 miles WSW of Lake Butler. There were no injuries reported, however, the property damage was estimated at $80,000.

Lightning

Lightning is an electrical discharge that results from the buildup of positive and negative charges within a thunderstorm. When the buildup becomes strong enough, lightning appears as a "bolt." This flash of light usually occurs within the clouds or between the clouds and the ground. A bolt of lightning reaches a temperature approaching 50,000 degrees Fahrenheit in a split second.

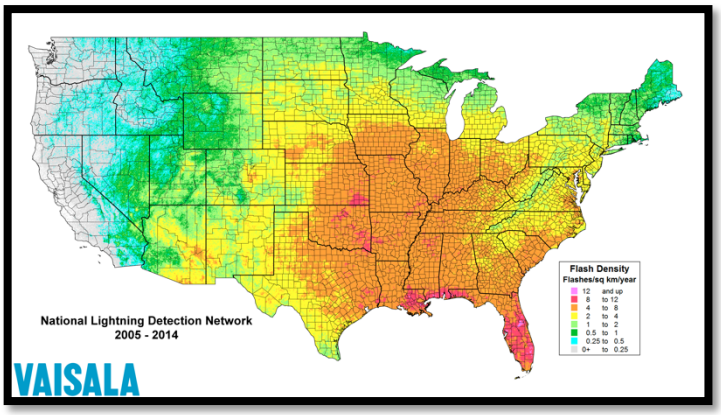
Lightning is the second most common storm-related killer in the United States. It causes several billion dollars in property damage each year and kills several dozen people. It is a frequent cause of wildfires and costs airlines billions of dollars per year in extra operating expenses.

Florida has the highest frequency of lightning in the United States. There, sea breezes from the Atlantic Ocean and Gulf of Mexico converge over solar-heated land. This lifts the moist air masses that host thunderstorms. Florida has the highest number of deaths from lightning strikes. The following are facts about lightning:

- Lightning can heat its path through the air to five times hotter than the surface of the sun.
- Lightning strikes the U.S. about 25 million times each year.
- Lightning's unpredictability increases the risk to individuals and property. Most lightning deaths and injuries occur when people are caught outdoors in the summer months during the afternoon and evening and are in open areas or near a tree.
- Lightning often strikes outside of heavy rain and may occur as far as 10 miles away from any rainfall.

- "Heat lightning" is actually lightning from a thunderstorm too far away for thunder to be heard, however, the storm may be moving in your direction.
- Your chances of being struck by lightning are estimated to be 1 in 600,000 but could be reduced even further by following safety precautions.

Figure 4.16 – Lightning Density Map



Source: http://www.vaisala.com/VaisalaImages/Lightning/avg_fd_2005-2014_CONUS_2km_grid.png

Historical Lightning Occurrences

As recorded by the NCDC (1/1/1950 – 9/8/2020), there was 1 recorded lightning events in Union County.

Table 4.31 – Lightning Occurrences in Union County (1/1/1950 – 9/8/2020)

Location or County	Date	Time	Type	Death	Injuries	Property Damage	Crop Damage
Lake Butler	5/18/2003	16:30	Lightning	0	0	0.00K	0.00K
Totals:						**Property Damage- N/A**	

Source: http://www.ncdc.noaa.gov/stormevents/listevents

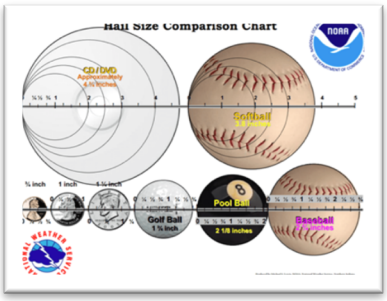
Hazard Event Narrative – Extent and Impact

1. 5/18/2003, Lake Butler – A mobile home was set on fire by a lightning strike. The property damage was not recorded.

Fires caused by Lightning

As stated in Table 4.33 from the Florida Forest Service, Fires by Causes, data reveals that over the last 20 years lightning has contributed to 75 fires burning 1,318.2 acres in Union County.

Hailstorms



Hail is precipitation in the form of lumps of ice produced by convective clouds and typically accompanies thunderstorms. They can grow by colliding with supercooled water drops, which will freeze on contact with ice crystals, frozen raindrops, dust or some other nuclei. Thunderstorms that have a strong updraft keep lifting the hailstones up to the top of the cloud where they encounter more supercooled water and continue to grow.
The hail falls when the thunderstorm's updraft can't support the weight of the ice or the updraft weakens and the stronger the updraft the larger the hailstone can grow. Hail can damage aircraft, homes and cars, and can be deadly to livestock and people.

Image Source: NOAA

Historical Hailstorm Occurrences

According to the NCDC, from 1/1/1950 to 9/8/2020, there have been 17 hailstorm events documented in Union County with approximately 41% of the hail recorded of 1-inch or over in diameter, the size of a quarter or considered severe.

Table 4.32– Hailstorm Occurrences in Union County (1/1/1950 – 9/8/2020)

Location or County	Date	Time	Type	Magnitude	Death	Injuries	Property Damage	Crop Damage
Union County	4/23/1990	15:00	Hail	0.75 in.	0	0	0.00K	0.00K
Union County	4/23/1991	07:30	Hail	1.00 in.	0	0	0.00K	0.00K
Lake Butler	6/8/1996	13:55	Hail	0.75 in.	0	0	0.00K	0.00K
Lake Butler	2/22/1998	12:00	Hail	0.75 in.	0	0	0.00K	0.00K
Raiford	8/6/1998	16:08	Hail	1.75 in.	0	0	0.00K	0.00K
Providence	3/30/2000	15:40	Hail	2.75 in.	0	0	0.00K	0.00K
Raiford	6/17/2000	19:00	Hail	0.75 in.	0	0	0.00K	0.00K
Lake Butler	7/16/2000	11:45	Hail	0.75 in.	0	0	0.00K	0.00K
Lake Butler	4/2/2002	18:15	Hail	0.75 in.	0	0	0.00K	0.00K
Lake Butler	4/25/2003	13:55	Hail	2.75 in.	0	0	0.00K	0.00K
Countywide	2/3/2006	19:48	Hail	0.75 in.	0	0	0.00K	0.00K
Lake Butler	2/3/2006	19:48	Hail	0.75 in.	0	0	0.00K	0.00K
Worthington Springs	8/4/2006	18:00	Hail	1.00 in.	0	0	0.00K	0.00K
Raiford	4/3/2008	15:20	Hail	0.75 in.	0	0	0.00K	0.00K
Worthington Springs	5/25/2009	17:18	Hail	0.75 in.	0	0	0.00K	0.00K
Duke	6/15/2011	19:25	Hail	1.75 in.	0	0	0.00K	0.00K
Duke	5/25/2014	17:10	Hail	1.00 in.	0	0	0.00K	0.00K
Totals:								**N/A**

Source: http://www.ncdc.noaa.gov/stormevents/listevents

Hazard Event Narrative – Extent and Impact

1. 3/30/2000, Providence and 4/25/2003, Lake Butler – Hail size 2.75 inch in magnitude (the size of a baseball) occurred on these two dates. There was no event narrative on the property damage.

Research and evaluation from NOAA and NCDC on hailstorm events in Union County conclude there have been no occurrences within the update period or since the previous LMS update.

Risk and Vulnerability Assessment

A severe thunderstorm contains either hail one inch or greater and winds gusts in excess of 50 knots (57.5 mph). The thunderstorm/winds have the potential of causing power outages, destruction and damage to buildings and can result in loss of life. Flash flooding from rainfall and strong straight-line winds can knock down trees, and damage mobile homes and roofs. According to the NCDC, there were 70 thunderstorm/wind events over the last 70 years (data that was recorded). The magnitude was not identified on 26% of the thunderstorm/wind events, however, the occurrences that did have the magnitude of 50 kts or more was approximately 57%, which would categorize them as severe thunderstorms.

The vulnerability from a lightning occurrence can be disastrous for the county's agricultural land, the structures and to the population. Fires can spark and ignite from lightning and data from the Florida Forest Service over the last 20 years reveal that lightning has contributed to 75 fires that have burned 1318.2 acres of land in the County.
The vulnerability from a hailstorm occurrence can be disastrous for the county's agricultural land and potentially cause damage to structures. Although there has been baseball size hail recorded in the County, no significant damage has been recorded.

Vulnerability for Union County's Structures, Facilities, and Infrastructure

The entire County is vulnerable to severe thunderstorms, lightning and hailstorm events. Due to the unpredictable nature of the storms, and severe storms are completely random, it is not possible to predict specific areas that are more susceptible to events over time. The risks and vulnerability for the City of Lake Butler and the Town(s) of Worthington Springs and Raiford are not substantially different from the risks to the unincorporated county. All buildings and facilities are considered to be uniformly exposed to this hazard and could potentially be impacted. In addition all buildings in the county are vulnerable to lightning and it is impossible to know when or where lightning will strike.

Vulnerability for the Union County's Population

The vulnerability to thunderstorm/wind, lightning and hailstorm events can be defined as to the extent to which people will experience harm and property will be damaged from the natural hazard. The entire county population are at risk and vulnerable to thunderstorm/wind, lightning and hailstorm events, especially the residents that live in mobile homes, which accounts for approximately 46% of the residential inventory, to wind and possibly hailstorm disasters.

Summary details for thunderstorm/strong winds, lightning and hailstorms events:

Probability of Future Occurrences	The probability for thunderstorms with high winds, lightning and hailstorms events is high (at least 1 occurrence every year).

Geographic Area	The entire planning area (the City of Lake Butler, the Town(s) of Worthington Springs and Raiford, and unincorporated areas of Union County) is at high risk to thunderstorm/wind, events, and median risk to potentially high risk for lightning and hailstorm occurrences. Each jurisdiction had documented thunderstorm/wind events with property damage (i.e. unincorporated Union, the City of Lake Butler, and the Town(s) of Worthington Springs and Raiford). The county had only one lightning occurrence recorded from the NCDC database; however details reveal from the Florida Forest Service that fires that have started from a lightning events in the unincorporated areas of the county, approximately 17% of the fires identified by causes.
Extent	The worse-case scenario for Union county would be the following: The National Weather Service defines a severe thunderstorm as having large hail, at least 3/4 inches (0.75 inches) in diameter, and/or damaging winds, at least 58 mph, or 50 knots. Lightning, no matter how frequently it is striking, is not a criterion for determining whether a storm is severe by national weather service definitions. Extent on County data includes: **Thunderstorms/Wind** - The magnitude extent was 60 kts, approximately 69 miles per hour, on 4 occasions (7/9/1996; 4/25/2003; 2/26/2008; and 2/6/2020). **Lightning** – According to the light density map, see Figure 4.16, the extent would be 4 to 8 flashes/sq km/year for Union County. Also, lightning has contributed to damage to the acreage in the unincorporated area of the county noting 75 fires due to lightning and 1,318 acres have burned. **Hailstorms** - The magnitude extent was 2.75 inches, a severe hailstorm, (the size of a baseball), which occurred on two occasions (3/30/2000 and 4/25/2003).
Impact	The Union County community, the residents, structures, and critical facilities, can suffer from thunderstorm/wind, or lightning and/or hailstorm events. The impacts of severe thunderstorm/wind, lightning and hailstorms can be very destructive on the county residential, commercial, and public buildings. **Thunderstorm/Wind** - The highest property damage figure was $80,000 on 2/6/2020 in Union Zone. A tree was blown down onto a small home which caused major damage about 2 miles WSW of Lake Butler. There were no injuries reported. **Lightning** - lightning can be dangerous and deadly. Over the past 20 years 75 wildfires were started from a lightning event burning 1,318.2 acres. There were no details recorded on property damage. **Hailstorms** - Although no specifics on property damage were available according to the NCDC, large hailstorm events can produce significant damage to the structures in the county.

	Destruction could occur on the agricultural land, 34% of the total acreage in the county is farmland, and the land use is primarily agriculture and 78% of the land is woodland or forested area. With a market value of the products sold in the county in 2017 was $7,703,080, a momentous or severe thunderstorm or hailstorm event could destroy the agricultural season.

Riverine Erosion

Riverine erosion is the long-term process whereby riverbanks and riverbeds are worn away. This process is best described as a river's tendency for constant course alteration, shape and depth change, and the balance between the water sediment transport capacity and the sediment supply.

The river's erosion has many consequences including land and development loss. When stormwater flows exceed channel capacity, water will overtop channel banks and spread out as floods. Union County has a few creeks, lakes, and ponds with one main river, the Santa Fe River, and the New River, a tributary of the Santa Fe River on the southern portion of the County. Riverine Erosion can possibly occur in the county as the result of floods and heavy rains. Numerous smaller rivers and streams are located within the county making the areas closer to the rivers more susceptible to riverine erosion.

According to the Suwannee River Water Management District (SRWMD) …. "Loss of soils due to riverine erosion under paved roads, bridge abutments and approaches, bridge pilings and other structural pilings, can cause structural failures that endanger public safety. Washouts of boat ramps can restrict access for emergency personnel. Riverine erosion can increase the debris flow of trees and structures like docks that can pile up against structures in the floodway, increasing stresses on the pilings and possibly contributing to failures. It is important to note that the Suwannee River doesn't move a lot and therefore there is minimal riverine erosion."

Riverine Erosion Occurrences

There is no history of significant riverine erosion events along the rivers in the unincorporated areas within the county to any structures due to the setback requirements in the Union County Comprehensive Plan.

Union County COMP

SUWANNEE RIVER SYSTEM, 100-YEAR FLOODPLAIN SPECIAL PLANNING AREA

Objective S.3 - The County shall continue to regulate land use types, densities and intensities for all lands within that part of the 100 year flood-plain of the Suwannee River System as shown on the Future Land Use map.
Policy S.3.4 - The County shall prohibit development on the river berm by requiring a minimum undisturbed, vegetated buffer of 75 feet measured from the generally recognized riverbank of the Santa Fe River be maintained for all single-family residential and agricultural uses and silvicultural activities. All other permitted land uses shall conform to the variable buffer requirements contained in Rule 40B-4.3030(4), Florida Administrative Code, as administered by the

Water Management District, in effect on January 1, 2003. Exception shall be made for the provision of reasonable access to the river; and resource-based recreational activities within buffer areas. Reasonable access shall mean the minimum amount of clearing necessary for access not to exceed 25 feet in width.

2020 Florida Forever Work Plan, SRWMD, Spring Water Quality and Quantity Restoration

According to the SRWMD, since 2012, the District has contributed over $740,000 along with state contributions of $7.2 million for projects generating water quantity and quality improvements, with a large focus on springs and river protection and restoration activities. These projects increase spring flow, **improve erosion and sediment control**, reduce nutrient (Total Nitrogen, Total Phosphorous, Suspended Solids) loading, improved recreational opportunities, support economic growth and development within our communities, and provide natural systems restoration and protection. Projects focused on springs and river restoration may include: construction of stormwater management systems, parking lot paving, **bank repair and stabilization, sediment and debris removal from spring boils/pool/run, construction of distinct access entrance points to protect bank** (i.e. steps, ramp, diving platform, canoe launch, etc.), invasive vegetation removal, and/or native aquatic plant installation. These types of restoration projects cost approximately $100,000 – $300,000 depending on scope.

Risk and Vulnerability Assessment

Vulnerability for Union County's Structures, Facilities, and Infrastructure

The vulnerability risk to riverine erosion for the County's structures and infrastructure is low (the unincorporated area of Union County is less likely than average of experiencing a threat or effect of a riverine erosion event). The erosion along the Santa Fe River does occur at a slow rate with continuing erosion and depositional processes acting within the river causing the river channel to be in a constant state of change, even during very low flow. It is very difficult to determine this rate of riverine erosion as it depends upon the location and the variation of the Santa Fe River. Tree limbs, logs, a dock, a deck, a structure, vegetation, or obstruction washes could occur into the river possibly causing a bridge or road to erode and wash out.

Vulnerability for Union County's Population

There is some vulnerability to the county's population that live near or close by the Santa Fe River to riverine erosion and might have limited access to a bridge or road that erodes or washes out, however, the percentage of the county population affected would be relatively small.

Summary details for riverine erosion events:

Probability of Future Occurrences	The probability for riverine erosion is low (at least 1 occurrence every 10 years).
Geographic Area	The unincorporated areas of Union County that are located near the Santa Fe Rivers would be the most vulnerable in terms of location.
Extent	Although the details on riverine erosion statistics (feet of riverfront lost) in the past years are not disclosed, since 2012 according to the 2020 Florida Forever Work Plan, Spring Water Quality and Quantity Restoration, the SRWMD has invested in

	improvements to minimize erosion and sediment control, bank repair and stabilization. One can determine that there was erosion occurring in previous years and the district recognized the need for springs and river protection and restoration activities. The extent for riverine erosion would be less than 1 foot per year. Also it depends on the type of hazard event that has occurred and the year. A worst-case scenario would be an elevation in the river and the velocity compounded with heavy flooding from an extreme hurricane, tropical storm, or heavy rain event that could cause tree limbs, logs, a dock, a deck, a structure, vegetation, or obstruction to wash into the river possibly causing a bridge or road to erode and wash out.
Impact	The Union County community, the residents that live near the river, and the structures and infrastructure could be impacted by a riverine erosion event if a bridge collapsed and residents were unable to use the bridge or roads for transportation. Loss of soils due to riverine erosion under paved roads, bridge abutments and approaches, bridge pilings and other structural pilings, can cause structural failures that endanger public safety. Washouts of boat ramps can restrict access for emergency personnel. Riverine erosion can increase the debris flow of trees and structures like docks that can pile up against structures in the floodway, increasing stresses on the pilings and possibly contributing to failures. The impact from riverine erosion would affect the unincorporated area of the county and residents that live close by and could potentially cause considerable damage.

Wildfires

A wildfire is any uncontrolled fire in combustible vegetation that occurs in the countryside or a wilderness area. Other names such as brush fire, bushfire, forest fire, grass fire, hill fire, peat fire, vegetation fire, veldfire and wildland fire may be used to describe the same phenomenon depending on the type of vegetation being burned.

Wildfires differ from other fires by its extensive size, the speed at which it can spread out from its original source, its potential to change direction unexpectedly, and its ability to jump gaps such as roads, rivers and firebreaks. Wildfires are characterized in terms of the cause of ignition, their physical properties such as speed of propagation, the combustible material present, and the effect of weather on the fire.

Florida's ecosystems are dependent on natural fire. These low intensity fires re-nourish soil, thin abundant vegetation, and provide proper conditions for reproduction and forage. However, since the early 1950's when Floridians actively began to suppress all fires to protect newly planted forest areas and keep newly built dwellings safe, vegetative fuel

has become dense and thick. Natural fires have given way to dangerous wildfires, which often damage rather than benefit natural surroundings.

The growing number of people relocating to Florida adds to the wildfire problem as nearly 1,000 people move to Florida each day. Additionally, Floridians who are tired of big-city life are moving to rural areas to "get back to nature". Many of them choose to live in areas where natural vegetation meets homes and communities. These areas are called the Wildland-Urban Interface, and many of these new residents are unaware of the natural role of fire in Florida and therefore are unprepared. Wildland-Urban Interface fires are fast moving fires that often require many pieces of fire-fighting equipment, and suppression is a difficult and time-consuming operation. Wildfire suppression must also take on the challenge of home protection during almost every fire that is detected. The cost of these operations grows proportionally with their complexity.

Historical Data Occurrences of All Types of Fires – Florida Forest Service (1/1/2000 – 9/15/2000)

Table 4.33 reports statistics from the Florida Forest Service, Fires by Causes, over the last 20 years reveals that 75 fires occurred burning over 1,318.2 acres In Union County.

Table 4.33 – Fires by Causes, Union County (1/1/2000 – 9/15/2000)

Cause	Fires	Percent	Acres	Percent
Campfire	6	1.32	21.1	0.51
Children	14	3.08	18.3	0.44
Debris Burn *	27	5.95	410.4	9.86
Debris Burn – Authorized Broadcast/Acreage	11	2.42	195.6	4.70
Debris Burn – Authorized – Piles	12	2.64	380.8	9.15
Debris Burn – Authorized – Yard Trash	31	683	40.2	0.97
Debris Burn – Non-Authorized Broadcast/Acreage	7	1.54	33.8	0.81
Debris Burn – Non-Authorized – Piles	19	4.19	54.5	1.31
Debris Burn – Non-Authorized – Yard Trash	30	6.61	66.2	1.59
Equipment Use *	4	0.88	15.5	0.37
Equipment – Agriculture	15	3.30	41.1	0.99
Equipment – Logging	3	0.66	1.1	0.03
Equipment – Recreation	2	0.44	0.4	0.01
Equipment – Transportation	3	0.66	0.9	0.02
Incendiary	126	27.75	1,396.7	33.57
Lightning	75	16.52	1,318.2	31.69
Misc. – Breakout	1	0.22	0.5	0.01
Misc. – Electric Fence	3	0.66	1.2	0.03
Misc. – Fireworks	1	0.22	0.1	0.00
Misc. - Power Lines	28	6.17	48.8	1.17
Misc. – Structure	2	0.44	11.0	0.26
Misc. – Other	17	3.74	48.0	1.15
Railroad	0	0	0.0	0.00
Smoking	2	0.44	1.2	0.03

Unknown	15	3.30	54.7	1.31
Total	**454**		**4,160.3**	

Source Florida Forest Service: http://tlhforucs02.doacs.state.fl.us/fmis.publicReports/FiresByCause.aspx

* Fire cause no longer used

Details from the Florida Forest Service

Information from the Fires by Causes, Union County, Suwannee Forestry Center (1/1/2015 through 12/3/2020), state that there were 92 fires, 315.7 acres burned. The top three causes were debris burn, authorized (2 fires) – 99 acres; lightning (10 fires) – 56.3 acres; and incendiary (13 fires) – 42.5 acres.

Historical Wildfire Occurrences from NCDC

According to the NCDC, 1/1/1950 – 9/8/2020 there were 5 wildfire occurrences reported in Union County with location, date, time, the type of event, if there were any deaths or injuries, and the property and crop damage estimates.

Table 4.34 – Union County Wildfires (1/1/1950 –9/8/2020)

Location or County	Date	Time	Type	Death	Injuries	Property Damage	Crop Damage
Lake Butler	7/10/1998	00:01	Wildfire	0	0	0.00K	0.00K
Lake Butler	4/29/1999	09:00	Wildfire	0	0	0.00K	0.00K
Raiford	5/6/1999	11:00	Wildfire	0	0	0.00K	0.00K
Union Zone	6/21/2011	18:10	Wildfire	0	0	0.00K	0.00K
Union Zone	9/13/2011	11:45	Wildfire	0	0	0.00K	0.00K
Total						**Property Damage: N/A**	

Source: http://www.ncdc.noaa.gov/stormevents/listevents

Hazard Event Narrative – Extent and Impact

1. Lake Butler – 7/10/1998 – Florida's wildfires began on May 25, 1998 and burnt parts of NE Florida. A large area of high pressure settled over Florida in the late spring keeping the traditional thunderstorms from forming. Lightning sparked most of the brush fires in hard to reach dry woods. Total cost across NE Florida will exceed $200 million. Event details reveal that 13,000 acres burned in the county, however, the specific data on property damage for the county was not recorded.

2. 4/29/1999, Lake Butler – Report that two fires were caused by lightning strikes. Property damage was not reported.

3. 6/21/2011, Union Zone - A lightning strike caused a fire off of Highways 125 and 121. The cost of the damage was unknown.

4. 9/13/2011, Union Zone - The Long Tram Wildfire in Union County burned over 205 acres as of September 13. The property damage was not recorded.

Research and evaluation from NOAA and NCDC on wildfire events in Union County conclude there have been no occurrences within the update period or since the previous LMS update. However, the Florida Forest Service recorded 92 wildfires burning 315.7 acres, see the information following table 4.33 for this LMS update cycle.

Additional Wildfire Occurrences (Disaster Declarations)

Information from Table 4.34, NCDC reveals that the wildfire on 7/10/1998 that IA and PA was requested by the County, Declaration # 1223, and on 4/29/1999, PA was requested, Declaration # 2258, from the wildfire as stated in Table 4.35. There was an additional declaration in June of 2000.

Table 4.35 - Disaster Declarations for Union County Due to Fires

IA, PA or both	Date – Incident Period	Disaster Event and Incident Type	Declaration #
IA, PA	May 25, - July 22, 1998	Fires	1223
PA	April 13, 1999 – Continuing	Fires	2258
PA	June 5, 2000	Fires	2306

Significant Wildfires in Florida 1981 – 2008

Details from the Florida Forest Service, *Significant Wildfires in Florida 1981 – 2008*, the wildfire from 1998, Union County was recorded as a significant wildfire called the **Swift Creek fire** with a start date of 6/15/1998 and total acreage burned in the county: **12,753 acres**.

Additional Wildfire Occurrences (not noted in the NCDC data)

Wildfire spreads in Union County By The Times-Union
Published Friday, May 19, 2000

A wildfire has erupted out of control in Union County east of Florida 121 and north of Raiford. More than 50 firefighters have battled the blaze that began around 1:30 today. It has spread quickly across more than 200 acres of rural land, and has yet to be contained as of 5:30 p.m. "It's really frightening because we were on this thing very rapidly and it's not going anywhere," Steve Ripley, forest area supervisor for Union and Bradford Counties said.

One barn has been destroyed, but seven structures including a mobile home, have been saved around the area where officials believe the blaze began. There are 10 fire engines, three helicopters dropping water, and about 20 tractors trying to contain the fire. The tractors are attempting to dig a trench around the fire that continues to head east.

Six homes in the area have been evacuated, but no one has reported any injuries. Preliminary reports say the cause of the fire is believed to be an illegal trash burning although it is still under investigation. This comes on the heels of a statewide ban on open fires mandated Wednesday.

This blaze is a couple miles east of where wildfires destroyed more than 14,000 acres during the 1998 firestorm. Representatives from the Florida Division of Forestry, the Georgia Forestry Commission, the Georgia Paper Company and volunteer firefighters from Baker County, Union County and Lake Butler are helping to fight the blaze.

Consequences of a Wildfire

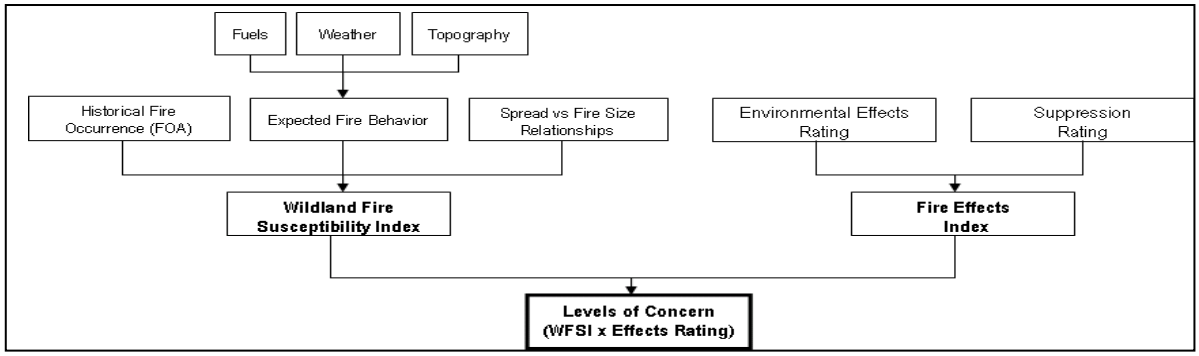
There are many types of causes that can start a wildfire, from lightning, to incendiary, to smoking in forested areas or improperly extinguishing campfires, etc. Prevention efforts include working not only educating people on forested areas, but also working with the Florida Forest Service and having the community citizens become a firewise community for preventative measures in protection from a wildfire. Consequences for a wildfire can be the following, see Table 4.36.

Table 4.36 - Consequences of Wildfires

Infrastructure	Environmental	Human	Vegetative	Economic
power outages	erosion	smoke inhalation	crop damage	business disruption
water/gas/ communication lines disrupted	wildlife destruction	personal injury	timber damage	property loss
road closures	habitat loss	human evacuation	species endangered	economic loss
roadway destruction	species endangered	animal evacuation	invasive species increased	suppression cost

The Florida Forest Service levels of concern (LOC) measures wildland fire risk (Figure 4.17). The level of concern is calculated from the probability or likelihood of an acre burning (Wildland Fire Susceptibility Index), and the expected effects of the fire (Fire Effects Index). The Fire Response Accessibility (FRA) Index is a measure of the initial attack response time to a cell from existing initial dispatch locations for fire protection resources. Taken as a pair, these two indices (LOC and FRA) define a cell's accessibility and its vulnerability to wildland fire occurrence and effects. As a result, non-burnable areas and 9 LOC categories ranging from low concern to high concern were assigned. The LOC results can be used to identify areas where mitigation options may be of value.

Figure 4.17 - Wildfire Level of Concern Variables



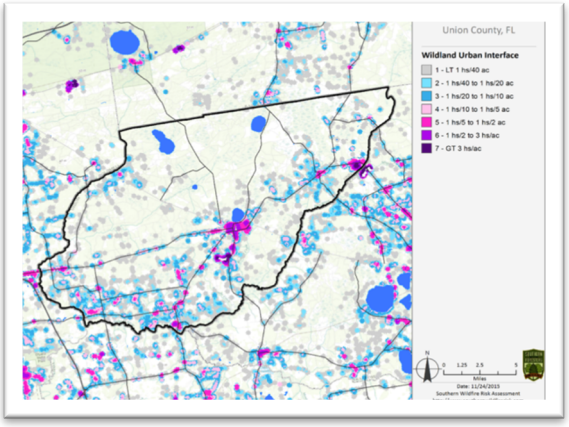
Source: Florida Forest Service, Managing Wildland Fire Risk in Florida; https://www.fs.fed.us/pnw/pubs/gtr802/Vol2/pnw_gtr802vol2_brenner.pdf

Risk and Vulnerability Assessment

The wildfires that burned in Florida in the last several years are examples of the increasing wildfire threat which results from the Wildland Urban Interface (WUI). The Wildland Urban interface is defined as the area where structures and

other human development meet with undeveloped wildland or vegetative fuels (FEMA). As residential areas expand into relatively untouched wildlands, people living in these communities are increasingly threatened by forest fires. Figure 4.18 map identifies the WUI for Union County.

Figure 4.18 – Union County Wildland Urban Interface (WUI)



Source: Union County CWPP

Figure 4.19 – Key Code for Union WUI and Population

Housing Density	WUI Population	Percent of WUI Population	WUI Acres	Percent of WUI Acres
LT 1hs/40ac	830	5.1%	29,165	53.5%
1hs/40ac to 1hs/20ac	1,101	6.8%	9,497	17.4%
1hs/20ac to 1hs/10ac	1,772	10.9%	7,538	13.8%
1hs/10ac to 1hs/5ac	2,427	15.0%	4,850	8.9%
1hs/5ac to 1hs/2ac	2,332	14.4%	2,221	4.1%
1hs/2ac to 3hs/1ac	3,065	18.9%	1,071	2.0%
GT 3hs/1ac	4,704	29.0%	218	0.4%
Total	**16,231**	**100.0%**	**54,560**	**100.0%**

Details from the CWPP: The following SouthWRAP table shows the WUI population and acres for each housing-density category within the county. The housing-density categories 4-7 combined, account for 12,528 people, or 77% of the county WUI population living in wildfire hazard areas classified as WUI Community Protection Zones (CPZs). CPZs then, represent those areas considered the highest priority for community assessments, wildfire hazard mitigation and risk reduction, and protection activities.

Source: Union County CWPP

Vulnerability for Union County's Structures and Facilities

Union County's buildings, infrastructure and critical facilities are considered very vulnerable to damage caused by wildfires.

2019 Community Wildfire Protection Plan (CWWP) Update

The Florida Forest Service maintains data in the Southern Wildfire Risk Assessment Portal which indicates each WUI Community Protection Zones (CPZ) wildland and structural vulnerabilities to threats of both direct fire and ember exposure. The primary CPZs represent those areas considered the highest priority for mitigation planning, wildfire prevention, risk reduction, and protection activities. The dominant CPZs within Union County are the following: Browns

Still (incorporates brown); Danville; Dukes; Ellerbee; Lake Butler; Providence; Raiford; and Worthington Springs. The vulnerability location maps are noted in the Union County CWPP, Appendix C.

Structures in the wildland urban interface zone are vulnerable to ignition by three different ways: radiation, convection, and firebrands (National Wildland Urban Interface Fire Protection Program). Radiating heat from a wildfire can cause ignition by exposure to the structure. The chances of ignition increase as the size of the flames increases, surface area exposed to flames increases, length of exposure time increases, and distance between the structure and the flames decreases.

The Wildland Urban Interface (WUI) Risk Index layer is a rating of the potential impact of a wildfire on people and their homes. The key input, WUI, reflects housing density (houses per acre) consistent with Federal Register National standards. The location of people living in the Wildland Urban Interface and rural areas is key information for defining potential wildfire impacts to people and homes.

Understanding WUI CPZs and the potential impact and consequences of wildland fire on people and their structures is the foundation for quantifying risks and prioritizing wildfire hazard mitigation and risk reduction actions.

Vulnerability for the Union County's Population

The population most vulnerable to wildfires would be the residents living in close proximity to Union County's heavily wooded rural areas. Approximately 77% of the county WUI population living in wildfire hazard areas classified as WUI Community Protection Zones (CPZs). The Union County, Wildfire Levels of Concern (LOC), Table 4.36 and Figure 4.18, Union County WUI, determines wildfire impact levels in the incorporated and unincorporated areas of the County. The population at risk and vulnerable to wildfires is noted in Table 4.37.

Table 4.37– Wildfire Population by Level of Concern Category

County	LOC 1	LOC 2	LOC 3	LOC 4	LOC 5	LOC 6	LOC 7	LOC 8	LOC 9
Union	195	216	1,762	618	561	738	843	176	99

Source: Florida Division of Emergency Management, GIS Department,
Data for the State of Florida Enhanced Hazard Mitigation Program, 2018

Specifics from Table 4.37, the highest vulnerability for the population would be the level of concern: 3 with 1,762 residents at risk within the population. The topmost risk areas for the population are in the unincorporated areas of the county due to the concentration of residents in rural wooded areas, additional threats to life and property exist, therefore, requiring increased mitigation efforts. This segment of the population could include the mobile home residents which accounts for 46% of the residential structures, the poor, the sick, the elderly, the children, and a segment of the single-family home population living in the unincorporated area of the county.

Summary details for wildfire events:

Probability of Future Occurrences	The probability for wildfire events is high (at least 1 occurrence every year) particularly during drought cycles and very dry conditions. Florida's dry season usually begins in November and continues through May or June, with the driest months being March through May or June. The drought monitor should be watched for the county especially during the Springtime on a daily basis.

Geographic Area	The CPZ areas: Browns Still (incorporates brown); Danville; Dukes; Ellerbee; Lake Butler; Providence; Raiford; and Worthington Springs and the heavily forested areas of unincorporated Union County are most vulnerable to wildfire events, especially during drought cycle events.
Extent	Based on the quantitative measurements for wildfires, the worse-case scenario from the recorded data: Lake Butler – 7/10/1998 – Florida's wildfires began on May 25, 1998 and burnt parts of NE Florida. A large area of high pressure settled over Florida in the late spring keeping the traditional thunderstorms from forming. Lightning sparked most of the brush fires in hard to reach dry woods. Total cost across NE Florida will exceed $200 million. Event details reveal that 13,000 acres burned in the county, however, the specific data on property damage for the county was not recorded. Note: Details from the Florida Forest Service, *Significant Wildfires in Florida 1981 – 2008*, the wildfire from 1998, Union County was recorded as a significant wildfire called the **Swift Creek fire** with a start date of 6/15/1998 and total acreage burned in the county: **12,753 acres**.
Impact	The Union County community, the residents, the structures, and the infrastructure could suffer from a wildfire event. The future impact of wildfire occurrences can be evaluated as to what the county could expect in in the future. The Bugaboo Fire that occurred in 2007 was not only the most significant wildfire in the State's history, the impact affected the entire NE Florida community with poor air quality, residential evacuations, and structural damage. As stated earlier, Union County is very vulnerable to wildfires due to the extent of 78% of the acres in the county is forestland or woodland. The Swift Creek Fire in 1998 was the largest wildfire in Union County's history (1981- 2008) resulting in 12,753 acres burned which accounts for 8% of the total acres in the county. Union County can anticipate significant wildfire events in the future and all mitigation efforts in prevention are essential in planning for the county residents and surrounding communities. Another significant wildfire like the Swift Creek Fire or an even larger wildfire event could have serious impact on the county's economy.

Prevention

The Florida Forest Service encourages all Florida residents to become involved in their program areas of prevention addressing the wildfire issues in the state.

Figure 4.20 – Article on Smokey Bear in Lake Butler, Union County Times, 8/14/2014

(L-r) Ryan Mauga, Alecxis Lukatz, Smokey Bear and Rilie Lukatz in front of the splash park.

Smokey Bear turns 70

Smokey Bear celebrated his 70th birthday at Lakeside Park in Lake Butler on Thursday, August 7.

Smokey Bear is America's wildfire prevention icon. He has educated generations of Americans about their role in preventing human-caused wildfires. Created in 1944, the Smokey Bear Wildfire Prevention campaign is the longest running public service advertising campaign in U.S. history.

As one of the world's most recognizable fictional characters, Smokey's image is protected by U.S. federal law and is administered by the U.S. Department of Agriculture Forest Service, the National Association of State Foresters and the Ad Council.

The campaign's original catch phrase was "Smokey Says – Care Will Prevent 9 out of 10 Forest Fires." In 1947 it was changed to "Remember... Only YOU Can Prevent Forest Fires." Most recently, in 2001, it was again modified to "Only You Can Prevent Wildfires" in response to a massive outbreak of wildfires in natural areas other than forests. The term "wildfire" applies to any unwanted, unplanned, uncontrolled outdoor fire.

Despite the campaign's success over the years, wildfire prevention remains one of the most critical issues affecting our country and Smokey's message is as relevant today as it was in 1944.

Learn more about Smokey Bear at **smokeybear.com**.

- The Fire Prevention Program – Smokey Bear remains an active part of our overall prevention message, but our work goes beyond Smokey.
- ✓ Smokey Bear actively visits the schools in Union County to promote wildfire safety and the benefits of fire prevention.
- The Firewise Communities Program educates homeowners and community professionals about creating defensible space around their homes, helping to protect them from the dangers of wildfire.
  The program is based upon two principles:
  1. Homeowners must take responsibility for home fire safety and become "partners" with the fire protection agencies, and
  2. Homes (neighborhood and communities) can be designed, built and maintained to withstand a wildland fire without the intervention of a fire department.
  3. The Union County Assistant EM Director/Fire Captain and the EM Director/Fire Director work with the Florida Forest Service in providing an outreach program for the county citizens on Firewise; defensible space, hazardous fuel reduction and fire adaption.
- Union County also addresses issues relating to firewise communities in the Community Wildfire Protection Plan (CWPP).
- Prescribed Fire is a cost-effective tool to reduce fuel buildups, which can cause dangerous wildfire conditions. The use of prescribed fire provides increased protection to people, their homes and the forest.

Community Wildfire Protection Plan (CWPP)

As stated by the Forests and Rangelands… "The Healthy Forests Restoration Act (HFRA) provided communities with a tremendous opportunity to influence where and how federal agencies implement fuel reduction projects on federal lands. A Community Wildfire Protection Plan (CWPP) is the most effective way to take advantage of this opportunity. Additionally, communities with Community Wildfire Protection Plans in place will be given priority for funding of hazardous fuels reduction projects carried out under the auspices of the HFRA."

In December 2016, Union County established their CWPP; the plan was reviewed and updated in 2019. Located in Appendix C, the plan provides the planning process, vulnerability assessment, the current wildfire protection activities, the CWPP goals and objectives, the action plan, and the implementation and maintenance for the plan.

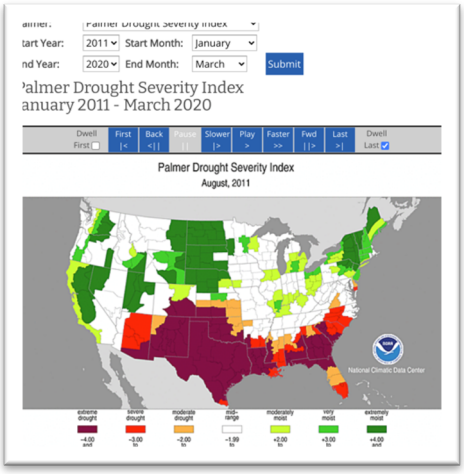
The CWPP can consolidate knowledge and serve as a single resource for wildland fire risk and hazard mitigation information. Included are an assessment of Union County's wildfire vulnerability, local organizations and resources available to assist with wildfire mitigation and response, and a pre-fire action plan for reducing wildfire vulnerability throughout the county. The plan also addresses the challenges of fire protection in the Wildland Urban Interface (WUI) through locally supported proactive solutions and activities, which facilitate the creation of Fire Adapted Communities (FAC).

As populations' increase and development continues to push into the rural wildland areas, it will be necessary to take active steps to reduce the wildfire risk to Union County residents. Through the approved CWPP, development

regulations, vegetative fuel reduction, and on-going public education programs in high-risk areas, the potential for loss of human life and property from wildfire can be greatly reduced.

Drought and Heat Wave (Extreme Heat)

Drought



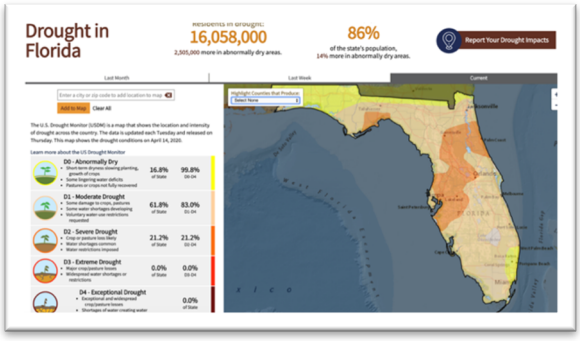
Drought can be defined based on rainfall amount over some period of time, vegetation conditions, agricultural productivity, soil moisture, levels in reservoirs and stream flow, or economic impacts. In basic terms, a drought is a significant deficit in moisture availability due to lower than normal rainfall. This deficiency results in a water shortage for some activity, group or environmental sector. Excessively dry and hot conditions can provoke dust storms and low visibility. Droughts occur when a long period passes without substantial rainfall. A heat wave combined with a drought is a very dangerous situation.

The drought data noted in Table 4.38 was derived from the Palmer Drought Severity Index from NOAA, Climate Monitoring. The Palmer Drought Severity Index (PDSI) is an indicator of the relative dryness or wetness effecting water sensitive economies. The PDSI indicates the prolonged and abnormal moisture deficiency or excess. This indicator is of general conditions and not local variations caused by isolated rain. Calculation of the PDSI is made for 350 climatic divisions in the United States and Puerto Rico. The data collected for the calculations include the weekly precipitation total and average temperature, division constants (water capacity of the soil, etc.) and previous history of the indices.

The PDSI is an important climatological tool for evaluating the scope, severity, and frequency of prolonged periods of abnormally dry or wet weather. It can be used to help delineate disaster areas and indicate the availability of irrigation water supplies, reservoir levels, range conditions, amount of stock water, and potential intensity of forest fires.

Historical Drought Occurrences

According to the Florida Climate Center, *Historic Drought in Florida…* " Because drought is defined on so many different levels, has differing impacts, and can happen on short or long time scales, it is hard to compare one drought to another. An examination of weather records since 1900 reveals that in every decade there has been at least one severe and widespread drought somewhere within Florida. Droughts that began in 1906, 1927, 1945, 1950, 1955, 1961, 1968, 1980, 1984, 1998, and 2006 were the most severe."



Palmer Drought Severity Index (PDSI) Drought Occurrences

The PDSI data for Union County on years (January 2011 – August 2020) are as follows:

Table 4.38 - Palmer Drought Severity Index Drought Occurrences
January 2011 – August 2020

Years	Data on Drought
2011	There was a recorded period of time in the months of January, February, March, and April that had moderate periods of drought; and May, June, July, and November with severe periods of drought; and August, September, October, and December that had periods of extreme drought.
2012	There was a recorded period of time in the months of January, February, March, and April that had periods of extreme drought.
2013; 2014; 2015	There was no drought data recorded in the following years 2013, 2014 and 2015.
2016	There was a recorded period of time in the months of July, August, September, November and December that had periods of moderate drought.
2017	There was a recorded period of time in the month of January with moderate drought, and in the months of February, March, April and May that periods of severe drought.
2018	There was no drought data recorded in 2018.
2019	There was a recorded period of time in the months of September, October, and November that had periods of moderate drought.
January – August 2020	There was a recorded period of time in the months of January, February and May that have had moderate drought, and in the month of March there was severe drought.

Source: https://www.ncdc.noaa.gov/temp-and-precip/drought/historical-palmers/psi/201101-202008

Additional Drought Occurrence

According to the NCDC there was one drought occurrence reported in Union County.

Table 4.39 – Drought Occurrences in Union County (1/1/1950 – 9/8/2020)

Location or County	Date	Time	Type	Death	Injury	Property Damage	Crop Damage
Union (Zone)	12/18/2006	00:00	Drought	0	0	0.00K	0.00K
Total	**Property/Crop Damage: N/A**						

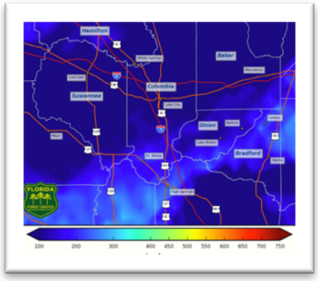
Source: http://www.ncdc.noaa.gov/stormevents/listevents

Hazard Event Narrative – Extent and Impact

1. 12/18/2006, Union Zone – There was severe drought and threat of fire to the lives and property for the residents in Union County. The official drought index and known dry and windy conditions which continue to cause, exacerbate and increase the threat of wildfires within the county resulting in further measures are required to protect the county citizens and visitors and to otherwise protect their health, safety, welfare and property. Therefore a burn ban was put into place for 14 days and a state of local emergency existed due to the severe threat of fire.

Keetch Byram Drought Index (KBDI)

Figure 4.21 – KDBI, Florida Forest Service



In addition to the drought monitor and PDSI, the county utilizes KBDI, which is updated each day by the Florida Forest Service see Figure 4.21. KBDI is a good indicator of the drought/moisture conditions for agricultural purposes, and it also provides a planning tool for the risks of wildfire. This index provides a numerical scale of 1 through 800, with 800 being the driest and 1 being wettest.

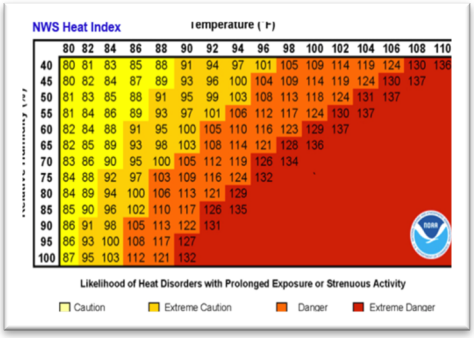
Source: http://fireweather.fdacs.gov/wx/kbdi_index.html

Agriculture is the most vulnerable asset of the County to drought. The direct physical effects of drought in Union County typically include poor crops (i.e. wheat for grain, soybeans,, and crops including nursery and greenhouse), increased fire danger, less water in the soil, streams and reservoirs, and less water available for livestock and wildlife. These lead to indirect effects such as reduced farm income and reduced revenues for vendors and retailers who serve agricultural producers and could present an impact to County.

Heat Wave/Extreme Heat

Temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks are defined as extreme heat, or those prolonged excessive heat/humidity episodes. Humid or muggy conditions, which add to the discomfort of high temperatures, occur when a "dome" of high atmospheric pressure traps hazy, damp air nears the ground.

Figure 4.22 - Heat Index Chart



According to the NWS, the “Heat Index” (HI), is sometimes referred to as the “apparent temperature”. The HI, given in degrees F, is an accurate measure of how hot it really feels when relative humidity (RH) is added to the actual air temperature.

To find the HI, look at the Heat Index Chart, Figure 4.22. As an example, if the air temperature is 96°F (found on the left side of the table) and the RH is 60% (found at the top of the table), the HI- or how hot it really feels-is 116°F.

HI values were devised for shady, light wind conditions, exposure to full sunshine can increase HI values by up to 15°F. Also, strong winds, particularly with very hot, dry air, can be

extremely hazardous. Note on the HI chart the shaded zone above 105°F. This corresponds to a level of HI that may cause increasingly severe heat disorders with continued exposure and/or physical activity.

Union County's hot season are the months of June to early September with an average high temperature of 90°F in the month of July. Data from The Southeast Regional Climate Center noted that a town approximately 15 miles from the City of Lake Butler, the record high temperature was 92.1°F. The evaluation would be that Lake Butler possibly experienced a similar record temperature.

Heat wave events occurring in the hot season would be in the 100°F plus temperature range. Although the relative humidity data was not available, the county is located in a humid subtropical climate zone and at the time, the humidity was probably high. To determine what the Heat Index might have been for this record temperature of 102°F, if the RH was 60%, the HI would have been 137°F based on the Heat Index Chart.

The heat can kill by taxing the human body beyond its abilities. In a normal year, about 175 Americans die to the demands of summer heat. In the 40-year period from 1936 through 1975, nearly 20,000 people were killed in the United States by the effects of heat and solar radiation. In the disastrous heat wave of 1980, more than 1,250 people died. Elderly persons, small children, chronic invalids, and those on certain medications or drugs, are particularly susceptible to heat reactions, especially during heat waves in areas where a moderate climate usually prevails.

Small children are incredibly susceptible to heat, especially in a vehicle as it only takes approximately 10 minutes to heat up 19 degrees, so that it can reach lethal temperatures quickly. A child is more susceptible than adults to heat as their bodies heat up 3 to 5 times quicker and can suffer a heat stroke.

Heat Related Occurrence

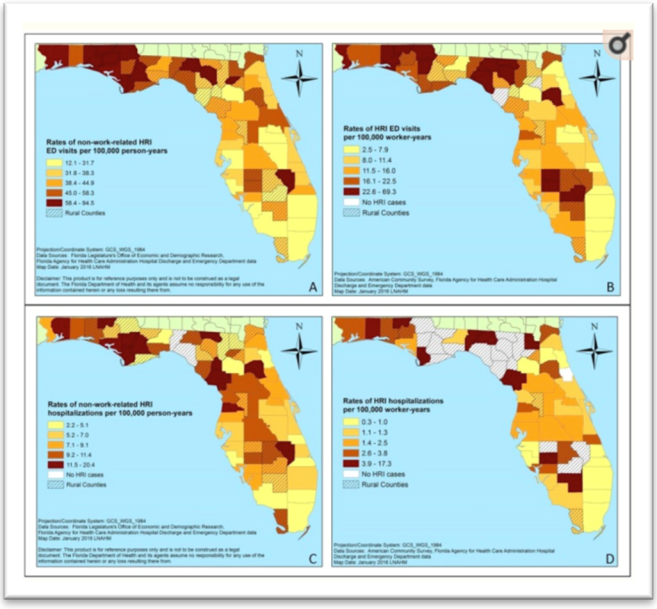
As reported by the International Journal of Environmental Research and Public Health, A Comprehensive Evaluation of the Burden of ***Heat-Related Illness and Death*** within the Florida Population, June 2016, among Florida residents, during the Florida warm season (May–October) for 2005–2012, there were 23,981 non-work-related HRI cases treated in the ED, 4816 HRI hospitalizations, and 139 HRI deaths. These cases accounted for 0.10% of all-cause warm season non-work- related ED visits, 0.05% of non-work-related hospitalizations, and 0.02% of non-work-related deaths. Among work-related HRI cases, there were 2979 cases treated in the ED, 415 hospitalizations, and 23 deaths. The work-related HRI cases accounted for 0.66%, 0.98%, and 2.3% of all-cause work-related ED visits, hospitalizations, and deaths during the warm season.

Figure 4.29 demonstrates that Union County details are as follows:

- Box A -Rates of non-work related HRI ED visits per 100,000 person-years (58.4 – 94.5 for Union); the highest category
- Box B - Rates of HRI ED visits per 100,000 worker-years (there were no HRI cases); N/A for Union
- Box C – Rates of non-work related HRI hospitalization per 100,000 person-years (9.2 – 11.4 for Union); the 2nd highest category
- Box D – Rates of HRI hospitalizations per 100,000 worker-years (there were no HRI cases); N/A for Union

Figure 4.23 – Statistics on Heat-Related Incident Rates for the Florida Counties

(Box A to the left – top; Box B to the right – top)



(Box C to the left- bottom; Box D to the right- bottom)

Source: International Journal of Environmental Research and Public Health; https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4924008/

According to the Florida Department of Health in Union County, data related to ED incidents for HRI is not recorded for the county.

Risk and Vulnerability Assessment

Drought and heat wave events typically impact an area that cannot be confined to any geographic boundaries. The vulnerability and risk to drought and heat wave events can be defined as to the extent to which people will experience harm and potentially property could be damaged from the natural hazard.

During the onset of a drought, which can occur about once in every three years in a given area can result in elevated fire risk and decreased crop growth which could pose a significant threat to the agriculture industry and would be considered a critical risk to the economic vitality of the state's vital agriculture industry.

Vulnerability for Union County's Structures and Facilities

Union County's buildings, infrastructure and critical facilities are not considered vulnerable to damage caused by drought and heat wave events and therefore estimated property loss would be minimal in the area. It is important to mention that a long-term drought event could present some vulnerability to the water wells, which could present water shortages throughout the county.

Vulnerability for the Union County's Population

Union County had a negative growth rate of -0.2% from 2010 to 2019 with population total in 2019 of 15,505. The % projected assessment for the population growth from 2019 to 2020 is -0.1%, or an estimated population total of 15,488. The entire estimated population could be affected by a drought or a heat wave event, especially water shortages, which could present a serious problem.

Heat Wave Event

A heat wave event does present a safety threat for the County's population, especially the vulnerable population, the elderly persons, small children, chronic invalids, the sick and those on certain medications or drugs, are particularly susceptible to heat reactions.

The vulnerability to heat depends on climatic factors such as the frequency of heat waves and on individual risk factors, which could include; medical, age, gender, pre-existing disease, use of certain medications, level of hydration, living alone, housing condition, the presence and use of air-conditioning in the home or residential institution. It also can be said that the vulnerability to heat wave could result as a function of sensitivity to exposure, the characteristics of the population, the exposure to heat wave duration and, the measures and actions in place to reduce the loss of life.

Table 4.40 – Estimated % of the Population that could be Affected by a Heat Wave Event

Estimated % of the Union County Population that could be affected by a Heat Wave Occurrence	
% of 65 years of age over	14.5% or approximately 2,211 elderly residents (based on data from Table 3.3)
% of children 5 years or younger	5.5%, or approximately 849 children (based on data from Table 3.3)
% in poverty, all ages	20.6% or approximately 3,139 residents (based on data from Table 3.5)

Summary details for drought/heat wave events:

Probability of Future Occurrences	The probability for drought or heat wave events is moderate (at least 1 occurrence every 3 years) to potentially high.
Geographic Area	The entire planning area (the City of Lake Butler, the Town(s) of Worthington Springs and Raiford, and the unincorporated areas of Union County) is likely to be uniformly exposed to a drought or heat wave event.
Extent	**Drought** Based on the quantitative measurement for droughts, the extent and worse-case scenario for a drought event would be the drought from 1998 – 2002.

	As stated by the USGS… " Lower than normal precipitation caused a severe statewide drought in Florida from 1998 to 2002. Based on precipitation and stream flow records dating to the early 1900s, the drought was one of the worst ever to affect the State. In terms of severity, this drought was comparable to the drought of 1949-1957 in duration and had record-setting low flows in several basins. The drought was particularly severe over the 5-year period in the northwest, which included Union County where rainfall deficits ranged from 38-40 inches below normal. Within these regions, the drought caused record-low stream flows in several river basins, increased freshwater withdrawals, and created hazardous conditions ripe for wildfires, sinkhole development, and even the draining of lakes." 12/18/2006, Union Zone – There was severe drought and threat of fire to the lives and property for the residents in Union County. The official drought index and known dry and windy conditions which continue to cause, exacerbate and increase the threat of wildfires within the county resulting in further measures are required to protect the county citizens and visitors and to otherwise protect their health, safety, welfare and property. Therefore a burn ban was put into place for 14 days and a state of local emergency existed due to the severe threat of fire. In addition, according to PDSI, in 2011 and 2012 there were periods of extreme drought in Union County with a KDBI index of 700 - 800. **Heat Wave** Based on the heat wave data for Union County from The Southeast Regional Climate Center noted that a town approximately 15 miles from the City of Lake Butler, the record high temperature was 92.1°F. The evaluation would be that Lake Butler possibly experienced a similar record temperature. To determine what the heat index might have been for this record temperature of 92.1°F, if the relative humidity was 70%, the heat index would have been 112°F.

Impact	**Drought** Droughts can have an impact on the water levels and can last for months or even years. As noted above, although there are many periods of high groundwater levels in the past sixty years, the data shows a continued trend of lower groundwater levels, which could present a significant impact for the entire community. Drought is a prolonged period when there is a precipitation deficit from normal values. The duration of below normal precipitation amounts and their impacts can affect the County's water supplies, agriculture, and the fire danger levels and is measured on the basis of the severity of these impacts. The Union County agricultural community and the residents would be impacted from a lengthy and damaging drought event. With over 308 farms in the county and a market value of the agricultural products (crops and livestock) sold of: $7,703,000 (data recorded from the 2017 Census of Agriculture), the effect could be considerable loss in revenue for the county. **Heat Wave** The Union County community and residents would be impacted from a heat wave event with a combination of high temperatures with a high heat index. Elderly persons, small children, special needs, and those on certain medications or drugs, are particularly susceptible to heat reactions, especially during heat waves in areas where a moderate climate usually prevails. Small children are incredibly susceptible to heat, especially in a vehicle as it only takes approximately 10 minutes to heat up 19 degrees, so that it can reach lethal temperatures quickly. A child is more susceptible than adults to heat as their bodies heat up 3 to 5 times quicker and can suffer a heat stroke.

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Winter Storms/Freezing Temperatures

Winter storms may include extreme cold temperatures (freeze), high winds, snow, and ice, all of which have the potential to impact people, structures, and infrastructure. During the winter, the North Florida region is occasionally invaded by massive cold fronts that originate far to the north and the results are carried to the Southern states. Although the temperature within these air masses rises significantly during their passage to Florida, they are capable of bringing intense cold to the State.

Florida has experienced occasional cold fronts that can bring high winds and relatively cooler temperatures for the entire state, with high temperatures that could remain into the 40s and 50s (4 to 15 °C) and lows of 20s and 30s (-7 to 4 °C) *for few days* in the northern and central parts of Florida, although below-freezing temperatures are very rare in the southern part of the state.

Freezing Temperature Record

The State's record minimum temperature was set in February 1899 when Tallahassee experienced -2° F. Once cold waves move onto the peninsula the relatively warm waters of the Atlantic and the Gulf of Mexico exert their influence, and the airmass' temperature rises. The record low temperature recorded for Union County **6.08 °F** on February 13, 1899.

Not a year goes by when there is not some damage to the citrus or vegetable crop somewhere in the State. Severe freezes in the 19th and 20th centuries gradually drove the center of citrus production southward from the Orlando area to southern Polk County. Winter vegetable growers have long concentrated their production south of Lake Okeechobee, where they gamble each year that their crop will be spared a severe blow from freezes.

Of the dozen or so devastating freezes that have impacted the citrus industry and other agriculture concerns over the last century or in the Southeast, nearly all of them occurred during times of Neutral conditions in the Pacific Ocean, when there is neither El Niño or La Niña present. An in-depth analysis of weather observations from across the Southeast over the last 60 years shows that the risk of severe freezes in Florida is up to three times greater during Neutral conditions in the Pacific Ocean.

Historical Winter Weather Occurrences

According to the NCDC in table 4.41, there was one winter weather occurrence reported in Union County over the last 69 years, however, additional data on winter events are noted from other resources.

Table 4.41 – Winter Weather Occurrences in Union County – (1/1/1950 – 9/8/2020)

Location or County	Date	Time	Type	Death	Injuries	Property Damage	Crop Damage
Union (Zone)	1/3/2018	07:13	Winter Storm	0	0	0.0K	0.00K
Totals:							**N/A**

Source: http://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventType=%28Z%29+Winter+Storm

Hazard Event Narrative – Extent and Impact

1. 1/3/2018, Union Zone – At 7:13 am, the public reported freezing rain about 3 miles WSW of Lake Butler with sleet reported along the Highway 231. At approximately 11:50 am, the public reported light snow about 1 mile SW of Lake Butler. Property damage details were not available.

Additional Winter Weather/Freezing Temperature Occurrences

(Recorded data from the following sources: NOAA News; NOAA Southern Region Headquarters; NWS; NCDC, and northfloridanow.com (not direct specific details for Union, however, for the entire State for the Storm of the Century).

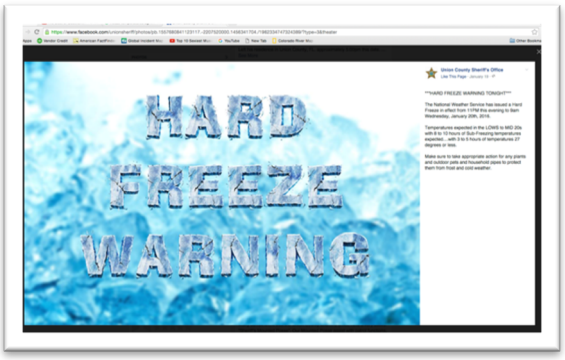
- ✓ 3/13/1993 – The No Name Storm (data from NCDC) - The "Storm of the Century" roared across Florida producing a variety of severe and unusual weather conditions for a period of about 18 hours from late Friday, 3/12 to late Saturday, 3/13. A severe squall line raced eastward at 50 mph ahead of an intense low producing several tornadoes and strong downbursts as it moved through the state and directly causing fatalities. From intense storm surge and flooding on the gulf coast to a period of 8 to 12 hours of high sustained winds of up

to 50 mph with gusts to 70 mph to cold air which poured in behind the intense low with up to four inches of snow falling in the panhandle to a trace to 3 inches elsewhere across north Florida. Record or near record low temperatures occurred over much of the state the following two nights. Total property damage for the State was estimated at $1.6 billion and 47 fatalities, (specific property damage for Union County statistics and fatality data was not available).

- ✓ 2/9/1999 — One hundred years ago this week an arctic blast froze two-thirds of the nation, setting records that stand today. A blizzard paralyzed the Eastern Seaboard and for only the second time in recorded history, the Mississippi River brought ice to the Gulf of Mexico. In Florida, the centennial cold snap brought snow flurries as far south as Fort Myers, with Lake City receiving three inches. Cold swept across the state behind the storm and Tallahassee still holds the state record of 2 below zero on Feb. 13. Freezing temperatures occurred all the way to Miami, which posted a low of 29 degrees on Valentine's Day.

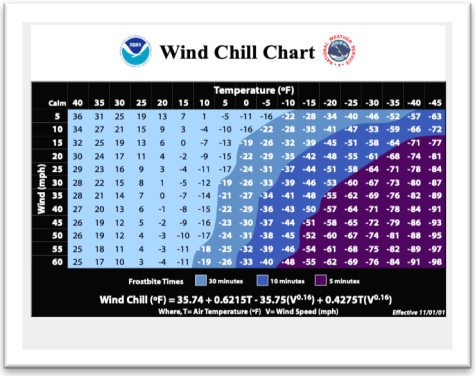
- ✓ 12/1/2000 – 1/25/2001 – Union County experienced freezing temperatures per FEMA Declaration #1359. Specifics if the County received IA or PA was not available.

According to the Florida Climate Center…. "When an intense low pressure system is followed by a strong high pressure system, particularly powerful invasions of cold air may occur in Florida. These cold air outbreaks can produce below-freezing temperatures and are usually accompanied by strong winds that can produce bitterly cold wind chills."



As reported by the Union County Emergency Management Department, there have been freezing and cold temperatures that have occurred in the county since March 1993, profiled in the winter storm above, however, throughout the years (1993 – 2016), the duration for freezing temperatures and winter storm events were minimal, only lasting hours to a couple of days. Note: *The latest freeze occurred on January 20, 2016 with temperature 27°F or less for approximately 3 to 5 hours as noted on the Union County Sheriff's Facebook.*

Figure 4.24 - Wind Chill Chart



According to the NWS, the Wind Chill Chart above includes a frostbite indicator, showing the points where temperature, wind speed and exposure time will produce frostbite on humans. The chart above includes three shaded areas of frostbite danger. Each shaded area shows how long (30, 10 and 5 minutes) a person can be exposed before frostbite develops.

For example, a temperature of 27°F and a wind speed of 10 mph will produce a wind chill temperature of 15°F to 21°F. Although exposed skin in this wind chill temperature wouldn't freeze, the exposure could cause your body temperature to drop and could affect circulation especially for the County's older residents which is 14.5%.

Source: https://www.weather.gov/safety/cold-wind-chill-chart

Risk and Vulnerability Assessment

The vulnerability to winter storms and freezing temperature events can be defined as to the extent to which people will experience harm and property will be damaged from the natural hazard. A severe winter storm or freeze can have a substantial impact on Union County's communities, utilities, transportation systems, telecommunications, and possibly result in loss of life due to accidents or hypothermia.

Ice accumulation accompanied by high winds can have destructive impacts to trees, power lines, road and bridge closures, and utility services. Communications and power are often disrupted while utility companies work to repair the damage. Power and communication disruptions are potential consequences of ice storms and even snow in the county. As confirmed in the probability, the County has limited vulnerability to severe freezes possibly every once in 20 years.

Extended period of time of freezing temperatures further increases the risks of cold weather. Also, injuries or deaths could occur due to the presence of ice on the roadways, and thus putting drivers and utilities, such as power and communication lines, at risk. Strong wind conditions would also help tree limbs with ice weighing on them to fall, which could create power outages or cause injury to property or people. Another source of damages, injuries, or deaths may be related to the incorrect use of heating sources that would create fires.

Freezing temperatures could pose a major hazard to the agriculture industry and are a significant threat to the economic vitality of the state's critical agriculture industry.

Vulnerability for Union County's Structures, Facilities, and Infrastructure

Union County's buildings, infrastructure and critical facilities could have some impact from a winter storm or freeze event with power interruptions or frozen pipes. Back-up power is crucial for the county's critical facilities and infrastructure. Also, without winterized equipment for snow or ice accumulation this could lead to minor roadway icing and road closures disrupting normal daily activities for the residents.

Vulnerability for the Union County's Population

Union County had a negative growth rate of -0.2% from 2010 to 2019 with population total in 2019 of 15,505. The % projected assessment for the population growth from 2019 to 2020 is -0.1%, or an estimated population total of 15,488. The entire population would be at risk and vulnerable to winter storm and freezing temperature leaving several homes without heat or water resulting in shelter needs to assist and care. The most vulnerable residents would be the elderly, the poor, the sick, the special needs, the poor and the mobile home residents.

Table 4.42 – Estimated % of the Population that could be Affected by a Winter Storm/Freeze Event

Estimated % of the Union County Population that could be affected by a Winter Storm/Freeze Occurrence	
% of 65 years of age over	14.5% or approximately 2,211 elderly residents (based on data from Table 3.3)
% of children 5 years or younger	5.5%, or approximately 849 children (based on data from Table 3.3)

% in poverty, all ages	20.6% or approximately 3,139 residents (based on data from Table 3.5)

Summary details for winter storm/freezing events:

Probability of Future Occurrences	Based on past occurrences, the probability of winter storm and freeze occurrence in Union County is low for winter storms to possibly median for freezing temperatures (winter storms at least 1 occurrence every 10 years, and freezing temperatures at least 1 occurrence every 3 years).
Geographic Area	The entire planning area (the City of Lake Butler, the Town(s) of Worthington Springs and Raiford, and unincorporated areas of Union County) is at risk to winter storms and freezing temperatures.
Extent	**Winter Storms** Winter storms can create a higher risk of car accidents, hypothermia, frostbite, carbon monoxide poisoning, and heart attacks from overexertion. Winter storms and blizzards can bring extreme cold, freezing rain, snow, ice, and high winds. In addition a winter storm can last a few hours or several days; knocking out heat, power, and communication services; and placing older adults (14.5% of the County population), young children (5.5% of the County population), and sick individuals at greater risk. As noted, Union County experienced freezing temperatures and winter weather during December 2000 – January 2001 per FEMA Declaration #1359,however IA or PA information was not available. **Freeze** 19th Century data: Based on historical data for the State of Florida, the record low temperature recorded for Union County **6.08 °F** on February 13, 1899. This recorded temperature would be the extreme and worst-case scenario. With this record cold temperature 6.08°F and "if" the wind speed was 10 mph, it would have produced a wind chill temperature between -4°F to -10°F. Under those conditions, exposed skin could freeze in 30 minutes. In addition, this exposure could cause your body temperature to drop and would affect circulation especially for the County's older residents which is 14.5%. The County also suffered the effects from the Storm of the Century in March 1993; and in the incident period (12/1/2000 – 1/25/2001), the County experienced freezing temperatures per FEMA Declaration #1359, and in January 2016.
Impact	The Union County agricultural community and the residents would be impacted from a lengthy and damaging winter storm/freezing event. With over 308 farms in the county and a market value of the agricultural products (crops and livestock) sold of: $7,703,000 (data recorded from the 2017 Census of Agriculture), the effect could be considerable loss in revenue for the county.

Future Land Use

Buildout and Safe-Growth Analyses

The LMS Working Group discussed developing a buildout and safe-growth analysis for Union County's future planning. It was established that mitigation be evaluated and documented in all planning and inserted into our daily practices. It was determined that not only does the County want to look at how development will occur into the future, but also how development affects the County's risks and incorporate methods to safely grow in the future.

Table 4.43 – Building Inventory by Occupancy Type, 2020 in Union County

Type of Structure	County (Unincorporated)	City of Lake Butler	Town of Worthington Springs	Town of Raiford
Single Family Residential	928	336	48	42
Multi-Family Residential	1	33	0	0
Mobile Homes	1041	91	20	26
Agricultural	2759	29	26	22
Commercial and Industrial	38	72	16	8
Government	75	37	11	2
Institutional	54	43	8	7
Miscellaneous	50	21	6	1
Total	**4,946**	**662**	**135**	**108**

Source: Union County Property Appraiser, September 2020

By Florida Statute, counties are required to review and revise their Comprehensive Plan (COMP) every seven years through the Evaluation Appraisal and Review (EAR) process. The LMS Working Group recognizes the importance of incorporating the new EAR as the new data could change future conditions throughout the county in terms of development and thus vulnerability. After a new EAR is formally approved and adopted and during the subsequent review (whether annual or 5-year) of the LMS, the Working Group will evaluate and incorporate any new data as needed into the LMS.

The future land use element from the Union County COMP outlined is an important aspect in planning a buildout and safe-growth analyses and will be evaluated as amended. In addition, the Future Land Use Map should be viewed along with other important maps for the County.

FUTURE LAND USE GOAL, OBJECTIVES AND POLICIES

This Future Land Use Element and Future Land Use Plan map designates the future general distribution, location and extent of the uses of land within the unincorporated areas of the County. It provides for the appropriate distribution of population densities and building and structural densities and intensities. The following goal, objectives and policies provide for allocation of future land uses as well as guidance for its distribution. The focal point around which this Future Land Use Element is centered is the relationship between urban development areas and rural areas of the County, and the uses and intensity of each of those areas. The rural character of the unincorporated areas of the County provides opportunity for guiding direction, location and concentration of future urban uses. The concentration of urban uses within urban development areas of the County will enable both public and private sectors to feasibly plan for the public facilities and services needed to serve the residents of the County.

GOAL, OBJECTIVES AND POLICIES

GOAL I - IN RECOGNITION OF THE IMPORTANCE OF CONSERVING THE NATURAL RESOURCES, DISCOURAGING URBAN SPRAWL, AND ENHANCING THE QUALITY OF LIFE IN THE COUNTY, DIRECT DEVELOPMENT TO THOSE AREAS WHICH HAVE IN PLACE OR HAVE AGREEMENTS TO PROVIDE, THE LAND AND WATER RESOURCES, FISCAL ABILITIES AND SERVICE CAPACITY TO ACCOMMODATE GROWTH IN AN ENVIRONMENTALLY ACCEPTABLE MANNER.

OBJECTIVES AND POLICIES FOR URBAN DEVELOPMENT AREAS

Urban development areas are those areas shown on the County's Future Land Use Plan Map. These areas are not urban service areas for public facilities, but are areas to which higher density agricultural, residential (single family, multi-family, and mobile homes) and commercial and industrial uses are to be directed so that at such time as public facilities may be provided, they can be done so in an efficient and economical manner.

OBJECTIVE I.1

The County shall continue to coordinate future population growth and associated urban development to urban development areas through the establishment of such urban development areas within this Comprehensive Plan. The total area of all the County's urban development areas shall be limited to 10 percent of the total acreage within the County and discourage the proliferation of urban sprawl.

Policy I.1.2 -The County shall allocate amounts and mixes of land uses for residential, commercial, industrial, public and recreation to meet the needs of the existing and projected future populations.

OBJECTIVES AND POLICIES FOR RURAL AREAS

Rural areas are those areas located outside the designated urban development areas shown on the County's Future Land Use Plan Map.

OBJECTIVE I.2

The County shall continue to maintain the rural character of rural areas by limiting development activity to those uses and densities which are identified within the following policies.

Policy I.2.1 The County shall permit agricultural, conservation, recreation and public uses, the processing, storage and sale of agricultural products, professional and vocational services, conventional single family dwellings, mobile homes, churches and other houses of worship.

Policy I.2.2 The County's land development regulations shall be based on and be consistent with the following land use classifications and corresponding standards for densities and intensities within the rural area of the County. For the purpose of this policy and Comprehensive Plan, the phrase "other similar uses compatible with" shall mean land uses that can co-exist in relative proximity to other uses in a stable fashion over time such that no other uses within the same land use category are unduly negatively impacted directly or indirectly by the use.

OBJECTIVES AND POLICIES FOR BOTH URBAN DEVELOPMENT AREAS AND RURAL AREAS

OBJECTIVE I.4

The County shall continue to include within the site plan review process that adjacent land uses shall not be adversely impacted by any change in land use by requiring a landscaped buffer of not less than 10 feet along the affected rear and/or side yards which abut lands within a residential land use category.

Policy I.4.1 Neighborhood commercial activities are small scale retail service establishments which will serve the convenience needs of adjacent areas within the designated urban development areas and the rural areas of the County. Neighborhood Commercial activities are not shown on the Future Land Use Plan Map; rather these commercial activities should be accommodated throughout the County as market forces determine the need according to selected criteria.

OBJECTIVE I.5
The County shall continue to work towards the elimination or reduction of uses inconsistent with the County's character and future land uses, provided that no dwelling unit, which was lawful prior to the adoption of this Comprehensive Plan, shall be considered or classified as a non-conforming inconsistent use through establishing such inconsistent uses as non-conformities.

OBJECTIVE I.6
The County shall continue to use a historic preservation agency appointed by the Board of County Commissioners to assist the Board of County Commissioners with the designation of historic landmarks and landmark sites or historic districts within the unincorporated area of the County based upon criteria utilized for the National Register of Historic Places and the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings.

OBJECTIVE I.7
The County shall continue to enforce regulations to protect natural resources and Environmentally Sensitive Areas-1 lands (including but not limited to wetlands and floodplains.

OBJECTIVE I.8
The County shall continue to coordinate all Future Land Use Plan Map amendments with local, state and regional organizations and agencies to assist the County with the identification of any potential impacts to regional resources which may be caused by the development, to regional resources identified in the Suwannee River Regional Resource Planning and Management Plan prepared pursuant to Chapter 380, Florida Statutes.
Policy I.8.1 - The County shall require that all proposed development which is subject to the provisions of any regional resource planning and management plan be consistent with such plan and that the proposed development be reviewed for such consistency during the development review process.

OBJECTIVE I.9
The County shall request assistance from the Water Management District with the review of subdivision plat construction plans of all proposed subdivision plats within the drainage basin of any designated priority water body to provide the Water Management District an opportunity to review such subdivision plats and site and development plans to determine if the development is not inconsistent with any approved management plans within that basin.

OBJECTIVE I.10
The County shall continue to regulate the location of development consistent with United States Department of Interior Geodetic Survey topographic information and soil conditions as identified within the United States Department of Agriculture Natural Resources Conservation Service, Soil Survey for the County.

OBJECTIVE I.11
The County shall require that proposed subdivisions be approved only where the public facilities meet or exceed the adopted level of service standard.

OBJECTIVE I.12
The County shall maintain innovative Planned Residential Development regulations. The purpose of the Planned Residential Development regulations is to permit Planned Residential Developments within both the designated urban development areas and rural areas of the County which are intended to

1. Encourage the development of land as planned residential developments;
2. Encourage flexible and creative concepts of site planning;
3. Preserve the natural amenities of the land by encouraging scenic and function open areas;

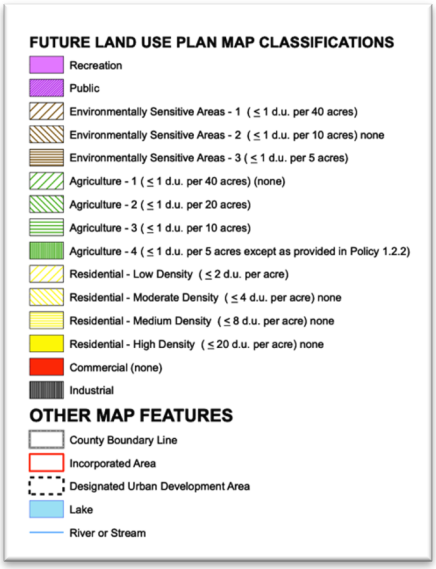
4. Accomplish a more desirable environment than would be possible through the strict application of the minimum requirements of zoning and subdivision requirements;
5. Provide for an efficient use of land resulting in smaller networks of utilities and streets and thereby lowering development and housing costs; and
6. Provide a stable environmental character compatible with surrounding areas.

Future Land Use Map (FLUM)

The future land use map is a community's visual guide to future planning. The future land use map should bring together most if not all of the elements of the County's comprehensive plan It is a map of what the community wants to have happen or a visual guide to future planning; it is not a prediction.

The categories in Union County's Future Land Use Map, Figure 4.26 are defined as follows in the comprehensive plan.

Figure 4.25 – Future Land Use Map Classifications

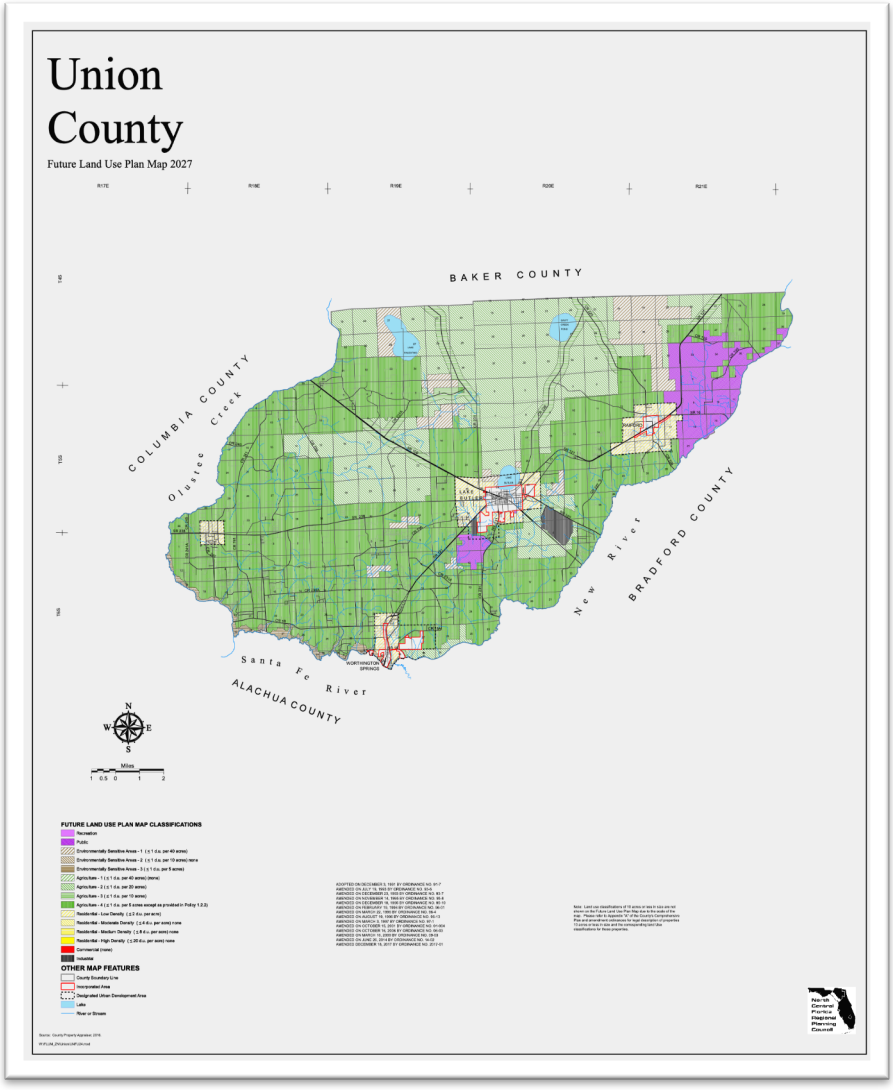


The Future Land Use Plan Map was amended on December 18, 2017 by Ordinance No. 2017 - 01 identifies the category areas for Union County; recreation, public, environmentally sensitive areas 1 -3, agriculture 1 – 4, residential (low to high density), commercial, and industrial.

The map classification identifies that most of the county is agricultural. The jurisdictions specific are the City of Lake Butler, the Town of Raiford, and the Town of Worthington Springs with an overall population growth rate expected to increase at a slow rate of 0.6% over the next five years (2020 – 2025).

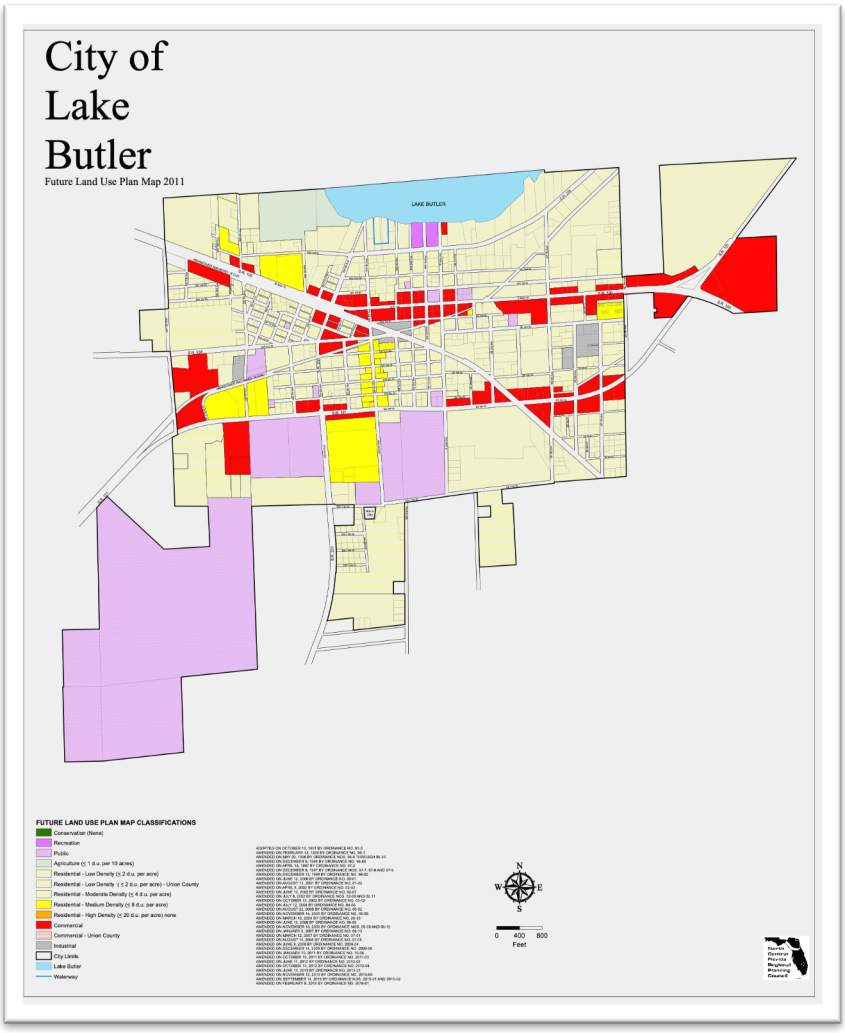
Agriculture and Woodland
According to the 2017 USDA Census of Agriculture, there are a total of 308 farms in Union County. These farms comprise a total of 53,767 acres, nearly 34% of the land in the County. Also, approximately 123,000 acres, or approximately 78% of the County is woodland or forested area. In this analysis, the projected land use for the county will remain predominately agricultural.

Figure 4.26 - Union County, Future Land Use Map (FLUM)



Source: Union County; North Central Florida Regional Planning Council

Figure 4.27 – City of Lake Butler, Future Land Use Map (FLUM)



Source: Union County, North Central Florida Regional Planning Council

As stated, Union County's projected growth rate for 2025 is only 0.6% increase in residents. Despite Union County's historically slow and negative growth rate over the past few years, the County still has much room for growth. It is clear that of the hazards with geographic boundaries, the county needs to predominantly consider wildfire and flood in directing future development. These two hazards areas have the highest number of acreage in urbanized areas, as well as the highest potential for additional future losses in the future. The county should however keep all hazard areas in mind when permitting new development, so that development in these areas can be avoided or properly mitigated.

The future land use element indicates maximum densities of 8 dwelling units per acre. It is recommended that the county explore the possibility of promoting higher density, more compact, clustered, mixed use development in low to no-hazard areas of the City of Lake Butler and the Town(s) of Worthington Springs and Raiford. Doing so will help conserve and efficiently manage resources related to emergency management and hazard mitigation, promote more affordable site-built housing to reduce reliance on mobile homes, and increase development in areas which are not hazardous.

Section 5 – Mitigation Strategy

Requirements:

§201.6(c)(3): Does the Plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs?
§201.6 (c) (3) (i) - The hazard mitigation strategy shall include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.
§201.6 (c) (3) (ii) A section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.
§201.6 (c) (3) (ii) -The mitigation strategy must also address the jurisdiction's participation in the National Flood Insurance Program (NFIP), and continued compliance with NFIP requirements, as appropriate
§201.6(c)(3)(iii): [The mitigation strategy section shall include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.
§201.6(c)(3)(iv):Does the Plan identify mitigation actions for every hazard posing a threat to each participating jurisdiction?
Requirement 201.6(c)(4)(ii):The updated plan must explain how the jurisdictions incorporated the mitigation plan, when appropriate, into other planning mechanisms as a demonstration of progress in local hazard mitigation efforts.
Does the Plan identify the position, office, department, or agency responsible for implementing and administering the action/project, estimated cost, potential funding sources and expected timeframes for completion?
Does the LMS identify the local planning mechanisms where hazard mitigation information and/or actions may be incorporated?
Does the plan describe each community's process to integrate the data, information, and hazard mitigation goals and actions into other planning mechanisms?

The Union County Local Mitigation Strategy outlines the goals and objectives that will lead mitigation efforts in each participating jurisdiction (i.e. the City of Lake Butler, the Town(s) of Worthington Springs and Raiford, and Unincorporated Union County) over the next 5 years. The implementation plan to accomplish these initiatives is offered below, while specific measures for each jurisdiction are listed in Appendix B.

The following procedures in updating the Union County Mitigation Strategy include:

- ✓ Reevaluate and approve mitigation goals and objectives
- ✓ Review and examine the existing mitigation projects/initiatives and/or action items
- ✓ Identify new mitigation projects/initiatives and/or action items
- ✓ Prioritize all mitigation projects/initiatives and/or action items
- ✓ Determine all appropriate funding sources

Each of these components ensures that the County has an established mitigation strategy that helps reduce its vulnerability.

Union County LMS Mitigation Goals and Objectives

Union County's LMS Mitigation Goals and Objectives are intended to reduce or avoid the long-term vulnerability to the effects of the profiled hazards addressed in the risk assessment area in Section 4.

The mitigation goals are comprehensive long-term policy and vision statements that explain what is to be achieved putting the mitigation strategy into action.

In the planning process the Working Group establishes goals for the entire planning area and all of the participating jurisdictions. The current goals and objectives were reviewed and carefully evaluated. It was determined that they needed revisions and updates based on the following criteria:

- ✓ They reflect the updated risk assessment
- ✓ They were analyzed and re-evaluated which lead to the current mitigation projects that will reduce the vulnerability for each jurisdiction
- ✓ They did support to the changes made in the mitigation priority list, and
- ✓ They provided the direction needed to reflect the current State of Florida goals for mitigating hazards within the counties

The mitigation goals for 2020 address the vulnerability of the Union's citizens, the critical facilities, and the private and public buildings. Improving public awareness of hazard risk and mitigation and ensuring that the entire community has the knowledge on how to prepare for and respond to all hazard events. The goals and objectives were evaluated and updated.

Table 5.1 - Union County LMS Mitigation Goals & Objectives

Mitigation Goals and Objectives to Reduce Risk					
Goal and Objectives	**Mitigation Options**	**Hazards the mitigation options will benefit in the mitigation efforts** *(only selected hazards are compared in this table)*			
		Flood	**Hurricane/ Tropical Storm**	**Tornado**	**Wildfire**

1. Prevention Government administrative or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses.	The actions that influence land or building development are as follows: Building codes * Density controls Design review standards Easements Environmental review standards Floodplain development regulations * Floodplain zoning * Forest fire fuels reduction Hillside development regulation Open space preservation Performance standards Setback regulations * Special use permits Stormwater management regulations Subdivision and development regulations * These mitigation options should also be considered for **riverine erosion**.				
		X	X	X	
		X	X		X
		X	X	X	X
		X	X		X
		X	X	X	X
		X	X		
		X	X		
					X
					X
		X	X		X
		X	X	X	X
		X	X		
		X	X		X
		X	X		
		X	X	X	X
2. Property Protection Actions that involve the modification of existing buildings or structures to protect them from a hazard, or removal from the hazard area.	The modification options for existing buildings or structures are as follows: Acquisition of hazard-prone structures Construction of barriers around structures Elevation of structures Relocation out of hazard areas Structural retrofit				
		X	X		X
		X	X		
		X	X		
		X	X		X
		X	X	X	
3. Emergency Services Protect people and property during and immediately after a disaster or hazard event.	The protection measures to people and property are as follows: Critical family protection Emergency response services Hazard threat identification Health and safety maintenance Post-disaster mitigation				
		X	X	X	X
		X	X	X	X
		X	X	X	X
		X	X	X	X
		X	X	X	X

4. Natural Resource Protection Preserve or restore the functions of natural systems that will minimize hazard losses.	Actions to preserve or restore natural systems are as follows: Best management practices Forest and vegetation management Sediment and erosion control regulations * Stream dumping regulations * Urban forestry and landscape management Wetlands development regulations * * These mitigation options should also be considered for **riverine erosion**.				
		X X X X X X	X X X X		X X X X
5. Structural Projects Construction of structures to reduce the impact of a hazard.	The construction actions to reduce a hazard impact are as follows: Channel maintenance Levees and floodwalls Safe rooms/shelters				
		X X	X X X	 X	
6. Public Education and Awareness Inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them.	The types of actions to inform and educate the citizens are as follows: Hazard information center Public educations and outreach programs Real Estate disclosure				
		X X X	X X X	X X X	X X X

Summary Overview of the Goals and Policy Objectives

As Union County's LMS plan continues to evolve, the goals will be reviewed on an annual basis at an LMS meeting to ensure that they are applicable to meeting the unique needs of the community. The LMS Goals and Objectives were reviewed and updated with the Working Group at the October 7, 2020 meeting. The Working Group members

concluded that the 2020 goals and objectives met the needs for the county and were incorporated in this LMS annual plan update.

Mitigation Initiatives

Existing Authorities, Policies, Programs & Resources
With regard to mitigation, these are the existing authorities, policies, programs and resources for Union County, City of Lake Butler and the Town(s) of Worthington Springs and Raiford.

Union County

Union County is governed by a County Commission, composed of elected officials from five districts who collaborate with the LMS Working Group. The Union County Emergency Management Office is responsible for initiating all Working Group activities, maintaining the plan, and leading most mitigation project activities in coordination with the other local departments and agencies. The local government representatives are active in the mitigation efforts for the County.

Union County Resources, Policies & Programs
The County's mitigation resources reside in several areas and the county continues to actively pursue mitigation grant funding and understands how to leverage multiple fund sources to achieve mitigation activities. Policies that would be considered as hazard mitigation exist within the County's comprehensive plan and the land development regulations plan.

Union County's EM Director administers the mitigation grant program. The most serious limitation facing the County with regard to mitigation efforts is the financial capacity to find matching funds for mitigation grant projects, and funding for additional staff to manage the complexities of the grants themselves. The County has a strong history of applying for and receiving mitigation grants and completing mitigation projects or initiatives.

Grants & Programs
Mitigation Grants for Residential and Commercial Properties
The County, the City of Lake Butler, and the Town of Worthington Springs continue to encourage and support grant applications for retrofitting existing structures by participating in all HMGP grant cycles and the annual federal grant programs such as the Flood Mitigation Assistance (FMA) Program and the Pre-Disaster Mitigation (PDM) Program.

FEMA's Hazard Mitigation Grant Program (HMGP)
The County applies for all available federal funding including post-disaster HMGP grants. The key purpose of the HMGP grant program is to enact mitigation measures that reduce the risk of loss of life and property from future disasters.

State Housing Initiatives Partnership (SHIP) Program
The Suwanee River Economic Council manages the SHIP program, which provides funds to local governments as an incentive to create partnerships that produce and preserve affordable homeownership and multifamily housing. The program was designed to serve low and moderate income families. Although the replacement of windows, doors, roofs and other housing elements are considered to be maintenance activities, because these items are installed or constructed in accordance with current building codes this results in homes that are stronger and more protected against potential damages from natural hazards. The county has been implementing this program since its inception in the early 1990's.

City of Lake Butler

The City of Lake Butler is the county seat and operated under the Council-Manager form of government. The City Commission is elected by the voters and, in turn, the Commission appoints a professionally trained individual as its City Manager. All of the seats on the Commission are at-large seats which means all commissioners represent the city at large and not any particular district. Currently, there is the mayor, the vice-mayor/commissioner, and three other commissioners that are governed by the City Council. The City Manager is an active member of the LMS Working Group. The Planning and Zoning Department implements all of the development and permitting activities for the City, including the enforcement of the City's flood damage prevention regulations. A Public Works Director manages the local infrastructure such as roads and bridges, and emergency management services are handled through coordination between the City Manager's office and the Sheriff's Department.

City of Lake Butler's City Resources, Policies & Programs

The City of Lake Butler participates in regular mitigation programs with the County. Policies that would be considered as hazard mitigation exist within the land development regulations plan and the comprehensive plan. The City applies for mitigation grants for the City's infrastructure repair or maintenance.

Town of Worthington Springs

The Town of Worthington Springs is governed by a Town Council composed of five council members, a mayor, a town clerk and a City attorney. The Town Clerk is an active member of the LMS Working Group.

Town of Worthington Springs Resources, Policies & Programs

The town has a small staff and limited financial resources and participates in regular mitigation programs with the County. Policies that would be considered as hazard mitigation exist within the comprehensive plan and the town's ordinance.

Town of Raiford

The Town of Raiford is governed by a Town Council composed of five council members, a mayor, a town clerk and an attorney. The Town Mayor is an active member of the LMS Working Group.

Town of Raiford's Resources, Policies & Programs

The town's staff is very small and has limited financial resources and participates in regular mitigation programs with the County. Policies that would be considered as hazard mitigation exist within the comprehensive plan.

Future Planning for Policies, Programs, and Resources

Discussion with the working group members and evaluation on mitigation integration with the County's, City and the two Town's policies it was determined that every two years, if needed, or within the 5-year LMS Plan update cycle, the Emergency Management Director will invite the Working Group members to participate and assist by reviewing the County, the City of Lake Butler, the Town of Worthington Springs, and the Town of Raiford (at a minimum) local policies, ordinances and other programs where mitigation may be better aligned.

The following plans, ordinances, maps and programs will be analyzed (if needed):

- ✓ Union County Comprehensive Plan
- ✓ Union County Land Development Regulations
- ✓ City of Lake Butler's Comprehensive Plan
- ✓ City of Lake Butler's Land Development Regulations
- ✓ Town of Worthington Springs Comprehensive Plan
- ✓ Town of Worthington Springs Ordinance

- ✓ Town of Raiford Comprehensive Plan
- ✓ Union County Comprehensive Emergency Management Plan
- ✓ Suwannee River Water Management District (SWRMD) Strategic Plan
- ✓ FEMA Flood Insurance Rate Maps (FIRM)
- ✓ Hazard Mitigation Assistance (HMA) Grants - analyze any additional mitigation opportunities for the County

All integration updates will be documented and noted in the next LMS plan update. As stated in Section 4 - The LMS Working Group will continue to discuss developing a buildout and safe-growth analysis for Union County's future planning. It was established that mitigation be evaluated and documented in all planning and inserted into our daily practices. It was determined that not only does the County want to look at how development will occur into the future, but also how development affects the County's risks and incorporate methods to safely grow in the future.

National Flood Insurance Program (NFIP), and continued compliance with NFIP requirements

As stated by FEMA… "The NFIP is aimed at reducing the impact of flooding on private and public structures. This is achieved by providing affordable insurance for property owners and by encouraging communities to adopt and enforce floodplain management regulations. These efforts help mitigate the effects of flooding on new and improved structures. Overall, the program reduces the socio-economic impact of disasters by promoting the purchase and retention of Risk Insurance in general, and National Flood Insurance in particular."

Source: https://www.fema.gov/national-flood-insurance-program

Compliance with NFIP

Three jurisdictions within the County participate with NFIP and one jurisdiction does not, See table(s) 5.2a and 5.2b.

Tables 5.2-a - Union County Participation in the NFIP as of 6/14/2020

CID #	Community Name	County	Init FHBM Identified	Init FIRM Identified	Curr Eff Map Date	Reg- Emer Date	Tribal
120422B	Union County	Union County	12/2/1977	8/4/1988	11/2/2018	8/4/1988	No

120595B	City of Lake Butler	Union County	9/22/1978	7/3/1986	11/2/2018	7/3/1986	No
120594B	Town of Worthington Springs	Union County	10/13/1978	6/3/1986	11/2/2018	6/3/1986	No

Note: The Town of Raiford **does not participate** in the NFIP. Details from the FEMA Community Status Book Report for the State of Florida, Communities not in the National Flood Program states that the Town of Raiford is not in the program with hazard area identified.

Tables 5.2-b – Town of Raiford as of 6/14/2020

CID #	Community Name	County	Init FHBM Identified	Init FIRM Identified	Curr Eff Map Date	Sanction Date	Tribal
120593#	Town of Raiford	Union County	9/29/1978	2/4/2009	2/4/2009	9/29/1979	No

Table 5.3 - NFIP Insurance Report as of 11/30/2018

Community Name	Policies In-force	Insurance In-force whole $	Written Premium In-force
Union County	50	$10,444,700	36,224
City of Lake Butler	4	$792,000	4,443
Town of Worthington Springs	N/A	N/A	N/A
Unknown for Community Number	1	$37,200	728
Total	**55**	**$11,273,900**	**41,395**

Source: https://nfipservices.floodsmart.gov//reports-flood-insurance-data

Repetitive Loss (RL) Property

As noted by FEMA… "A Repetitive Loss (RL) property is any insurable building for which two or more claims of more than $1,000 were paid by the NFIP within any rolling ten-year period since 1978. The property may or may not be currently insured by the NFIP. Structures that flood frequently strain the National Flood Insurance Fund and these properties are the biggest draw on the Fund."

With the increase in NFIP's annual losses and the need for borrowing, the repetitive loss properties drain funds needed to prepare for catastrophic events. Community leaders and the county residents are also concerned with these properties because their lives are disrupted and may be threatened by the continual flooding. The primary objective of the RL properties strategy is to eliminate or reduce the damage to property and the disruption to life caused by repeated flooding of the same properties.

Per the FEMA report, November 2020, there are 2 repetitive loss properties identified in Union County. The totals represent all unmitigated NFIP repetitive loss and severe repetitive loss properties even if not currently insured.

Unincorporated Union County

- ✓ There was 2 residential RL properties located in the Unincorporated area of Union County.

City of Lake Butler

- ✓ There were no RL properties identified in the City of Lake Butler

Town of Worthington Springs

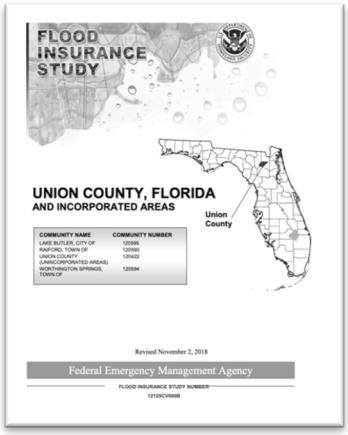
- ✓ There were no RL properties identified in the Town of Worthington Springs.

Town of Raiford

- ✓ There were no RL properties identified in the Town of Raiford.

Union County NFIP Overview Compliance

As of November 30,2018, see table 5.3 there are currently 50 flood insurance policies in force. Current flood maps were updated and adopted February 4, 2009 and there were changes to Special Flood Hazard Areas, zone designations, and update topographic information with a revised FIS effective date: November 2, 2018. As part of the countywide FIS, flooding caused by overflow of the Santa Fe River was studied in detail. Additionally, one unnamed tributary to the Santa Fe River with reported flooding problems was studied in detail as part of the initial countywide FIS. Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The areas studied were selected with priority given to all known flood hazard areas and areas of projected development or proposed construction. The scope and methods of study were proposed to and agreed upon by FEMA, SRWMD and Union County.



Physical Map Revision (PMR), Effective November 2, 2018

For this PMR, Lake Butler, Deckles Millpond, and Fivemile Creek were studied using detailed methods. In addition, Unnamed Tributary to Santa Fe River was redelineated as a part of this revision by utilizing the profiles and floodway data tables from the February 4, 2009 revision. An updated digital elevation model (DEM) derived from LiDAR flown in 2011 was used to map this flooding source. These profiles can be found in FIS #12125CV000B dated November 2, 2018. Prior to that date Union County was using flood maps from February 4, 2009.

Union County will continue to comply with the NFIP program and enforce floodplain management regulations. The following actions have been identified, analyzed, and prioritized as necessary steps to remain in compliance with the program:

- ✓ Continue to enforce the most current Florida Building Code, Land Development Regulations, and Comprehensive Plans;
- ✓ The County will continue to preserve and enforce their adopted Floodplain Management requirements from the Land Development Regulations, Article 8, which include regulating all new development and substantial improvements in Special Flood Hazard Areas (SFHA) – *see specifics regarding Article 8 below*;

- ✓ Provide current Special Flood Hazard Area Maps for analysis and review which are located at the Building Department;
- ✓ Continue outreach programs to the public with special emphasis for the properties lying in the repetitive flood areas;
- ✓ Continue to provide up-to-date the Flood Insurance Rate Maps (FIRM) information to all interested parties;
- ✓ Manage and monitor all elevation certificates and maintain records and copies for anyone to review;
- ✓ Proceed to assist local insurance agents with obtaining correct FIRM's and flood insurance rates;
- ✓ Continue to participate in all hazard mitigation efforts to include working with Union County's Emergency Management to maintain and monitor hazard data for future planning;
- ✓ Submit all information to FEMA necessary to keep current FIRM's as accurate as possible;
- ✓ The Union County Emergency Management will continue to work closely with the Building Department to map areas that are prone to frequent floods and track repetitive loss properties. After a disaster event all damaged structures are inspected and the damage documented. The EM office maintains flood mitigation information for the county citizens to review on flooding issues, which include retrofitting, safety, insurance, maps, historical data, and many other sources of information; and
- ✓ Participate whenever possible in any future flood studies.

Union County Land Development Regulations

Article Eight – Flood Damage Prevention Regulations

Section 8.1.2 - Scope. The provisions of this Article shall apply to all development that is wholly within or partially within any flood hazard area, including but not limited to the subdivision of land; filling, grading, and other site improvements and utility installations; construction, alteration, remodeling, enlargement, improvement, replacement, repair, relocation or demolition of buildings, structures, and facilities that are exempt from the Florida Building Code; placement, installation, or replacement of manufactured homes and manufactured buildings; installation or replacement of tanks; placement of recreational vehicles; installation of swimming pools; and any other development.

Section 8.1.3 - Intent. The purposes of this Article and the flood load and flood resistant construction requirements of the Florida Building Code are to establish minimum requirements to safeguard the public health, safety, and general welfare and to minimize public and private losses due to flooding through regulation of development in flood hazard areas to: 1. Minimize unnecessary disruption of commerce, access and public service during times of flooding; 2. Require the use of appropriate construction practices in order to prevent or minimize future flood damage; 3. Manage filling, grading, dredging, mining, paving, excavation, drilling operations, storage of equipment or materials, and other development which may increase flood damage or erosion potential; 4. Manage the alteration of flood hazard areas, watercourses, and shorelines to minimize the impact of development on the natural and beneficial functions of the floodplain; 5. Minimize damage to public and private facilities and utilities; 6. Help maintain a stable tax base by providing for the sound use and development of flood hazard areas; 7. Minimize the need for future expenditure of public funds for flood control projects and response to and recovery from flood events; and 8. Meet the requirements of the National Flood Insurance Program for community participation as set forth in the Title 44 Code of Federal Regulations, Section 59.22.

Section 8.1.5 Warning. The degree of flood protection required by this Article and the Florida Building Code, as amended by the Board of County Commissioners, is considered the minimum reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger floods can and will occur. Flood heights may be increased by man-made or natural causes. This Article does not imply that land outside of mapped special flood hazard areas, or that uses permitted within such flood hazard areas, will be free from flooding or flood damage. The flood hazard areas and base flood elevations contained in the Flood Insurance Study and shown on Flood Insurance Rate Maps and the requirements of Title 44 Code of Federal Regulations, Sections 59 and 60 may be revised by the Federal Emergency Management Agency, requiring the Board of County Commissioners to revise these regulations to remain

eligible for participation in the National Flood Insurance Program. No guaranty of vested use, existing use, or future use is implied or expressed by compliance with this Article.

City of Lake Butler NFIP Compliance

As noted in Table 5.2a, the City of Lake Butler has been participating in the NFIP since July 3, 1986 with Community Identification Number: 120595B. As of November 30, 2018, the City has issued 4 flood insurance policies.

The City of Lake Butler will continue to comply with the NFIP program and enforce floodplain management regulations. The following actions have been identified, analyzed, and prioritized as necessary steps to remain in compliance with the program. The City will continue to:

- ✓ Enforce the most current Florida Building Code, Land Development Regulations, and Comprehensive Plans;
- ✓ Participate in all hazard mitigation efforts to include working with Union County's Emergency Management to maintain and monitor hazard data for future planning;
- ✓ Provide information to assist homeowner and developer guidance and measures to reduce damage related to the hazards identified in the LMS;
- ✓ The City will continue to preserve and enforce their adopted Floodplain Management requirements from the Land Development Regulations, Article 8, which include regulating all new development and substantial improvements in Special Flood Hazard Areas (SFHA) – *see specifics regarding Article 8 below*;
- ✓ Provide current Special Flood Hazard Area Maps for analysis and review which are located at the City Hall;
- ✓ Manage and monitor all elevation certificates and maintain records and copies for anyone to review;
- ✓ Proceed to assist local insurance agents with obtaining correct FIRM's and flood insurance rates;
- ✓ Furnish up-to-date the Flood Insurance Rate Maps (FIR M) information to all interested parties;
- ✓ The Union County EM will continue to work closely with the City of Lake Butler's City Manager to map areas that are prone to frequent floods and track repetitive loss properties. After a disaster event all damaged structures are inspected and the damage documented. The office also maintains flood mitigation information for the county citizens to review on flooding issues, which include retrofitting, safety, insurance, maps, historical data, and many other sources of information; and
- ✓ Participate whenever possible in any future flood studies.

City of Lake Butler Land Development Regulations

Article Eight – Flood Damage Prevention Regulations

Section 8.1.3 - Intent. The purposes of this Article and the flood load and flood resistant construction requirements of the Florida Building Code are to establish minimum requirements to safeguard the public health, safety, and general welfare and to minimize public and private losses due to flooding through regulation of development in flood hazard areas to: 1. Minimize unnecessary disruption of commerce, access and public service during times of flooding; 2. Require the use of appropriate construction practices in order to prevent or minimize future flood damage; 3. Manage filling, grading, dredging, mining, paving, excavation, drilling operations, storage of equipment or materials, and other development which may increase flood damage or erosion potential; 4. Manage the alteration of flood hazard areas, watercourses, and shorelines to minimize the impact of development on the natural and beneficial functions of the floodplain; 5. Minimize damage to public and private facilities and utilities; 6. Help maintain a stable tax base by providing for the sound use and development of flood hazard areas; 7. Minimize the need for future expenditure of public funds for flood control projects and response to and recovery from flood events; and 8. Meet the requirements of the National Flood Insurance Program for community participation as set forth in the Title 44 Code of Federal Regulations, Section 59.22.

Section 8.1.5 Warning. The degree of flood protection required by this Article and the Florida Building Code, as amended by the Board of County Commissioners, is considered the minimum reasonable for regulatory purposes and

is based on scientific and engineering considerations. Larger floods can and will occur. Flood heights may be increased by man-made or natural causes. This Article does not imply that land outside of mapped special flood hazard areas, or that uses permitted within such flood hazard areas, will be free from flooding or flood damage. The flood hazard areas and base flood elevations contained in the Flood Insurance Study and shown on Flood Insurance Rate Maps and the requirements of Title 44 Code of Federal Regulations, Sections 59 and 60 may be revised by the Federal Emergency Management Agency, requiring the Board of County Commissioners to revise these regulations to remain eligible for participation in the National Flood Insurance Program. No guaranty of vested use, existing use, or future use is implied or expressed by compliance with this Article.

Section 8.2.3 Basis for Establishing Flood Hazard Areas. The Flood Insurance Study for Union County, Florida and Incorporated Areas, dated February 4, 2009 and all subsequent amendments and revisions, and the accompanying Flood Insurance Rate Maps, and all subsequent amendments and revisions to such maps, are adopted by reference as a part of this Article and shall serve as the minimum basis for establishing flood hazard areas. Studies and maps that establish flood hazard areas are on file at the Office of the City Clerk, located at 200 Southwest First Street, Lake Butler, Florida.

Town of Worthington Springs Compliance

As stated in Table 5.2a, the Town of Worthington Springs has been participating in the NFIP since June 3, 1986 with Community Identification Number: 120594B. Details in reference to flood insurance policies in Worthington Springs was not available.

The Town of Worthington Springs will continue to comply with the NFIP program and enforce floodplain management regulations. The following actions have been identified, analyzed, and prioritized as necessary steps to remain in compliance with the program. The Town will continue to:

- ✓ Enforce the most current Florida Building Code, Land Development Regulations in the Comprehensive Plan – *see specifics regarding the Future Land Use Element in the Town's COMP*;
- ✓ The Town remains active and participates in all hazard mitigation efforts to include working with Union County's Emergency Management to maintain and monitor hazard data for future planning;
- ✓ Provide information to assist homeowner and developer guidance and measures to reduce damage related to the hazards identified in the LMS;
- ✓ Manage and monitor all elevation certificates and maintain records and copies for anyone to review;
- ✓ Proceed to assist local insurance agents with obtaining correct FIRM's and flood insurance rates;
- ✓ Furnish up-to-date the Flood Insurance Rate Maps (FIRM) information to all interested parties; and
- ✓ Participate whenever possible in any future flood studies.

Town of Worthington Springs Comprehensive Plan

Future Land Use Element

The Town's land development regulations shall contain specific and detailed provisions to manage future growth and development to implement the Comprehensive Plan, which shall contain at a minimum the following provisions: Policy I.4.1 – c - Protect environmentally sensitive lands identified within the Conservation Element; d - Regulate areas subject to seasonal and periodic flooding and provide for drainage and stormwater management.

Policy I.6.4 - The Town shall participate in the National Flood Insurance Program and regulate development and the installation of utilities in flood hazard areas in conformance with the programs requirements. Further, the Town shall require all structures to be clustered on the non-flood prone portion of a site or where the entire site is in a flood prone area, structures shall be elevated no lower than 1 foot above base flood elevation. Non-residential structures located in A-Zones as designated on the FIRM for the Town, August 4, 1988, may be flood proofed in lieu of being elevated

provided that all areas of the structure below the required elevation area water tight in conformance with NFIP requirements in effect upon the adoption of this COMP.

Policy I.10.3 - The Town's land, upon adoption of the COMP, shall in addition to the provisions stated within policies V.2.4 and V.2.5 of the COMP, require that commercial and industrial structures be prohibited within flood prone areas of the site where other alternatives for development exist.

Policy I.10.4 - The Town's land development regulations shall require in addition to the provisions stated within policies V.2.4 and V.2.5 of the COMP, that where other alternatives for development exist that no lots within a proposed subdivision plat intended to be used with for the location of residential dwelling units be sited within a flood prone area.

Town of Raiford

The Town of Raiford **does not participate** in the NFIP. Details from the FEMA Community Status Book Report for the State of Florida, Communities not in the National Flood Program states that the Town of Raiford is not in the program with hazard area identified. In addition, details in reference to flood insurance policies in Raiford was not available*. It was determined by the Town to* ***"add obtaining status of the NFIP as an important mitigation project for the Town".*** Note: The Town of Raiford does have a COMP which addresses participation in the NFIP and as stated this is an important mitigation project for the Town and County.

Town of Raiford Comprehensive Plan (details reviewed September 2020 for the Raiford COMP)
Future Land Use Element
Policy I.6.4 - The Town shall participate in the National Flood Insurance Program and regulate development and the installation of utilities in flood hazard areas in conformance with the programs requirements.

Conservation Element
Policy V.2.6 - The Town shall require all new development to maintain the natural functions of environmentally sensitive areas, including but not limited to wetlands and 100-year floodplains so that the long term environmental integrity and economic and recreational value of these areas is maintained. In floodplain areas, dredge and fill shall be prohibited and clearing of natural vegetation minimized.
Policy V.2.7 - The Town shall regulate development within 100-year floodplains in order to maintain the flood carrying and flood storage capacities of the floodplains and reduce the risk of property damage and loss of life. In floodplain areas, dredge and fill shall be prohibited and clearing of natural vegetation minimized.
Policy V.2.11 - The Town shall require a 35-foot regulated natural buffer adjacent to all perennial rivers, streams and creeks and prohibit the locations of residential, commercial and industrial land uses within the buffer areas, but allow agriculture, silviculture and resource-based recreational activities within buffer areas subject to best management practices.

Community Rating System (CRS)

The Community Rating System (CRS) is a voluntary program for National Flood Insurance Program (NFIP) participating communities. This program's goals are to reduce flood damages to insurable property, strengthen and support the insurance aspects of the NFIP, and encourage a comprehensive approach to floodplain management. CRS has been developed to provide incentives in the form of premium discounts for communities to go beyond the minimum floodplain management requirements to develop extra measures to provide protection from flooding.

As of October 2020, Union County, the City of Lake Butler and the Town(s) of Worthington Springs and Raiford **do not participate in the CRS**. However, the applications for the CRS status are current LMS projects and the county is hoping to work on the applications within the next few years.

Identification and Analysis of Union County's Mitigation Projects or Initiatives

The Local Mitigation Strategy consists of actions designed to minimize potential losses to natural disasters identified in the risk assessment. The strategy provides for maintaining existing protection mechanisms provided in the County and municipal government comprehensive plans, land development regulations and other implementation mechanisms. The strategy also provides for identifying future local government capital improvements, which, among other purposes, mitigate adverse impacts from natural disasters, and a public information program to educate County residents of the need to prevent and mitigate damage caused by natural disasters.

As part of its strategy, the City of Lake Butler, the Town of Worthington Springs and Unincorporated Union County will maintain its status with NFIP. The County and its associated municipalities will also use any updated floodplain maps prepared as a result of the FEMA Floodplain Map Modernization Program and Repetitive Loss Initiative. When feasible, all products produced through the FEMA's on-going field and database verification projects for repetitive loss properties will be utilized.

The risk assessment identifies Union County is most susceptible to hurricane and tropical storm events, floods, severe thunderstorm and strong winds, wildfires, tornadoes, lightning, drought, and hailstorms. The County and its associated municipalities evaluate their comprehensive plans, land development regulations, and code of ordinances for modifications to improve mitigation measures, with special emphasis on these occurrences. Through the years, Union County will continue to improve its recordkeeping and statistical data with regards to natural disasters for the annual vulnerability assessment. Emergency Management will continue to file and document "impact" details with photos on specific hazard events, which will enhance the LMS plan with a more accurate vulnerability analysis.

The County with the assistance of other related agencies (Florida Department of Transportation (FDOT), SRWMD, and the Florida Forest Service) implements a public education campaign regarding construction within floodable areas, emergency water conservation regulations, as well as minimum housing codes with regards to minimum building standards, the use of Firewise construction and landscaping practices, and burn bans.

Union County Local Mitigation Strategy Projects or Initiatives

Appendix B, contains three separate mitigation project lists (ongoing, completed and deleted). The mitigation projects or initiatives are action items for the identified hazards in Section 4 and addresses the reduction of hazards **on new as well as existing buildings and infrastructure**. It will describe the mitigation project, identify if the hazard has been mitigated, if the goals were achieved through the completion of the project, the funding source, the agency responsible for implementation, the estimated cost or total final costs, the timeframe for completion, and details on the progress of the mitigation project.

They are as follows:

- ✓ the *new, ongoing, and deferred* mitigation projects - (the deferred projects remain active and will be pursued as funding sources are identified or priorities change due to disaster events),
- ✓ the mitigation projects that have been *completed* over the last five years, and
- ✓ the mitigation projects that have been removed or deleted.

Analysis of the Comprehensive Range of Projects

Table 5.4 determines that Union County has a "comprehensive range" of specific mitigation projects that will address the goals to reduce or avoid long-term vulnerability for each jurisdiction and was prepared after analyzing the new, ongoing and deferred mitigation project list.

Table 5.4 – Comprehensive Range of Mitigation Projects

Comprehensive Range of Mitigation Projects - Union County				
Natural Hazards Profiled	**Unincorporated Union County**	**City of Lake Butler**	**Town of Worthington Springs**	**Town of Raiford**
Flooding	x	x	x	x
Sinkhole	x	N/A	x	N/A
Hurricanes and Tropical Storms	x	x	x	x
Tornado	x	x	x	x
Thunderstorms, Strong Winds, Lightning and Hailstorms	x	x	x	x
Riverine Erosion	x	N/A	x	N/A
Wildfire	x	x	x	x
Drought and Heat Wave	x	x	x	x
Winter Storms and Freezing Temperatures	x	x	x	x
All Hazards	x	x	x	x
All requirements are met	x	x	x	x

Appendix B outlines the current mitigation projects or initiatives for each jurisdiction within the county including specifics on the natural hazards that will be mitigated, the agency responsible of overseeing the project, analysis of the initiative and potential funding source, and what jurisdiction will benefit from the mitigation project.

Implementation of the Mitigation Projects

All mitigation projects or initiatives were reviewed, analyzed, and revised according to the list of mitigation projects that were developed and updated in the 2020 LMS Plan. Appendix B contains the list of all mitigation projects for the identified hazards.

As established, the LMS project list includes actions that address the reduction of hazards on new as well as existing buildings and infrastructure, and the mitigation project status over the last 5 years. Details on the project included: if the mitigation project was completed, deferred, deleted or any new projects that have been included as a result of a hazard event.

Prioritization Process and Benefit-Cost Review

In developing the prioritization procedures, it is not the intent to direct that the projects be accomplished in their prioritized order. The purpose of the ranking is to indicate the overall importance of the project to the local mitigation efforts. The accomplishment of an initiative or project will usually depend more on the availability of funds, than on how high or low it ranked compared to other initiatives.

The prioritization process requires the identification of projects and programs that appear to have a reduction in property damage, have technical merit, be cost-effective, and will protect the health, safety and welfare of Union County's citizens and meet the other mitigation benefits noted above.

The first measure in the process is to review and evaluate each of the Local Mitigation Strategy Goals and Objectives identified for each mitigation project. The Goals and Objectives include:

Prevention	Government Administrative or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses.
Property Protection	Actions that involve the modification of existing buildings or structures to protect them from a hazard, or removal from the hazard area.
Public Education and Awareness	Inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them.
Natural Resource Protection	Preserve or restore the functions of natural systems that will minimize hazard losses.
Emergency Services	Protect people and property during and immediately after a disaster or hazard event.
Structural Projects	Construction of structures to reduce the impact of a hazard.

The main emphasis in the prioritization process and selection of the mitigation projects is to promote the projects or initiatives with the greatest mitigation benefits. The second measure in the prioritization process is to evaluate and analyze the benefits:

- ✓ Number of people (from 1 to 10,000 or more) who will benefit
- ✓ The risk rating, according to the community, for the addressed hazard
- ✓ Immediate need or post-disaster priority
- ✓ Enhancement of special needs population or promotion of hazard awareness
- ✓ Reduction of risk to structures that have been repetitively damaged
- ✓ Critical facility or infrastructure
- ✓ Environmentally sound
- ✓ Technically feasible
- ✓ Encourage cooperation among government entities
- ✓ Cost effective

Although the prioritization process includes economic considerations, the project projects will be analyzed for benefit cost based on the guidelines set forth by the state and FEMA.

The method of initiating a detailed and formal Benefit-Cost Analysis (BCA) can be a very time-consuming and tedious process and require professional expertise. The Union County LMS Working Group discussed the BCA process and determined for this 2020 LMS plan that it wasn't feasible to do a formal and extensive analysis on all of the current mitigation projects at this time. However, if future mitigation projects are being considered for funding, that a formal BCA will be performed utilizing the required expertise to execute the required benefit-cost ratio.

The BCA will be calculated on top tiered projects and/or projects which are included in any applications for funding to ensure that the projects are cost effective. Each action is scored individually and is based on the ten weighted criteria developed by the LMS Working Group. The process to prioritize the mitigation actions is accomplished during meetings between LMS Working Group members and officials from the respective local governments. Using the same criteria,

the City of Lake Butler and the Town(s) of Worthington Springs and Raiford prioritizes their own projects before submitting them to the LMS Working Group for review.

Instead of the detailed BCA, the LMS Working Group developed an initial list of mitigation projects or initiatives and a priority score. Each mitigation project or initiative identified for funding will be cost-effective, technically feasible, contribute to the overall strategy outlined in the Local Mitigation Strategy, and be acceptable to regulatory agencies. The prioritization process for the mitigation projects was accomplished by the County LMS Working Group and officials from the respective local governments.

After the projects have been determined for each jurisdiction, they are assigned a priority score. This score is a long-term characterization value directly associated with each specific initiative based on its own merits at the time it was first proposed by the individual participant. The priority is intended to serve as a guideline for the Working Group regarding the relative desirability of implementation of a specific mitigation initiative in relation to the other proposed initiatives incorporated into the plan.

The scores are assigned according to the knowledge and discretion of the Working Group and are not considered exact technical estimates. The mitigation projects scoring with higher point totals have first priority. However, it would be a mistake to assume that only top priority initiatives should be considered for funding, as the priority projects often require significant resources and/or money. In a post-disaster situation, for example after a significant hurricane event, the amount of money available for hazard mitigation projects could be as little as $30,000 or as much as $1 million or more. Therefore, it is important to have initiatives or projects with a range of costs that are rationally prioritized so that the jurisdictions can get the most value for the mitigation money they receive. Furthermore, simply because a mitigation initiative has high associated costs does not mean it is not cost effective.

A mitigation initiative or project may yield significant benefits over the lifetime of the project that far outweighs the initial costs. In lieu of conducting formalized benefit-cost analyses, order of magnitude cost estimates were made by the Union County Working Group assuming that less expensive projects would be easier to obtain funding for and could be implemented more readily.

The mitigation initiatives were assigned priority scores based upon the following criteria according to the Union County's Goals and Objectives for local mitigation and the program funding requirements of FEMA. The LMS Working Group may evaluate these criteria annually, recommending changes to prioritization criteria that are deemed necessary.

The point awarding system for establishing a priority score for each mitigation project is outlined in Table 5.5. The maximum priority score for the project is 100.

Table 5.5 –Point System for the LMS Mitigation Projects

Criteria	Category	Scoring
Number of people who will benefit	10,000 or more	10
	1,000 or more	8
	100 or more	6
	10 or more	4
	1 or more	2
Risk rating for the addressed hazard	40 or more	10
	30 – 39	8

	20- 29	6
	10-19	4
	Less than 10	2
Immediate need or post-disaster priority	Yes	10
Enhancement of special needs population or promotion of hazard awareness	Yes	10
Reduction of risk to structures that have been repetitively damaged	Yes	10
Critical facility or infrastructure	Yes	10
Environmentally sound	Yes	10
Technically feasible	Yes	10
Encourage cooperation among government entities	Yes	10
Cost effective	Yes	10
Total Points *(maximum of 100 points)*		

After a natural disaster event receives a presidential declaration and Union County was designated as a result of the disaster; the county will be eligible for the Hazard Mitigation Grant Program (HMGP) funding. Once the county receives the disaster designation the LMS Working Group will meet to analyze the damage that was sustained. Then in respect to the current conditions in the County, changes in policy and overall mitigation needs, prioritization of projects to be funded will be reviewed for the specific declared disaster.

Potential Funding Sources for the Mitigation Projects

Mitigation projects implemented by the County and municipalities will be dependent on available funding. It is anticipated that the County and municipalities will seek federal, state, and local funds to assist in the implementation of action items involving capital improvements and/or additional personnel. In addition to local and county matching funds, there are numerous funding sources available to counties of all sizes. Table 5.6 is a current list of possible funding sources that can be used for the mitigation projects.

Table 5.6 – Possible Funding Sources

Clean Water State Revolving Funds (CWSRF)	The Clean Water State Revolving Fund (CWSRF) program is a federal-state partnership that provides communities a permanent, independent source of low-cost financing for a wide range of water quality infrastructure projects.
Community Assistance Program State Support	The Community Assistance Program – State Support Services Element (CAP-SSSE) program derives its authority from the National Flood Insurance Act of 1968, as amended, the Flood Disaster Protection Act of 1973 and from 44 CFR Parts 59 and 60. This program

Services Element (CAP-SSSE)	provides funding to states to provide technical assistance to communities in the National Flood Insurance Program (NFIP) and to evaluate community performance in implementing NFIP floodplain management activities. In this way, CAP-SSSE helps to: Ensure that the flood loss reduction goals of the NFIP are met, Build state and community floodplain management expertise and capability and Leverage state knowledge and expertise in working with their communities.
Community Development Block Grant (CDBG)	The Community Development Block Grants (CDBG) provide for long-term needs, such as acquisition, rehabilitation, or reconstruction of damaged properties and facilities and redevelopment of disaster-effected areas. Funds may also be used for emergency response activities, such as debris clearance and demolition, and extraordinary increases in the level of necessary public services. Eligible projects can include; • Voluntary acquisition, or if appropriate, elevation of storm damaged structures; • Relocation payments for displaced people and businesses; • Rehabilitation or reconstruction of residential and commercial buildings; • Assistance to help people buy homes, including down payment assistance and interest rate subsidies; and • Improvements to public sewer and water facilities.
Conservation Reserve Program (CRP)	CRP is a land conservation program administered by Farm Service Agency. In exchange for a yearly rental payment, farmers enrolled in the program agree to remove environmentally sensitive land from agricultural production and plant species that will improve environmental health and quality. Contracts for land enrolled in CRP are 10-15 years in length. The long-term goal of the program is to re-establish valuable land cover to help improve water quality, prevent soil erosion, and reduce loss of wildlife habitat.
County Incentive Grant Program	This program provides grants to counties, to improve a transportation facility which is located on the State Highway System or which relieves traffic congestion on the State Highway System. To be eligible for consideration, projects must be consistent, to the maximum extent feasible, with local metropolitan planning organization plans and local government comprehensive plans.
Economic Adjustment Assistance (EAA) Program	The EAA program provides a wide range of technical, planning, and public works and infrastructure assistance in regions experiencing adverse economic changes that may occur suddenly or over time. These adverse economic impacts may result from a steep decline in manufacturing employment following a plant closure, changing trade patterns, catastrophic natural disaster, a military base closure, or environmental changes and regulations.
Emergency Conservation Program (ECP)	The Emergency Conservation Program (ECP) helps farmers and ranchers to repair damage to farmlands caused by natural disasters and to help put in place methods for water conservation during severe drought. The ECP does this by giving ranchers and farmers funding and assistance to repair the damaged farmland or to install methods for water conservation.

Emergency Management Performance Grant (EMPG)	The purpose of the EMPG Program is to provide federal grants to states to assist state, local, territorial, and tribal governments in preparing for all hazards, as authorized by the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended (42 U.S.C. §§ 5121 et seq.) and Section 662 of the Post Katrina Emergency Management Reform Act of 2006, as amended (6 U.S.C. § 762). Title VI of the Stafford Act authorizes FEMA to make grants for the purpose of providing a system of emergency preparedness for the protection of life and property in the United States from hazards and to vest responsibility for emergency preparedness jointly in the federal government and the states and their political subdivisions. The Federal Government, through the EMPG Program, provides necessary direction, coordination, and guidance, and provides necessary assistance, as authorized in this title, to support a comprehensive all hazards emergency preparedness system.
Emergency Management Preparedness and Assistance Trust Fund/ Municipal Competitive Grant Program	The Emergency Management Competitive Grant Program and Municipal Competitive Grant Program provide competitive grants to state or regional agencies, local governments, and private non-profit organizations to implement projects that will further state and local emergency management objectives. The Municipal Competitive Grant Program provides competitive grants to municipalities that are legally constituted, have an authorized, established, and maintained emergency management program, and have signed the Statewide Mutual Aid Agreement (SMAA). Applications are accepted in the following four categories under both programs: • Projects that will promote public education on disaster preparedness and recovery issues. • Projects that will enhance coordination of relief efforts of statewide private sector organizations, including public-private business partnership efforts. • Projects that will improve the training and operations capabilities of agencies assigned lead or support responsibilities in the State Comprehensive Emergency Management Plan. • Other projects that will further state and local emergency management objectives which have been designated by the State of Florida as priorities in the applicable Notice of Fund Availability.
Environmental Education (EE) Grant	The purpose of the Environmental Education Grant (EEG) is to provide financial support for projects, which design, demonstrate or disseminate environmental education projects, methods, or techniques. Projects must focus on one of the following: (1) improving environmental education teaching skills; (2) education teachers, students, or the public about human health problems; (3) building State, local, or Tribal government capacity to develop environmental education programs; (4) educating communities through community-based organizations; or (5) educating general public through print, broadcast, or other media.
Federal Highway Administration, Planning & Environment, Intermodal and Statewide Programs	The intent of the Federal Highway Administration (FHWA) Intermodal and Statewide Programs is the expeditious development and management of high-quality feasibility studies with FHA funds. Within the context of Title 23 U.S.C. or in 23 CFR guidelines, the meaning of feasibility has the following parts: • The degree to which given alternative modes, management strategy, design or location is economically justified.

	• The degree to which such an alternative is considered preferable from an environmental or social perspective. • The degree to which eventual construction and operation of such an alternative can be financed and managed.
Florida Forever	Florida Forever is Florida's premier conservation and recreation lands acquisition program, a blueprint for conserving natural resources and renewing Florida's commitment to conserve the state's natural and cultural heritage.
Fire Prevention and Safety Grants (FP&S)	The Fire Prevention and Safety Grants (FP&S) are part of the Assistance to Firefighters Grants (AFG), and are administered by the Federal Emergency Management Agency. FP&S Grants support projects that enhance the safety of the public and firefighters from fire and related hazards. The primary goal is to target high-risk populations and reduce injury and prevent death. Eligibility includes fire departments, national, regional, state, and local organizations, Native American tribal organizations, and/or community organizations recognized for their experience and expertise in fire prevention and safety programs and activities. Private non-profit and public organizations are also eligible.
Flood Control Projects	Through the U.S. Army Corps of Engineers, the flood control program helps reduce flood damages through projects not specifically authorized by Congress.
Flood Mitigation Assistance Program (FMA)	The Flood Mitigation Assistance program (FMA) helps States and communities identify and implement measures to reduce or eliminate the long-term risk of flood damage to homes and other structures insurable under the National Flood Insurance Program (NFIP). Projects may include: • elevation, relocation, or demolition of insured structures; • acquisition of insured structures and property; • dry flood proofing of insured structures; • minor, localized structural projects that are not fundable by State • or other Federal programs (e.g., erosion-control and drainage improvements); • beach nourishment activities such as planting of dune grass; and • State agencies, participating NFIP communities, or qualified local organizations.
Flood Plain Management Services	Through the U.S. Army Corps of Engineers, to promote appropriate recognition of flood hazards in land and water use planning and development through the provision of flood and flood plain related data, technical services, and guidance.
Florida Communities Trust (FCT)	Florida Communities Trust assists communities in protecting important natural resources, providing recreational opportunities and preserving Florida's traditional working waterfronts through the competitive criteria in the Parks and Open Space Florida Forever Grant Program and the Stan Mayfield Working Waterfronts Florida Forever Grant Program. These local land acquisition grant programs provide funding to local governments and eligible non-profit organizations to acquire land for parks, open space, greenways and projects supporting Florida's seafood harvesting and aquaculture industries.

Florida Hurricane Catastrophe Fund (FHCF)	The FHCF is a State of Florida reinsurance program that can reduce the long-term economic impacts of hurricanes by maintaining the states property insurance capacity through providing reimbursement to participating insurers for a portion of catastrophic hurricane losses Insurers that write residential property insurance on structures and their contents are required to participate and pay a premium based on their maximum hurricane exposure. Companies can select three coverage option levels - 45, 75, or 90% of covered losses above their retention. Premiums paid by participating insurers into the fund may be included in policyholder rates the same as the expense of reinsurance. Companies must demonstrate to the Office of Insurance Regulation that there is no overlap between the FHCF premium included in their rate filing and their Acat load, covering either private reinsurance or catastrophe reserves being set aside on a taxable basis.
Hazard Mitigation Grant Program (HMGP)	The HMGP program helps States and communities implement long-term hazard mitigation measures following a major disaster declaration. The program's objectives are to prevent or reduce the loss of life and property from natural hazards, to implement State or local Mitigation Strategies, to enable mitigation measures to be implemented during immediate recovery from a disaster, and to provide funding for previously identified mitigation measures that benefit the disaster area.
Land and Water Conservation Fund (LWCF) Grants	The LWCF State Assistance Program was established by the LWCF Act of 1965 (Section 6, Land and Water Conservation Fund Act of 1965, as amended; Public Law 88-578; 16 U.S.C. 4601-4 et seq.) to stimulate a nationwide action program to assist in preserving, developing, and assuring to all citizens of the United States of present and future generations such quality and quantity of outdoor recreation resources as may be available and are necessary and desirable for individual active participation. The program provides matching grants to States and through States to local units of government, for the acquisition and development of public outdoor recreation sites and facilities. Grant funds are also available, to States only, for fulfilling the statewide comprehensive outdoor recreation planning requirements of the program.
National Hurricane Program (NHP)	The National Hurricane Program (NHP) conducts assessments and provides tools and technical assistance to State and local agencies in developing hurricane evacuation plans. The program is a multi-agency partnership, involving the Federal Emergency Management Agency, the National Oceanic & Atmospheric Association, the National Weather Service, the U.S. Department of Transportation, the U.S. Army Corps of Engineers, and numerous other Federal agencies. NHP receives $5.86 million in annual funding, which consists of $2.91 million for FEMA program activities and $2.95 million for the Emergency Management Performance Grant program, which is directed into general State funds for hurricane preparedness and mitigation activities.
Nonpoint Source Implementation Grants	The 319 Program provides formula grants to the States to implement Nonpoint source projects and programs in accordance with Section 319 of the Clean Water Act. Examples of previously-funded projects include best management practices (BMPs) installation for animal waste; design and implementation of BMP systems for stream, lake, and estuary watersheds; basin-wide landowner education program; and lake projects previously funded under the CWA Section 314 Clean Lakes Program. Funding priority is to promote

	the development and implementation of watershed-based plans, focusing on watersheds with water quality impairments caused by nonpoint sources, which result in improved water quality in impaired waters.
Pollution Prevention Grants Program, Environmental Protection Agency (EPA)	This grant program provides project grants to states to implement pollution prevention projects. The grant program is focused on institutionalizing multimedia pollution (air, water, land) prevention as an environmental management priority, establishing prevention goals, providing direct technical assistance to businesses, conducting outreach, and collecting and analyzing data.
Pre-Disaster Mitigation Assistance Program (PDM)	The Pre-Disaster Mitigation (PDM) program provides funds for hazard mitigation planning and projects on an annual basis. The PDM program was put in place to reduce overall risk to people and structures, while at the same time, also reducing reliance on federal funding if an actual disaster were to occur.
Protection of Highways, Bridges, and Public Works	Through the U.S. Army Corps of Engineers, to provide protection of highways, highway bridges, essential public works, churches, hospitals, schools, and other nonprofit public services endangered by flood caused erosion.
Public Assistance (PA)	The mission of the Federal Emergency Management Agency's (FEMA) Public Assistance (PA) Grant Program is to provide assistance to State, Tribal and local governments, and certain types of Private Nonprofit organizations so that communities can quickly respond to and recover from major disasters or emergencies declared by the President. Through the PA Program, FEMA provides supplemental Federal disaster grant assistance for debris removal, emergency protective measures, and the repair, replacement, or restoration of disaster-damaged, publicly owned facilities and the facilities of certain Private Non-Profit (PNP) organizations. The PA Program also encourages protection of these damaged facilities from future events by providing assistance for hazard mitigation measures during the recovery process.
Public Works Impact Projects Program (PWIP)	To provide financial assistance in the construction of public facilities for the purpose of providing immediate useful work to unemployed and underemployed persons in the designated project areas.
Repetitive Flood Claims (RFC) Program	The Repetitive Flood Claims (RFC) grant program provides funding to reduce or eliminate the long-term risk of flood damage to structures insured under the National Flood Insurance Program (NFIP) that have had one or more claim payments for flood damages. The long-term goal of RFC is to reduce or eliminate claims under the NFIP through mitigation activities that are in the best interest of the National Flood Insurance Fund (NFIF). RFC funds may only mitigate structures that are located within a State or community that cannot meet the cost share or management capacity requirements of the Flood Mitigation Assistance (FMA) program.

Residential Construction Mitigation Program (RCMP)	The Residential Construction Mitigation Program (RCMP) is allocated $7,000,000 a year. The Mobile Home Tie-Down Program is provided 40% of this funding and 10% is provided to Florida International University for Hurricane Research. The remaining $3,500,000 is provided to eligible subgrantees for the performance of allowable activities. All projects are reviewed for eligibility and must meet cost-effectiveness requirements.
Self-Determination Act – Title III – County Funds	The Self-Determination Act (SRS Act) has recently been reauthorized and now includes specific language regarding the Firewise Communities program. Counties seeking funding under Title III must use the funds to perform work under the Firewise Communities program. Counties applying for Title III funds to implement, Firewise activities can assist in all aspects of a community's recognition process, including conducting or assisting with community assessments, helping the community create an action plan, assisting with an annual Firewise Day, assisting with local wildfire mitigation projects, and communicating with the state liaison and the national program to ensure a smooth application process. Counties that previously used Title III funds for other wildfire preparation activities such as the Fire Safe Councils or similar would be able to carry out many of the same activities as they had before.
Severe Repetitive Loss Program (SRL)	The Severe Repetitive Loss (SRL) grant program was designed to provide funding to reduce or eliminate the long-term risk of flood damage to severe repetitive loss (SRL) structures insured under the NFIP. SRL Properties are residential properties: • That have at least four NFIP claim payments over $5,000 each, when at least two such claims have occurred within any ten-year period, and the cumulative amount of such claims payments exceeds $20,000; or • For which at least two separate claims payments have been made with the cumulative amount of the building portion of such claims exceeding the value of the property, when two such claims have occurred within any ten-year period. Residential projects include: • Acquisition and demolition or relocation • Elevation and retrofit • Mitigation reconstruction • Dry flood-proofing of historical structures • Minor physical flood control projects The Federal/Non-Federal cost share is 75/25 % with up to 90% Federal cost-share funding for projects approved in states, territories, and federally-recognized Indian tribes with FEMA-approved Standard or Enhanced Mitigation Plans or Indian tribal plans that include a strategy for mitigating existing and future SRL properties. Florida is an Enhanced Plan state and so receives 90% Federal cost-share.
Small County Road Assistance Program (SCRAP)	The purpose of this program is to assist small county governments in resurfacing and reconstructing county roads. In determining a county's eligibility for assistance under this program, the department may consider whether the county has attempted to keep county

	roads in satisfactory condition, including the amount of local option fuel tax imposed by the county. The department may also consider the extent to which the county has offered to provide a match of local funds with state funds provided under the program.
Small County Outreach Program (SCOP)	The purpose of this program is to assist small county governments in repairing or rehabilitating county bridges, paving unpaved roads, addressing road-related drainage improvements, resurfacing or reconstructing county roads, constructing capacity or safety improvements to county roads. Small counties shall be eligible to compete for funds that have been designated for the Small County Outreach Program for projects on county roads. The Department shall fund 75% of the cost of projects on county roads funded under the program. Any initial bid costs or project overruns after the letting that exceed the Department's participation as stated, will be at the county's expense. This will help ensure that the funds are utilized on as many projects as possible. The county must have a population of 150,000 or less as determined by the most recent official estimate pursuant to Section 186.901, Florida Statutes. The county has attempted to keep county roads in satisfactory condition, which may be evidenced through an established pavement management plan. The county must provide 25% of the project costs and may be in the form of matching local funds (i.e., in-kind services). Such matching funds will be deducted from the project costs as part of the county's contribution.
Special Economic Development and Adjustment Assistance Program-Sudden and Severe Economic Dislocation (SSED) and Long Term Economic Deterioration (LTED)	The Economic Adjustment Program Grants assist State and local areas in the development and/or implementation of strategies designed to address structural economic adjustment problems resulting from sudden and severe economic dislocation (SSED) such as plant closings, military base closures and defense contract cutbacks, and natural disasters, or from long-term economic deterioration (LTED) in the area's economy. Grants may be made to develop an Economic Adjustment Strategy Grant, or to implement such strategies. Implementation grants may be made for the construction of public facilities, business development and financing (including revolving loan funds), technical assistance, training or any other activity that addresses the economic adjustment problem.
State Homeland Security Program (SHSP)	SHSP supports the implementation of state Homeland Security Strategies to address the identified planning, organization, equipment, training, and exercise needs to prevent, protect against, mitigate, respond to, and recover from acts of terrorism and other catastrophic events. SHSP also provides funding to implement initiatives in the State Preparedness Report. The State Administrative Agency (SAA) is the only entity eligible to apply to FEMA for SHSP funds. The allocation methodology for FY 2012 SHSP is based on three factors: minimum amounts as legislatively mandated, DHS' risk methodology, and anticipated effectiveness based on the strength of the Investment Justification (IJ). Each State and territory will receive a minimum allocation under SHSP using the thresholds established in the 9/11 Act. All 50 States and Puerto Rico will receive 0.35 percent of the total funds allocated for grants under Section 2003 and Section 2004 of the Homeland Security Act of 2002, as amended by the 9/11 Act, for SHSP.
Transportation Equity Act for the 21st Century, Surface Transportation	The Surface Transportation Program (STP) funds may be used by State and local governments for any roads (including the National Highway System) that are not functionally classified as local or rural minor collectors. Each State sets aside 10% of STP funds for transportation enhancements, which can include water-related projects, such as

Program (STP)	wetland mitigation and implementation of control technologies to prevent polluted highway runoff from reaching surface water bodies. Other transportation enhancements include landscaping and other scenic beautification, pedestrian and bicycle trails, archaeological planning and research, preservation of abandoned railway corridors, historic preservation, sidewalk modifications to comply with Americans with Disabilities Act, natural habitat or wetland mitigation efforts, Intelligent Transportation System (ITS) capital improvements and environmental and pollution abatement projects.
Water and Waste Disposal Loans and Grants	This program provides water and waste disposal facilities and services to low income rural communities whose residents face significant health risks. Funds may be used for 100% construction costs to construct, enlarge, extend, or otherwise improve a community water or sewer system; extend service lines and connect individual residences to a system. The program allows applicants to make grants directly to individuals to extend service lines, connect resident's plumbing to system, pay reasonable charges and fees for connecting to system, installation of plumbing and related fixtures, and construction in dwelling of a bathroom.
Water Pollution Control Program Grants	Section 106 of the Clean Water Act authorizes EPA to provide federal assistance to states and interstate agencies to establish and implement ongoing water pollution control programs. Prevention and control measures supported by pollution control programs include permitting, development of water quality standards and total maximum daily loads, surveillance, ambient water quality monitoring, and enforcement; advice and assistance to local agencies; and the provision of training and public information. Increasingly, EPA and states are working together to develop basin-wide approaches to water quality management. The Water Pollution Control Program is helping to foster a watershed protection approach at the state level by looking at states' water quality problems holistically and targeting the use of limited finances available for effective program management.
Watershed Protection and Flood Prevention (WFPO)	The Watershed and Flood Prevention Operations (WFPO) Program (Watershed Operations) includes the Flood Prevention Operations Program authorized by the Flood Control Act of 1944 (P.L. 78-534) and the provisions of the Watershed Protection and Flood Prevention Act of 1954 (P.L. 83-566). The Flood Control Act originally authorizes the Secretary of Agriculture to install watershed improvement measures in 11 watersheds, also known as pilot watersheds, to reduce flood, sedimentation, and erosion damage; improve the conservation, development, utilization, and disposal of water; and advance the conservation and proper utilization of land. The Watershed Protection and Flood Prevention Act provides for cooperation between the Federal government and the States and their political subdivisions in a program to prevent erosion, floodwater, and sediment damage; to further the conservation, development, utilization, and disposal of water; and to further the conservation and proper utilization of land in authorized watersheds. The Watershed and Flood Prevention Operations (WFPO) Program provides technical and financial assistance to States, local governments and Tribes (project sponsors) to plan and implement authorized watershed project plans.

Wildland Urban Interface Community and Rural Fire Assistance, Program 15.228	This program is designed to implement the National Fire Plan and assist communities at risk from catastrophic wildland fires. The program provides grants, technical assistance, and training for community programs that develop local capability, including: assessment and planning, mitigation activities, and community and homeowner education and action; Hazardous fuels reduction activities, including the training, monitoring or maintenance associated with such hazardous fuels reduction activities, on federal land, or on adjacent nonfederal land for activities that mitigate the threat of catastrophic fire to communities and natural resources in high risk areas. Enhancement of knowledge and fire protection capability of rural fire districts through assistance in education and training, protective clothing and equipment purchase, and mitigation methods on a cost share basis.

Administration of Mitigation Projects, Initiatives or Actions

It is anticipated that the County, the City of Lake Butler and the Town(s) of Worthington Springs and Raiford with regards to any mitigation project(s) that are included in the LMS, will apply for and administer grants for actions within their respective jurisdictions. The following lists of agencies are responsible for carrying out the identified mitigation projects (if applicable) that are contained in the LMS as well as the functions they provide.

Union County Emergency Management
The Union County Department of Emergency Management is the lead agency responsible to develop and maintain the LMS Plan. This includes annual and 5-year updates and continual maintenance of the LMS mitigation project list. The office is also responsible for managing and overseeing all details for the communities to prepare for, respond to, recover from and mitigate against natural, technological and man-made hazards. The Emergency Management Director is responsible for implementing and administrating the mitigation projects, including researching and identifying funding sources and providing timeframes for the completion of the project.

County Building Department and Lake Butler Planning and Zoning Department
Identify, develop and recommend changes to the building and zoning codes that will eliminate or lessen the impact of disasters. Assure enforcement of all existing building and land development regulations. The Building Inspector is responsible for implementing and administrating the mitigation project, including researching and identifying funding sources and providing timeframes for the completion of the project.

County Volunteer Fire Department
Identify and recommend mitigation goals that will reduce and/or lessen the impact of wildfires within their jurisdiction. Provide education and training that will assist in accomplishing the mitigation goals and objectives. The Fire Chief will take the lead in implementing and administrating the mitigation project, including researching and identifying funding sources and providing timeframes for the completion of the project

County Road Department and Lake Butler Public Works Department
Provide technical assistance and advice on identifying and accomplishing mitigation actions to improve the design, construction and placement of roads, bridges, culverts, etc., that will eliminate or lessen the impact of disasters. The Road Department Director and the Public Works Director are responsible for implementing and administrating the mitigation project, including researching and identifying funding sources and providing timeframes for the completion of the project.

County School Board
The Board is responsible for construction and maintenance of public schools used as emergency shelters. The School Board will be responsible for implementation of mitigation actions proposed for public school buildings. The School

Board Superintendent is responsible for implementing and administrating the mitigation project, including researching and identifying funding sources and providing timeframes for the completion of the project.

Union County Health Department
Identify and recommend mitigation goals that will reduce and/or lessen the impact for the county residents health and safety within their jurisdiction. Provide education and training that will assist in accomplishing the mitigation goals and objectives. The Health Department Representative will take the lead in implementing and administrating the mitigation project, including researching and identifying funding sources and providing timeframes for the completion of the project.

Florida Forest Service
Provide technical assistance and advice on all aspects of wildfire issues including identification and accomplishment of mitigation actions designed to reduce the loss of life and real property. The Wildfire Mitigation Specialist is responsible for implementing and administrating the mitigation project, including researching and identifying funding sources and providing timeframes for the completion of the project.

Florida Department of Transportation (FDOT)
Provide technical assistance and advice on identifying and accomplishing mitigation actions to improve the design, construction and placement of roads, bridges, culverts, etc., that will eliminate or lessen the impact of disasters. The FDOT District Two Representative for the area is responsible for implementing and administrating the mitigation project, including researching and identifying funding sources and providing timeframes for the completion of the project.

Florida Division of Emergency Management (FDEM)
Provide technical assistance and funding when available; in all aspects of emergency management in order to better able the county to prepare for, respond to, recover from, and mitigate against natural, technological and man-made hazards.

Suwannee River Water Management District (SRWMD)
Provide technical assistance and advice on identifying and accomplishing mitigation actions to help reduce or eliminate the impact of flooding in the County. The SRWMD Representative is responsible for implementing and administrating the mitigation project, including researching and identifying funding sources and providing timeframes for the completion of the project.

Section 6 – Plan Evaluation and Maintenance

Requirements:

§201.6(c)(4)(i): The plan maintenance process shall include a section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

§201.6(c)(4)(ii): The plan shall include a process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.

§201.6(c)(4)(iii): The plan maintenance process shall include a discussion on how the community will continue public participation in the plan maintenance process.

§201.6(d)(3): Was the plan revised to reflect changes in development?

Changes In Development

The Union County Local Mitigation Strategy (LMS) is a living document that must continually reflect the changing needs of the communities as the county experiences growth and changes in relation to hazard vulnerability. Changes in land use and development can affect a variety of infrastructure issues such as potable water, sewer, roads, storm water runoff patterns and ecological considerations such as water quality. Significant natural hazard events can alter hazard prone areas.

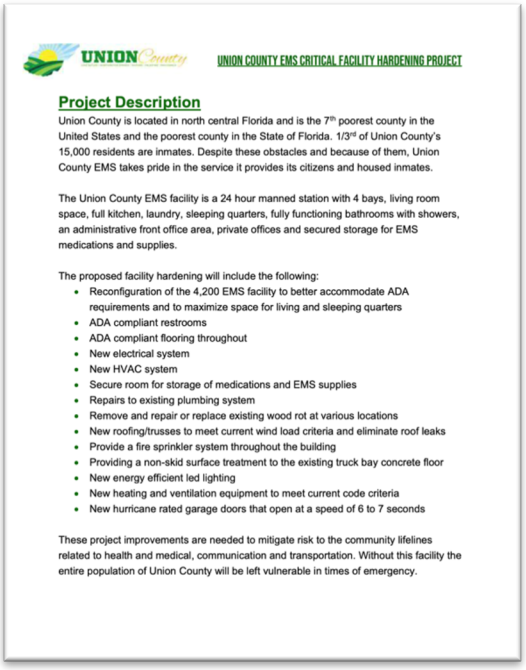
There have been some significant changes in development in Union County since the last LMS plan was approved.

UF Extension Union County Extension Office

A new indoor/outdoor agricultural education and regional training center was completed. It hosts the UF Extension staff and will also be utilized as a Point of Distribution (POD) center to provide a more efficient staging and logistics area for the County residents after a storm event. In addition, the facility offers a location for training for first responders, emergency personnel, volunteers, and County residents.

Significant Projects to be completed within the next five years (2021 – 2026):

Union County EMS Critical Facility Hardening Project



UNION County UNION COUNTY EMS CRITICAL FACILITY HARDENING PROJECT

Project Description

Union County is located in north central Florida and is the 7th poorest county in the United States and the poorest county in the State of Florida. 1/3rd of Union County's 15,000 residents are inmates. Despite these obstacles and because of them, Union County EMS takes pride in the service it provides its citizens and housed inmates.

The Union County EMS facility is a 24 hour manned station with 4 bays, living room space, full kitchen, laundry, sleeping quarters, fully functioning bathrooms with showers, an administrative front office area, private offices and secured storage for EMS medications and supplies.

The proposed facility hardening will include the following:

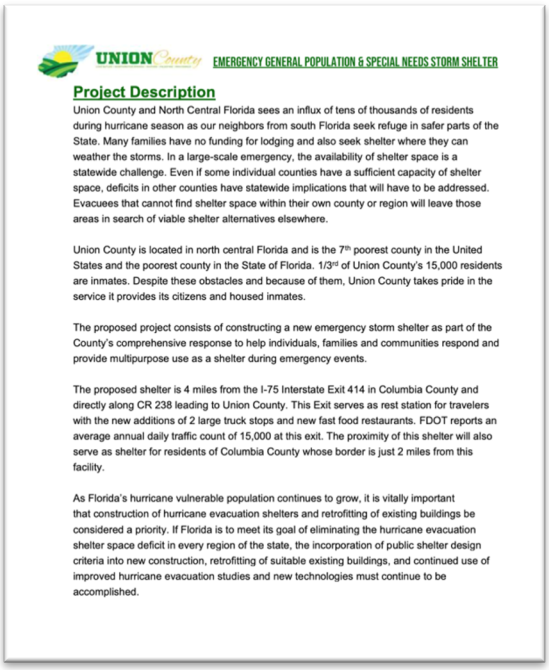
- Reconfiguration of the 4,200 EMS facility to better accommodate ADA requirements and to maximize space for living and sleeping quarters
- ADA compliant restrooms
- ADA compliant flooring throughout
- New electrical system
- New HVAC system
- Secure room for storage of medications and EMS supplies
- Repairs to existing plumbing system
- Remove and repair or replace existing wood rot at various locations
- New roofing/trusses to meet current wind load criteria and eliminate roof leaks
- Provide a fire sprinkler system throughout the building
- Providing a non-skid surface treatment to the existing truck bay concrete floor
- New energy efficient led lighting
- New heating and ventilation equipment to meet current code criteria
- New hurricane rated garage doors that open at a speed of 6 to 7 seconds

These project improvements are needed to mitigate risk to the community lifelines related to health and medical, communication and transportation. Without this facility the entire population of Union County will be left vulnerable in times of emergency.

The hardening of the EMS facility is essential to mitigate risk to the community lifelines related to health and medical, communication and transportation. This facility is essential in times of emergency especially during and after a natural hazard event. The approximate cost for this project is: $853,125.00

Emergency General Population and Special Needs Storm Shelter

Construct a new emergency storm shelter as part of the County's comprehensive response to help individuals, families, and communities respond and provide for a multipurpose use as a shelter during emergency hazard events, especially during and after a natural hazard event like a hurricane or significant tropical storm occurrence. The approximate cost for this project is: $1,590,300.00



UNION County EMERGENCY GENERAL POPULATION & SPECIAL NEEDS STORM SHELTER

Project Description

Union County and North Central Florida sees an influx of tens of thousands of residents during hurricane season as our neighbors from south Florida seek refuge in safer parts of the State. Many families have no funding for lodging and also seek shelter where they can weather the storms. In a large-scale emergency, the availability of shelter space is a statewide challenge. Even if some individual counties have a sufficient capacity of shelter space, deficits in other counties have statewide implications that will have to be addressed. Evacuees that cannot find shelter space within their own county or region will leave those areas in search of viable shelter alternatives elsewhere.

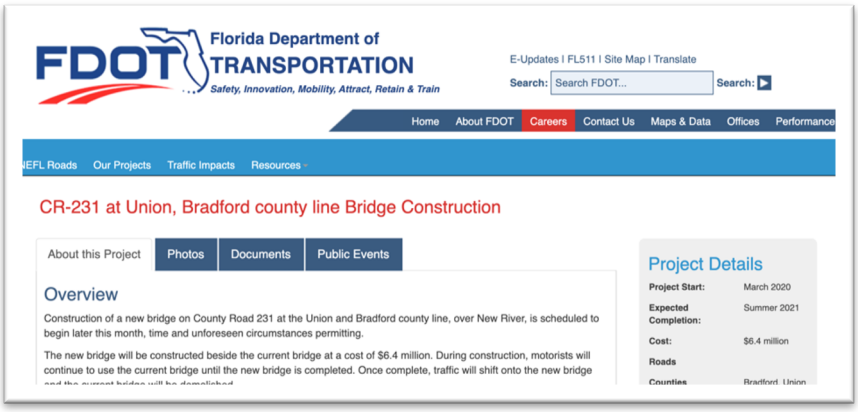
Union County is located in north central Florida and is the 7th poorest county in the United States and the poorest county in the State of Florida. 1/3rd of Union County's 15,000 residents are inmates. Despite these obstacles and because of them, Union County takes pride in the service it provides its citizens and housed inmates.

The proposed project consists of constructing a new emergency storm shelter as part of the County's comprehensive response to help individuals, families and communities respond and provide multipurpose use as a shelter during emergency events.

The proposed shelter is 4 miles from the I-75 Interstate Exit 414 in Columbia County and directly along CR 238 leading to Union County. This Exit serves as rest station for travelers with the new additions of 2 large truck stops and new fast food restaurants. FDOT reports an average annual daily traffic count of 15,000 at this exit. The proximity of this shelter will also serve as shelter for residents of Columbia County whose border is just 2 miles from this facility.

As Florida's hurricane vulnerable population continues to grow, it is vitally important that construction of hurricane evacuation shelters and retrofitting of existing buildings be considered a priority. If Florida is to meet its goal of eliminating the hurricane evacuation shelter space deficit in every region of the state, the incorporation of public shelter design criteria into new construction, retrofitting of suitable existing buildings, and continued use of improved hurricane evacuation studies and new technologies must continue to be accomplished.

Construction of a New Bridge



A new bridge on CR 231 at the Union and Bradford county line, over the New River, will be constructed with an estimated cost of $6,400,000. Status: This bridge is currently under construction.

Flood Mitigation Drainage Improvement Project

CR18 to SR121 to the Columbia County line, a significant drainage improvement project with an estimated cost: $5,000,000

Build a New Fire Station

Construct a new fire station in the unincorporated area of Union County. The land has been purchased and currently awaiting funding. This new structure will provide fire protection and assist in all hazards mitigation, especially the mitigation of wildfires.

Summary on Changes in Development

Union County is the smallest county by area in Florida. Over the last 10 years (2010 – 2019) there has been a decrease in population (-0.2%) for each jurisdiction and projections over the next five years have only a very slight increase in total population for the entire County. There hasn't been any large-scale housing or industrial developments in the last five years. The mitigation projects projected for the next five years would be significant in terms of mitigation efforts for the County and its citizens if they are able to complete them. NOTE: It is important to state that some of these important mitigation projects projected to be completed in the next five years will depend on the grant funding available.

The changes in development that have occurred (2016 – 2019) or will occur over the next five years will **decrease the vulnerability from the following hazard events**:

- ✓ flooding events with the significant drainage of project and construction of a new bridge;
- ✓ hardening of the EMS facility is essential to mitigate risk to the community lifelines related to health and medical, communication and transportation;
- ✓ construction of a new emergency storm shelter as part of the County's comprehensive response to help individuals, families, and communities respond and provide for a multipurpose use as a shelter during emergency hazard events, especially during and after a natural hazard event like a hurricane or significant tropical storm occurrence; and
- ✓ constructing a new fire station will assist in all hazards mitigation, especially the mitigation of wildfires.

Table 6.1 are the mitigation initiatives or projects that have been completed over the last several years. Detailed specifics on the agency responsible for implementation, the estimated total cost for the project, the funding source, and timeframe for project completion are located in Appendix B, the Union County Local Mitigation Strategy Project Master List.

Table 6.1 – Mitigation Projects Completed (2016 – 2020)

LMS Mitigation Projects or Initiatives for Union County Scope of Work	Hazards Mitigated
Installation of a 60 kW generator for Fire Station 6.	All Hazards
Installation of a 60kW generator for the EMS Headquarters.	All Hazards
Established a mosquito control program. This program will also be ongoing.	All Hazards
Retrofitted the school to add additional shelter space.	All Hazards
Road drainage mitigation projects completed over the last 5 years - Small County Outreach Program (SCOP) and Small County Road Assistance Program (SCRAP): ✓ SCOP CR 239 to NW 137th Street ✓ SCOP CR 241 Bridge repair of Croft Street Bridge over Olustee Creek ✓ SCRAP SW 63rd Drive from CR18A to CR231A ✓ SCRAP CR 199 to SR16 to CR125 ✓ SCRAP NE 233 Lane/Sapp Cemetery from CR229 to SR121 ✓ SCRAP SE 8th Ave from SR121 to SR100	Floods

Deleted Mitigation Projects

Over the last 5 years, the LMS Working Group have analyzed specific mitigation projects that were considered not applicable to the strategy of the LMS and after careful discussion by the group, the projects were deleted from the LMS project or initiative list. The deleted projects are noted in Appendix B.

LMS Plan Evaluation, Maintenance and Update

The Union County Emergency Management Director in conjunction with the Union County LMS Working Group coordinates the following process for monitoring, evaluating, and revising the LMS Plan over the five year period.

The Union County EM Director will be responsible for monitoring the LMS plan. This includes technical and clerical support for the benefit of the LMS Working Group. The Director will monitor the status of the mitigation projects throughout the year and hazard events that have occurred within the County. If a significant event occurs in Union County, for which a LMS-supported project may be eligible for grant funding, a special meeting the LMS Working Group

will be called by the Chair. In addition, the goals and objectives will be evaluated and analyzed to confirm that they are meeting the needs of the County. If there are any required changes needed for the LMS Plan, the discussion will occur at the annual meeting with the Working Group.

Every year at the annual LMS meeting, the LMS Working Group will meet and if necessary on a biannual timeframe to discuss the LMS plan's effectiveness on the following topics:

- Changes to the hazard risk or vulnerability;
- Discuss each mitigation project and update the status:
  - ✓ if any mitigation project has been completed - provide as much detail as possible on the project, the hazard mitigated, the cost, and timeframe to complete the project,
  - ✓ if any project needs to be removed or deleted, or
  - ✓ if there are new mitigation projects or initiatives to added to the master list.
- Review the mitigation goals and objectives to confirm that they are meeting the county's needs;
- Discuss any revision to applicable maps;
- Evaluate the repetitive loss properties data; and
- Changes to the County's critical facilities list.

As a result of these efforts, any significant changes as well as information required in accordance with Florida Statute Chapter 27P-22 will be submitted to the Florida Division of Emergency Management, Mitigation Planning Section within the timeframe outlined in the statute, which is in January.

If in the event a disaster should occur, or other type of emergency in the County, the Working Group may choose to meet early in the recovery and then redevelopment phase, soon after damage assessments are conducted. At this point, the current strategy will be reviewed and necessary changes made based on lessons learned from the response and recovery phase of the disaster. Also, new mitigation projects might be identified as a result of the disaster event and will be considered and added to the mitigation project list if deemed viable.

The Working Group will begin the 5-year update process as close to the 18-months prior to the expiration of the LMS Plan. The plan update will be based on an evaluation and analysis of the risk and vulnerability assessment. The intent is to incorporate any changes in the estimate of replacement costs, new scientific data on hazards, the effects hazards have on the communities, changes in growth patterns, and if there are any reductions in vulnerability due to completion of mitigation projects.

Once the risk assessment is updated, the Working Group will utilize this information and evaluate the goals, objectives, and actions contained in the LMS to determine if they are still applicable.

In addition, the Working Group will evaluate whether or not the communities have the resources available to implement current and new programs and projects. The updated LMS will also capture the planning process followed during the update of the Plan.

During the 5-year LMS evaluation and revision process, *one or more public meetings* will be conducted and include elected and appointed County officials, each participating municipality, and the general public, for consideration of the proposed comments or changes. The updated LMS plan will become available online at the County EM website to give the public an opportunity to review the document prior to the final plan approval.

Continued Public Involvement

Educating the County citizens on mitigation is an important issue for Union County Emergency Management Department with these continued and ongoing projects.

- ✓ Union County Sheriff's Office Facebook

Union County Emergency Management (EM) utilizes the Sheriff's Office Facebook page to communicate all EM activities necessary to build, sustain, and improve the capability to mitigate against, prepare for, respond to, and recover from natural or man-made disasters.

The social media account is very active with over 2,000 shares from the County citizens and is the preferred mechanism for communication.

https://www.facebook.com/pg/unionsheriff/photos/?ref=page_internal

✓ Emergency Management conducts disaster safety presentations throughout the year at local organizations, small associations and groups, churches, and local schools.

✓ The Union County Assistant EM Director/Fire Captain and the EM Director/Fire Director work with the Florida Forest Service in providing an outreach program for the county citizens on Firewise; defensible space, hazardous fuel reduction and fire adaption.

- ✓ Smokey Bear actively visits the schools in Union County to promote wildfire safety and the benefits of fire prevention.
- ✓ Florida Forest Service distribute forestry information at the Back to Raiford Day.
- ✓ First Responders provide materials through an outreach booth at the Union County 4th of July Celebration and the Bradford/Union County Fair in March every year.

- ✓ Mitigation materials are disseminated at the community parades, schools, the women's club, the grocery stores, other county departments, including the BOCC office and the building department.
- ✓ Union County Emergency Management frequently conducts career days discussing all phases of Emergency Management.
- ✓ The Florida Forest Service distribute materials at the Union County schools during the career days.
- ✓ The Assistant EM Director/Fire Captain performs inspections and briefings for the public at kids events that involve public safety at the library and prison.
- ✓ Annually, the storm spotters program, instruct a class for the County Citizens on improving warning services for hailstorms, wind damage, lightning, flash flooding, heavy rain, and tornado events.

The Union County LMS Working Group held scheduled meetings throughout the 5-year mitigation planning process cycle. All meetings will be public meetings as required by Article I, 24 (b) of the Florida Constitution and any exceptions to this law would have to be duly noted. There was an opportunity at every meeting for the public citizens to provide comment on the Local Mitigation Strategy and planning process for updating the LMS.

A legal notice of all County LMS meetings is advertised on the online websites and in the following printed newspapers prior to each meeting inviting the public to attend and participate. There were several opportunities to include the public citizens in the LMS planning. All LMS meeting notices were announced at the:

- ✓ Union County website (under the county commission message board for the upcoming meetings):

https://unioncounty-fl.gov/advertisements-notices-and-rfps/

- ✓ Union County Sheriff's Office Facebook:

https://www.facebook.com/unionsheriff/

The LMS Working Group provided an alternative method for those interested in the County mitigation efforts and are unable to attend the LMS meetings.

Public Involvement in the Drafting Stage of the LMS

Public involvement with the LMS is important to document. A copy of the 2020 LMS plan was available at the Union County Emergency Management office via plan download link. It provided the County citizens an opportunity to review the document and submit feedback to the EM director "prior to the final plan approval". An advertisement was placed on the Union County Board of County Commissioners website: https://unioncounty-fl.gov/advertisements-notices-and-rfps/:

The county citizens were encouraged to submit their comments and provide feedback to the Emergency Management Director, Tim Allen, allentc@unionsheriff.us by the close of business day on the 13th. The commentary was considered before the final draft of the LMS Plan is presented to the State. There was some feedback from the LMS Working Group on Section 4, Hazard Risk & Vulnerability Assessment. Updates were included in this final LMS Plan.

After approval by the County LMS Working Group, the revised plan and appropriate crosswalk will be submitted to the State for review and final approval.

Upon receiving an "approved pending adoption" letter from the State of Florida, the Working Group will present the updated plan to the County Commission as well as the Commissions or Councils of the City of Lake Butler, the Town of Raiford, and the Town of Worthington Springs for approval and adoption. At least one jurisdiction must adopt the updated plan within one year of receiving "approved pending adoption" letter in order to receive a final approval. All other jurisdictions must adopt the updated plan in order to be eligible for federal mitigation grant funds.