Columbia County

Local Mitigation Strategy
2015

Overview

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 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.

Columbia County is threatened by a number of different types of natural hazards (i.e. flooding, sinkholes, wildfires, tornadoes, thunderstorm/wind , drought/heat wave, erosion/riverine erosion, etc.). These hazards endanger the health and safety of the population of the county, jeopardizing its economic vitality, and imperil the quality of its environment.

The importance of avoiding or minimizing the vulnerabilities to these hazards, the county's public and private sector interests established the Local Mitigation Strategy (LMS) Committee/Workgroup to develop a comprehensive planning process, risk assessment, and a strategy to mitigate with specific projects that are based on a sound planning process that account for the inherent risk and capabilities of the county's communities.

Extensive research and analysis has been performed to identify the hazards threatening the jurisdictions of Lake City, Fort White and unincorporated Columbia County to estimate the relative risks posed to the community by those hazards.

This study has been used by the Committee/Workgroup Members to assess the vulnerabilities of the facilities and jurisdictions of Columbia County to the impacts of future disasters involving those hazards. With these identified, the Committee has worked to identify proposed mitigation projects that will avoid or minimize these vulnerabilities and to make the communities of Columbia County much more resistant to the impacts of future disasters.

The proposed projects are aimed at reducing the impacts of future disasters and have been developed and will continue to be evaluated by the Committee/Workgroup 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, Columbia County will become a more "disaster resistant" community.

This document details the work of the Columbia County LMS Committee over the past several years to develop the planning organization, to undertake the needed technical analyses, and to coordinate the mitigation projects that have been proposed by the participating jurisdictions and organizations.

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 City, the Town of Fort White, and unincorporated Columbia County. Adoption of the Columbia County LMS by the City and County Commissions will not have any legal affect 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 Committee/Workgroup continues to solicit the involvement of the entire community to make the people, neighborhoods, businesses, and institutions of Columbia County safer from the impacts of disaster events.

Note: Throughout the LMS plan, reference to the LMS Committee or Workgroup will be either, or both, and the LMS mitigation projects could be projects, actions or initiatives.

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

Section 1	Introduction identifies the purpose and context for the plan.
Section 2	Planning Process provides the details 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.
Section 3	Geography, demographics, and current and future Land Use, which are important elements in the mitigation planning.
Section 4	Hazard Risk and Vulnerability Assessment defines the type, probability, location, vulnerability, impact and extent of the natural hazards that affect the county and its' municipalities. Data and statistics on previous occurrences of hazard events are described. The type and number of repetitive loss properties are noted for each jurisdiction.
Section 5	Mitigation Strategy provides the blueprint for reducing the potential losses identified in the risk assessment, which are based on existing authorities, policies, programs, and resources, and its ability to expand on and improve these existing tools. The areas in this section will consist of the LMS goals, analysis of the mitigation projects, the National Flood Insurance Program (NFIP) and compliance and implementation of the mitigation projects.
Section 6	Plan Evaluation and Maintenance will discuss the changes in development, the method and schedule of monitoring, evaluating and updating the plan. It will examine other planning mechanisms, and public participation in the plan maintenance process.
Appendix I	The LMS meeting documentation over the last five years (i.e. the meeting advertisement or public notice, the agenda, the sign-in sheets, and the meeting minutes).
Appendix II	The Columbia County Community Wildfire Protection Plan.
Appendix III	The Repetitive Loss and a Special Flood Hazard Map with Conservation Land for the County.
Appendix IV	Article on Roads and Neighborhoods in Columbia County Prone to Flooding.
Appendix V	Article 8 from the County Land Development Regulations.
Appendix VI	Flood Mitigation Outreach Material for the County Residents.
Attachment I (Excel format)	The Local Mitigation Strategy Projects or Initiatives Master List (includes three lists): 1. Current list of the new, ongoing or deferred mitigation projects 2. Completed list of mitigation projects 3. Deleted or removed list of mitigation projects

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Section 1 - Introduction

As stated by FEMA…."Mitigation is valuable to society in these ways:

- ✓ It creates safer communities by reducing loss of life and property damage. For example, the rigorous building standards adopted by 20,000 communities across the country are saving the nation more than $1.1 billion a year in prevented flood damages.
- ✓ It allows individuals to minimize post-flood disaster disruptions and recover more rapidly. For example, homes built to National Flood Insurance Program (NFIP) standards incur less damage from floods. When floods cause damage, flood insurance protects the homeowner's investment, as it did for the more than 200,000 Gulf Coast residents who received more than $23 billion in payments following the 2005 hurricanes.
- ✓ It lessens the financial impact on individuals, communities and society as a whole. For example, a recent study by the Multi-hazard Mitigation Council shows that each dollar spent on mitigation saves society an average of four dollars."

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 projects 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 might include land use planning techniques that limit infrastructure in high hazard areas, programs for retrofitting existing structures to meet new building codes and standards and the acquisition of structures that are in a high hazard area. Ideally, a community can minimize the effects of future hazards through a mix of code enforcement, planning, and responsible development.

Disasters can Cost the Community and Local Government

Hazards have real costs to businesses and residents. Businesses in high hazard areas can suffer when damaged or isolated by storms. Residents, who build in flood prone areas are subject to evacuation, damage to their homes, lower home values, and higher insurance premiums.

Critical facilities such as hospitals, medical centers, schools, airports, water treatment plants, water wells, lift stations, radio communications towers, correctional institutions, utilities and major government buildings 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 of course, community health and safety are beyond price.

Community infrastructure such as 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.

Purpose

The purpose of developing a Local Mitigation Strategy (LMS) is to establish an ongoing process that will make hazard mitigation part of the daily functioning life in Columbia 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, and relevant codes and ordinances for effective floodplain management.

Over the last 20+ 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.

Changes in Federal laws have resulted in pre-disaster mitigation project funding and mitigation planning requirements. Consequently, on October 30, 2000 amending the Robert T. Stafford Relief and Emergency Assistance Act, The Disaster Mitigation Act of 2000 (DMA 2000) was signed into law. It states that if States and local governments do not have approved multi-hazard mitigation plans in place and a disaster occurs, they will not be entitled to Public Assistance and other FEMA funding.

Details from DMA 2000 to local governments:

- The Act established a requirement for local governments to have a FEMA-approved hazard mitigation plan in order to be eligible for funding from FEMA through Pre and Post-Disaster grant programs such as Pre-Disaster Mitigation Assistance (PDM) or the Hazard Mitigation Grant Program (HMGP).
- All natural hazards that affect the county will need to be addressed in the risk and vulnerability assessment section of the Hazard Mitigation Plan.
- The Act establishes November 1, 2004 as the date by which local governments and tribal organizations were required to prepare and adopt their respective plans in order to be eligible for FEMA Hazard Mitigation Assistance. In addition, local jurisdictions must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within 5 years from date of FEMA approval to remain eligible for the mitigation project grant funding.

This plan encompasses the most recent process of reviewing and revising the Columbia County LMS in accordance with the DMA 2000. The main goal of the local mitigation strategy is to identify and assess the risk and vulnerability to various natural disasters the County and its municipalities face, and then develop local strategies to reduce the impact of future disasters. This plan is a continuation of the 2005 efforts and is the product of the 2nd 5-year revision and update process.

The Columbia County Framework

The Columbia County LMS Committee/Workgroup was established to make the population, neighborhoods, businesses and institutions of the community more resistant to the impacts of future disasters. This dedicated committee/workgroup has been undertaking a comprehensive, detailed evaluation of the vulnerabilities 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 Columbia County LMS is intended by the Committee/Workgroup to serve many purposes. These include the following:

✓ *The Approach to Mitigation Planning*

The approach utilized by the Columbia County LMS Committee/Workgroup relies on a step-wise application of structured planning concepts in a methodical process to identify vulnerabilities to future disasters and to propose the mitigation projects necessary to avoid or minimize those vulnerabilities*. 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.

✓ *Enhance Public Awareness and Safety*

The Committee/Workgroup continues to 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. The plan identifies the hazards threatening Columbia County and provides an assessment of the relative level of risk they pose.

It also details the specific vulnerabilities of the neighborhoods of Columbia County and many of the facilities that are important to the community's daily life.

The Committee/Workgroup 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.

Note: The Columbia County Department of Emergency Management has an active Facebook page to connect with the community residents:

https://www.facebook.com/pages/Columbia-County-Florida-Emergency-Management/353463268093780

✓ *Create a Decision Tool for Management*

The Columbia County LMS provides 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 projects 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 prioritized for implementation using ten objective criteria. This approach 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.

✓ *Enhance Local Policies for Hazard Mitigation Capability*

A component of the hazard mitigation planning process conducted by the Columbia County LMS

Committee/Workgroup is the analysis of the existing policy, program and regulatory basis for control of growth and development. This process involves cataloging the current mitigation-related policies of local government so that they can be compared with the hazards that threaten the jurisdiction and the relative risks they pose to the community. When the risks posed to the community by a specific hazard are not adequately addressed in the community's policy or regulatory framework, the impacts of future disasters can be even more severe.

The planning process utilized supports a detailed comparison of the community's policy controls to the level of risk posed by specific hazards. This comparison supports and justifies efforts to propose enhancements in the policy basis for could or should be promulgated by the involved local jurisdictions to create a more disaster-resistant future for the community.

✓ *Coordination for the Mitigation Projects*

A key purpose of the planning process utilized by the Columbia County Committee is to ensure that proposals for mitigation projects are reviewed and coordinated among the participating jurisdictions within the County.

Each mitigation project proposed by one jurisdiction or participating organization, when implemented, will be compatible with the interests of adjacent jurisdictions and unlikely to duplicate or interfere with mitigation projects proposed by others.

✓ *Jurisdiction-Specific Mitigation Strategies for Implementation*

A key goal for the Columbia County LMS is to provide each participating local jurisdiction with a specific plan of action that can be adopted and implemented pursuant to its own authorities and responsibilities.

Therefore, the plan addresses mitigation projects for each participating jurisdiction. 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*

The planning process used by the LMS Committee/Workgroup meets the analysis and documentation needs of the planning process. The plan utilizes a full range of information in the technical analysis and the formulation of proposed mitigation projects for incorporation into this plan.

The following sections of the Columbia County LMS present the detailed information to support these purposes. The remainder of the plan describes the planning organization developed by the Committee, as well as its approach to managing the planning process. It then summarizes the results of the hazard identification and vulnerability assessment process, and addresses the current policy basis for hazard management by the participating jurisdictions and organizations.

The plan also documents the structural and non-structural mitigation projects proposed by the participating jurisdictions to address the identified vulnerabilities. The plan concludes by addressing the goals and objectives of the Committee 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.

§201.6 (c) (4)(i) - A section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

The Columbia County LMS is a local community product, which was developed by the LMS Committee/Workgroup in 2005 and 2010 to be in compliance with the DMA 2000 requirements, and currently in 2015 for the 5-year required update.

The Columbia County Department of Emergency Management initiated the LMS planning process by hiring consultants to author the updated LMS plan. Facilitated by the consultant, the EM Department and the Committee/Workgroup worked together to engage local agencies and community members in the planning process.

The Columbia County LMS Committee/Workgroup is made up of a number of local government agencies, business interests, community organizations, regional agencies, and institutions. Columbia County (unincorporated), the City of Lake City, and the Town of Fort White are continuing jurisdictions and no new jurisdictions have been added since the last Local Mitigation Strategy plan. This section describes the organizational structure used to complete the public planning process.

The Columbia County LMS Committee/Workgroup *encourages participation* by all interested local and neighboring jurisdictions, agencies, organizations, and individuals. Broad community representation is promoted in the Committee 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 Committee and listed in this plan, when implemented, are intended to make the entire community a safer from the impacts of future disasters, for the benefit of every individual, neighborhood, business, and institution.

The Columbia County Department of Emergency Management is the lead agency in scheduling and conducting the efforts of the Local Mitigation Strategy Committee/Workgroup and is primarily responsible for updating the LMS plan.

The LMS Committee/Workgroup 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.

Members of many organizations were invited via e-mail correspondence to discuss the importance of participation on the Columbia County LMS Committee/Workgroup. Each jurisdiction was represented in

the LMS Committee (see Table 2.1). In addition, the Columbia County LMS Committee/Workgroup benefited from the assistance and support of its many members.

Participation in the Committee 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 Columbia County Local Mitigation Strategy* to gauge the plan effectiveness and help identify local hazards to be placed on the county project list. Participation 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 Notice was advertised on the EM Facebook page: https://www.facebook.com/pages/Columbia-County-Florida-Emergency-Management/353463268093780
- LMS Meeting Notices were published in the *Columbia County Observer: http://www.columbiacountyobserver.com/*
- LMS Meeting Notices were announced at the County Commissioner's meetings.
- A copy of the LMS plan is advertised and available online for comments

There has been public participation from the community as some residents attend the Columbia County LMS meetings as noted on the sign-in sheets in Appendix I. 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

A copy of the 2010 LMS plan was available online at examiner.com to give the public an opportunity to review the document "prior to the final plan approval". The same opportunity will be available for the 2015 LMS updated plan.

There was participation from the public (or county residents) in the LMS meetings. In addition, those member organizations listed in Table 2.1 provided a great deal of support and assistance.

Table 2.1- LMS Participating Organizations by Jurisdiction

LMS Committee/Workgroup Members	
Columbia County Department of Emergency Management	Director
Board of County Commissioners	Vice Chairman
Columbia County Building & Zoning	County Planner, Vice Chair of the LMS Committee/Workgroup
Columbia County Public Works	County Engineer
Columbia County Sheriff's Office	Sergeant
Columbia County Schools	Director of Purchasing
Columbia County 911/Addressing and GIS	GIS Coordinator
Columbia County Fire Department	Assistant Fire Chief
City of Lake City	Growth Management Director
City of Lake City	Planning & Permit Technician

Lake City Fire Department	Assistant Fire Chief
Columbia County 911	Training Coordinator
Town of Ft. White	Mayor
Florida Department of Transportation	District Emergency Coordination Officer
Florida Forest Service	Wildfire Mitigation Specialist
Lifeguard Ambulance	Operations Manager
American Red Cross, North Central Florida Chapter	Local Representative
American Red Cross, North Central Florida Chapter	Local Representative
Florida Gateway College	Assistant Director, College Facilities
Columbia County Observer	Reporter
Columbia County	Citizen
Hamilton County	Director
The Management Experts	Owner
The Management Experts	Emergency Management Planner

Summary of the Planning Process

(A) LMS Committee/Workgroup Meetings

LMS Meetings were held at the Columbia County Department of Emergency Management office, 263 NW Lake City Avenue, Lake City FL in 2010; 2011; 2012; 2013, and 2014.

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

The procedure used by the Columbia County LMS Committee/Workgroup is based on the following important concepts:

- A multi-organizational, multi-jurisdictional planning group establishes specific goals and objectives to address the community's vulnerabilities to all types of hazards.

- 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 Committee/Workgroup 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 Committee/Workgroup 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 Committee 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.

(B) Hazard Identification and Risk Estimation

The Committee/Workgroup 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 Committee 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.

(C) Vulnerability Assessment

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

- The first method is a methodical, qualitative examination of the vulnerabilities of important facilities, systems, buildings, structures 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 Committee, 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 Committee 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 Committee/Workgroup members can assess the individual jurisdictions' existing codes, 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 Columbia County LMS for future implementation when it is appropriate to do so.

The Committee/Workgroup consulted, reviewed and analyzed the following documents:

- ✓ Columbia County Comprehensive Plan
- ✓ City of Lake City's Comprehensive Plan
- ✓ Town of Ft. White's Comprehensive Plan
- ✓ Columbia County Comprehensive Emergency Management Plan (CEMP)
- ✓ County and Municipal Land Development Regulations
- ✓ County and Municipal Code of Ordinances
- ✓ State Comprehensive Plan
- ✓ State of Florida Enhanced Hazard Mitigation Plan

(D) Hazard Mitigation Projects

Developing hazard mitigation projects enables the Committee/Workgroup 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 Committee/Workgroup 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 Committee, 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 nine objective criteria.

1) Support Public Health and Safety
2) Protect Lives
3) Protect Property
4) Reduce Future Damage
5) Protect Natural Resources and Environmental Quality
6) Protect Cultural Resources
7) Support Essential Services
8) Support Community LMS and Community Guiding Principles
9) Ensure Regional Benefits

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 Committee/Workgroup 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.

(E) 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 Committee/Workgroup for review and inter-jurisdictional coordination.

The Committee/Workgroup members assure that the proposal is consistent with the goals and objectives established by each jurisdiction for the planning period. Once the Committee/Workgroup has reviewed and coordinated the submitted project, it is formally considered for incorporation into the Columbia 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 Committee 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 Attachment I for the details on the ongoing, completed, deleted or new mitigation projects for Columbia County.

(F) Approval of the Current Edition of the Plan

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.

(G) Implementation of Approved Mitigation Projects

Once incorporated into the Columbia 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 Committee/Workgroup vote and all agree. This could be developing a budget for the effort, or making application to state and federal agencies for financial support for implementation.

Current Status of Participation in the Committee/Workgroup

In order to support the participating jurisdictions in the completion of the community profiles and vulnerability assessments, the Committee/Workgroup 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 Committee/Workgroup is from the Columbia County Department of Emergency Management. The staff facilitated the work of the Committee/Workgroup 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 Columbia County LMS Committee/Workgroup 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 - Geography, Demographics, and Land Use

Requirement: §201.6 (c) (2) (ii)- The plan should describe vulnerability of providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

Geography

Columbia County is located in north-central Florida and is bordered on the north by Clinch and Echols Counties, Georgia; on the south by Alachua and Gilchrist Counties, Florida; on the east by Baker and Union Counties, Florida; and on the west by Suwannee and Hamilton Counties, Florida.

The total square miles for the county are 801 or 513,152 acres with 798 square miles of land or 510,720 acres, and 3.8 square miles of water or 2,432 acres. Approximately 126 square miles or 80,640 acres, approximately 16% of the land area is located within the Osceola National Forest on the eastern side of the County. According to the 2012 Census of Agriculture, there are 945 farms in the county consisting of 101,451 acres, approximately 20% of the land in the county.

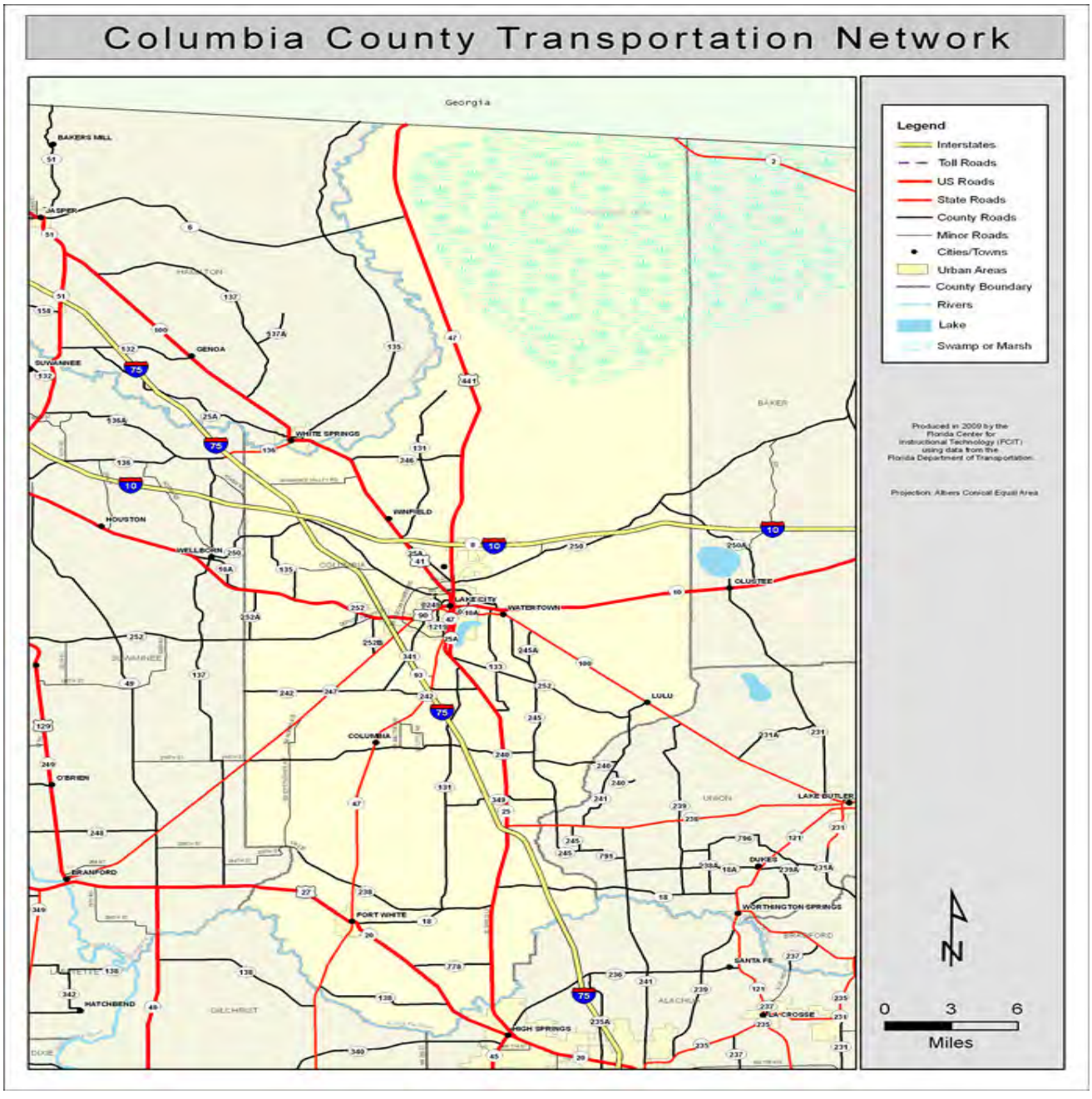
Columbia County is ranked 21st in the State of Florida for total value of agricultural products sold with a market value in 2012 of $108,574,000 (17% was crop sales - $18,916,000 and 83% was livestock sales - $89,658,000). The top crop items (acres) are: forage-land used for all hay and haylage, grass silage, and greenchop, peanuts for nuts, corn for grain, cotton, and upland cotton. The top livestock inventory items include: layers, pullets for laying flock replacement, cattle and calves, colonies of bees, and goats.

The Santa Fe River forms the boundary in the south and the Suwannee River forms a boundary on the northwest border of the County. The County is located in the Gulf Coastal Lowlands physiographic area with topography ranging from 10 feet to about 120 feet above North American Vertical Datum of 1988 (NAVD 88).

Columbia has two incorporated municipalities within its border, the City of Lake City (the county seat), and the Town of Ft. White. Since the 2010 plan approval, no new municipalities have been either created or disbanded.

The county is served by Interstates 10 and 75 located in the northwest portion of the County. Lake City and Columbia County are known as "The Gateway to Florida" because I-75 runs though the county, carrying a large percentage of Florida's tourist and commercial traffic. Lake City is the northernmost sizable town/city in Florida on I-75 and the location where I-10 and I-75 intersect. The city relies on travelers for a considerable part of its economy. See figure 3A – Columbia County Transportation Network.

Figure 3A – Columbia County Transportation Network



Source: http://fcit.usf.edu/florida/maps/pages/12200/f12259/f12259.htm

Demographics

Columbia is the 40th most populous county in Florida, with 0.3% of the State's population.

Table 3.1 – Columbia County Population Data

Estimates and Projections – Population for Columbia County	Population Count	Inmate Count	Revenue Sharing Use Only (Estimates Less Inmates)
2014 Estimate – Columbia County	67,826	4,106	63,720
City of Lake City	12,004	408	11,596
Town of Ft. White	559	0	559
Unincorporated	55,263	3,698	51,565
0.4% change from 2010 – 2014			
2015 Projection based on 2014 Estimate	68,377	N/A	
1.3% change from 2010 – 2015			
2020 Projection based on 2014 Estimate	72,045	N/A	
5.4% change from 2015 – 2020			

Sources: Office of Economic and Demographic Research (July 2015) ;
Bureau of Economic and Business Research, University of Florida (April 1, 2014)

The population density in 2014 was 85 persons per square mile.

County Structures

According to the Columbia County Property Appraisers office (June 2015), there are 24,601 structures in the County, Table 3.2 provides the type and number of structures within each jurisdiction (i.e. unincorporated Columbia County, the City of Lake City, and the Town of Ft. White).

Table 3.2 – Total Number of Structures in Columbia County

Type of Structure	County (Unincorporated and the Town of Ft. White)	City of Lake City
Single Family Residential	9,984	3,112
Multi-Family Residential	105	145
Mobile Homes	7,294	118
Agricultural	1,953	4
Commercial	775	720
Government	80	47
Institutional	163	101
Subtotals	20,354	4,247
Total		24,601

Source: Columbia County Property Appraiser, 2015

Real and Tangible Property Just Value

As stated by the Department of Revenue Property Tax Oversight, 01/2015, the total Just Value of the real property parcels, tangible personal property and railroad and private carlines and value information for the County is: $4,144,757,126.00, see Table 3.3. The “just value” is the fair value of property for tax purposes.

Table 3.3 – Total Just Value of the Real and Tangible Property in Columbia County

Property Type	# of Parcels	Just Value
Single Family Residential	19,804	$1,649,889,568
Multi-Family Residential	1,038	$78,183,784
Agricultural	3,597	$534,596,534
Vacant Residential	6,429	$117,011,068
Vacant Non-Agricultural	927	$64,380,733
Commercial	1,167	$518,964,785
Government & Institutional Taxable	396	$65,292,536
Homestead Agricultural	1,555	$272,662,831
Government & Institutional Non-Taxable	1,207	$460,374,918

Total Real Property Value	36,120	$3,761,356,757
Tangible Personal Property		$366,218,665
Railroad and Private Carlines		$17,181,704
Total Just Value		$4,144,757,126

Source: State of Florida, Department of Revenue Property Tax Oversight, 01/2015

Current Land Use

There haven't been any significant land use changes within the County. Columbia is largely rural in nature with large tract of forested, conservation and agricultural lands. The top crop items are: forage-land used for all hay and haylage, grass silage, and greenchop, peanuts for nuts, corn for grain, cotton, and upland cotton. The top livestock inventory items include: layers, pullets for laying flock replacement, cattle and calves, colonies of bees, and goats. Approximately 19% of the County population is located within the incorporated municipalities. The remaining 81% of the population resides in unincorporated areas. Minimal development is occurring on vacant and unused land, and very few or existing properties are being expanded, redeveloped, or reconstructed.

Future Land Use and Development Trends

The Columbia County Future Land Use Map (FLUM) 2024 identifies the future land development trends for the county. See Figure 3C. As noted in the FLUM, the county prediction is predominately forested, conservation and agricultural land with the overall population growth expected to increase 5.4% change from 2015 – 2020. Figure 3B are two zoomed in map areas of the City of Lake City and the Map Classifications from the FLUM for easier identification and review.

Figure 3B – City of Lake City and FLUM Map Classification

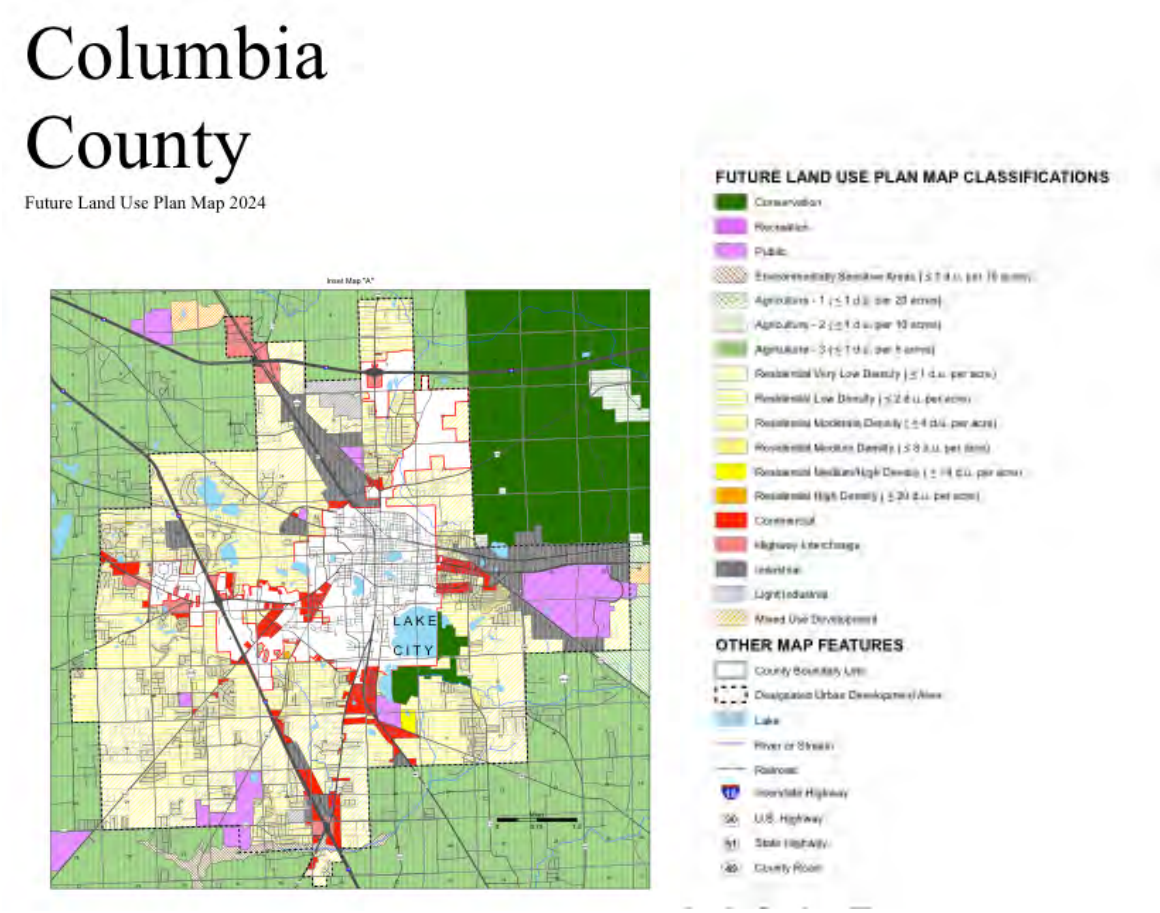
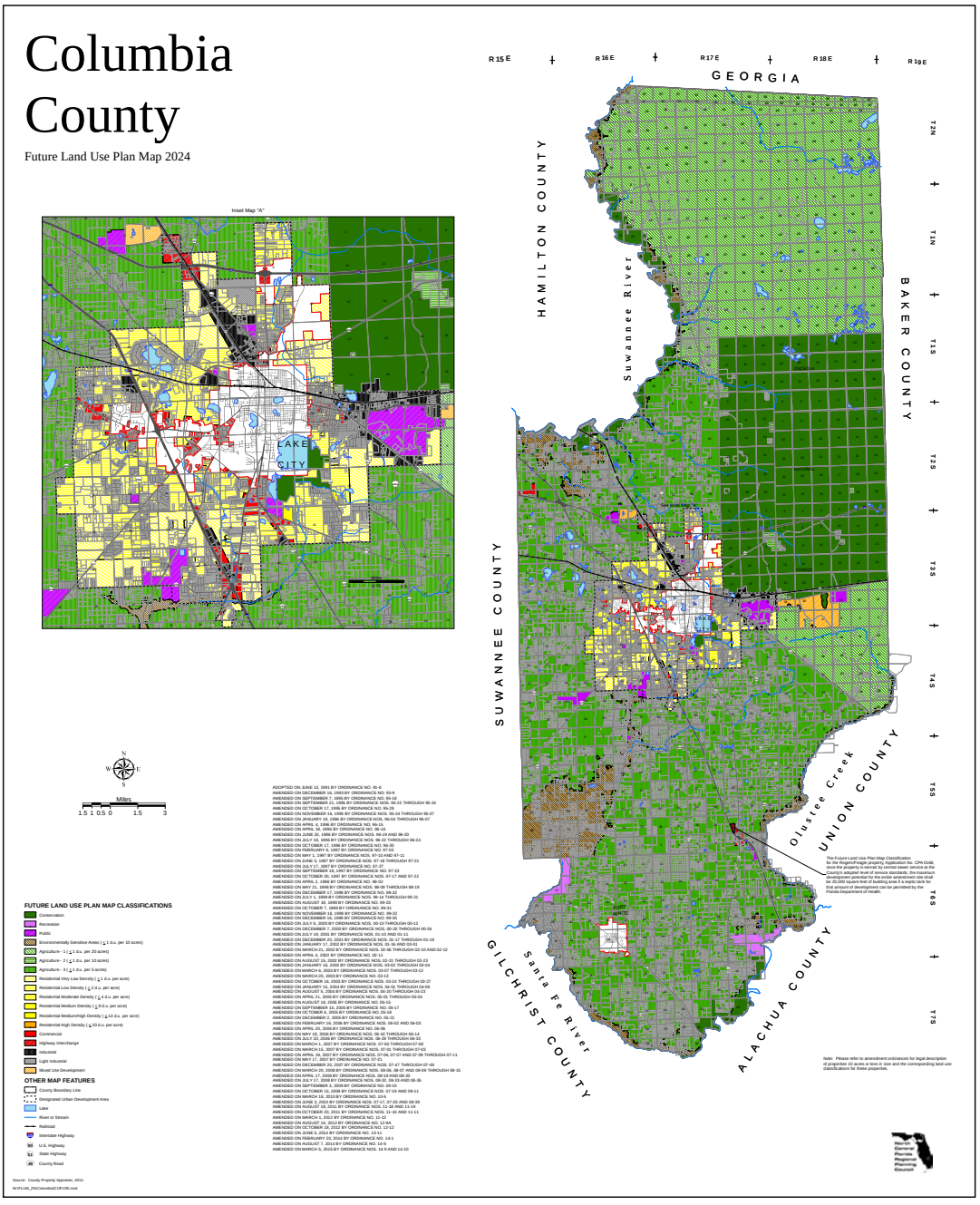


Figure 3C – Columbia County Future Land Use Map 2024



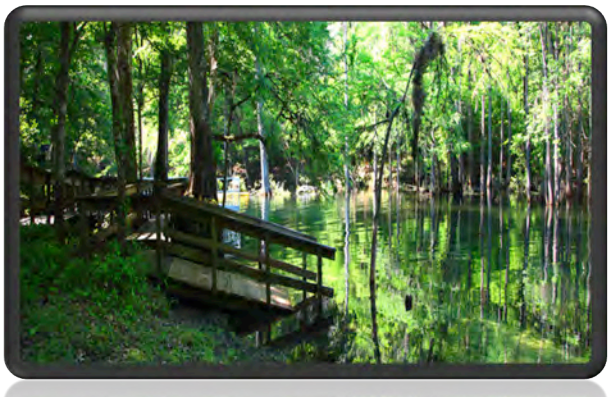
Section 4 - Hazard Risk and Vulnerability Assessment

Requirements:

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

§201.6 (c) (2) (ii) - 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 Columbia County Local Mitigation Strategy summarizes the results of the hazard identification and vulnerability assessment processes undertaken by the LMS Committee/Workgroup members. The intent of this section is to provide a summary compilation of the information gathered and the judgments made about the hazards threatening Columbia County, and the potential vulnerability to those hazards. This assessment will allow County officials and residents to make fully informed decisions as to what threatens them, how severe the threat is, and the priority to which they should mitigate those threats.



While many of the hazards discussed in this section are relevant to Columbia 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).

The natural hazards profiled in the Columbia County LMS Plan are as follows:

- Flooding

- Sinkholes
- Hurricanes/Tropical Storms
- Tornadoes
- Thunderstorm/Winds, Lightning and Hailstorms
- Erosion and Riverine Erosion
- Wildfires
- Drought and Heat Waves
- Winter Storms and Freezing Temperatures

Vulnerability Assessments

The LMS plan assesses the data available to perform the vulnerability of the hazard's impact on the community and its vulnerable structures. Specifically, this section provides the following:

- ✓ Description of all types of natural hazards that can affect the community.
- ✓ Description of the community's vulnerability to each identified hazard (with the data that was available at the time).
- ✓ Description of the location, probability, extent and impact of each identified hazard that can affect the jurisdiction.
- ✓ An assessment of each jurisdictions risk where they vary from the risks facing the entire community for each identified hazard.
- ✓ POLICY: As additional data becomes available, Columbia County will update the vulnerability in terms of the types and numbers of future buildings, infrastructure, and critical facilities located in the identified hazard areas.
- ✓ There are some minor changes to the identified hazards from the previous LMS plan. They are as follows:
    - Erosion included Riverine Erosion; Hurricanes and Coastal Storms was changed to Hurricanes/Tropical Storms; Flooding included Flash Floods and Heavy Rains; Thunderstorms was changed to Thunderstorms including High Winds, Lightning and Hailstorms. The other natural hazards will remain the same in this updated LMS plan as they have an affect and impact on the county.

Probability Assessments

Throughout the hazard section, the probability of future events will be determined for the natural hazards. 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

Medium = At least 1 occurrence every 3 years
High = At least 1 occurrence every year

Extent Assessment

Extent - Throughout the hazard section the extent statements will be determined for the hazards. The statements will be based on the range of magnitude or severity that the county could experience 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

Quantitative measurements based on historical occurrences recorded from the Suwannee River Water Management District (SRWMD); the National Climatic Data Center (NCDC), National Oceanic and Atmospheric Administration (NOAA); the National Weather Service (NWS), the Columbia 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 Columbia County Department of Emergency Management.

- Flood depth for floods
- Acres burned for wildfires
- Dimensions (length, width and depth) for sinkholes
- Extent data on soils
- High, medium or low based on the previous event occurrence

Impact Assessment

Impact - The impact is the consequence or effect of the hazard on the community and its assets. In evaluating the "impact" for Columbia County, historical detail impacts and/or an estimate of potential losses were 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: $4,144,757,126.

The hazards profiled within this section can bring difference consequences for the Columbia County's structures, infrastructure, economy and environment. The impact profiled will be summarized at the end of each hazard identified (i.e. flooding, sinkholes, tornadoes, hurricanes/tropical storms, lightning, erosion, wildfires, drought, heat wave, thunderstorms/high winds, etc.). Table 4.1 summarizes the impact of Columbia County's structures and infrastructure from the identified hazards.

Table 4.1 – Impacts on Columbia County's Structures and Infrastructure

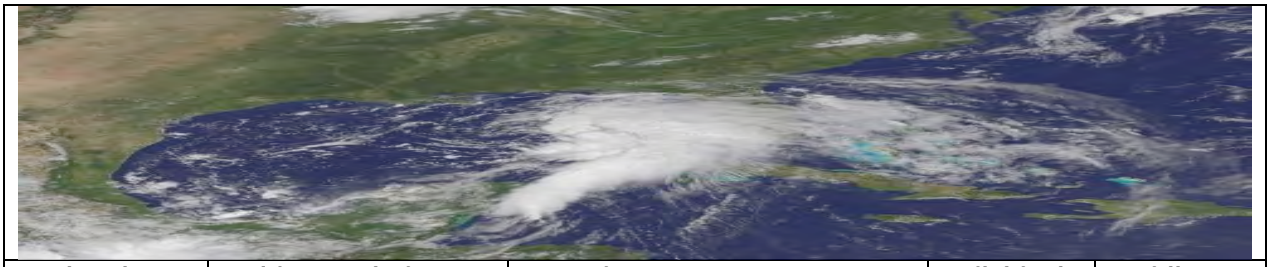
Impacts on Structures and Infrastructure from Identified Hazards	All Structures	Mobile Homes	Poorly Constructed Homes	Non-Elevated Homes	Telecommunications	Electrical Utilities	Water / Sewer Utilities	Roadways	Waterways	Agriculture	Economic Disruption	Environmental Damage
Flooding	X	X	X	X	X	X	X	X	X	X	X	X
Sinkholes	X	X	X	X			X	X	X	X	X	X
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	X
Thunderstorm/ High Winds		X	X		X	X				X		
Lightning		X	X		X	X				X		
Hailstorms		X	X		X	X				X		
Erosion								X	X	X	X	X
Riverine Erosion			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	

Natural Hazards

Disaster Declarations History

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. Table 4.2 lists the disaster declarations from August 2004 – July 2015 that have occurred in Columbia County with the last declaration in 2012.

Table 4.2 - Disasters Declarations for Columbia County (August 2004 – July 2015)



Declaration # / Date	Incident Period	Hazard Event	Individual Assistance	Public Assistance
#1539 / 8/13/2004	8/11/2004 – 8/30/2004	Hurricane Charley & Tropical Storm Bonnie		X
#1545 / 9/4/2004	9/3/2004 – 10/8/2004	Hurricane Frances	X	X
#1561 / 9/26/2004	9/24/2004- 11/17/2004	Hurricane Jeanne	X	X
#3220 / 9/5/2005	8/29/2005 – 10/1/2005	Hurricane Katrina Evacuation		X
#2689/ 5/7/2007	5/7/2007	Florida Suwannee Fire Complex		X
#3288/ 8/21/2008	8/18/2008 – 9/12/2008	Tropical Storm Fay		X
#4068/ 7/3/2012	6/23/2012 - 7/26/2012	Tropical Storm Debby	X	X

Source: FEMA - www.fema.gov/disaster

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, Columbia County is not subject to coastal flooding, but is prone to riverine flooding. There is also a significant amount of low-lying area in the center of the county that would be subject to isolated lowland flooding.

Riverine and inland flooding 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.

Figure 4A – Hydrography Map of Columbia County

Source: http://fcit.usf.edu/florida/maps/pages/11200/f11225/f11225.htm

The drainage area of the Suwannee River at the mouth is 9,950 square miles, of which 4,230 square miles are in north-central Florida, and 5,720 square miles are in south-central Georgia. The drainage area of the Santa Fe River, at the mouth, is 1,380 square miles.

Historical Flood Events

➢ *Details are from the FEMA Flood Insurance Study for Columbia County, Principal Flood Problems*

A number of major floods have occurred on the Suwannee River during the 20th century. The four largest floods at White Springs occurred in October 1947, April 1948, April 1973, and April 1984. The respective discharges associated with these floods are 23,700 cubic feet per second (cfs), 28,5000 cfs, 38,100 cfs, and 26,100 cfs. The estimated return period for floods of these magnitudes are 30, 50,150, and 40 years, respectively.

The April 1973 flood was the largest flood at the Town of White Springs since 1862 and exceeded the 1948 flood by 3 feet at the White Springs gage. Floodwaters remained over the lowland for 30 days, and for a time several major highways (Interstate 75, U.S. Route 41, and U.S. Route 129) were closed. Many people were forced to evacuate their homes, and *Columbia County was included in the "major disaster area" declared by the President.*

During peak stages of the 1948 flood, the Suwannee River was out of its banks from the Gulf of Mexico to north of the Georgia-Florida state line and its width varied from 0.5 to 6 miles. The flooded area comprised almost 500 square miles along the major rivers. The largest flood known to have occurred on the Santa Fe River in Columbia County was the flood of September 1964. The peak discharge for this flood was 17,000 cfs at the USGS gage near the Town of Ft. White and 20,000 cfs at the now non-existent USGS gage at the City of High Springs.

Note: The Town of White Springs is located in Hamilton County, however, details are noted from the as the USGS gage for the Suwannee River and the City of Lake City is approximately 13 miles from White Springs.

➢ *Details from Tropical Storm Debby*

On June 26, 2012 Tropical Storm Debby made landfall on the Florida coast, after soaking the state for 4 days while it brewed in the Gulf of Mexico. The storm's relentless rain dumped 30 inches of rain on North Florida, causing an estimate of $12 million in the County. The County was already drenched from Tropical Storm Beryl, which had moved through the area the month before Debby. The already saturated ground and filling reservoirs couldn't handle any more rain. *Debby flooded the area in two days and became according to the SRWMD, the 500-year event.*

June 2012 was the wettest June since 1932 according to the SRWMD. By July, nearly a week after Tropical Storm Debby, 400 homes were found to have damage due to severe flooding and many people were still trapped by floodwaters. By June 28, officials had rescued 53 people stranded in cars and homes across the County.

Kayaks were commons sights on area roadways, where they were used to rescue people from stranded vehicles like this one on County Road 240 — or to just get around.

Tuesday, July 3, 2012, Columbia County was declared a major disaster area and according to the FEMA Recovery Program, the County residents filed 1,789 registrations and FEMA paid $3,621,773 in household assistance.

According to the Columbia County Building and Zoning Department…."In Columbia County, the primary threat of flooding results from the ponding of water during heavy storms and the Suwannee and Santa Fe rivers reaching flood stage. Some flooding can result from overflow of small ditches and streams during significant storm events. Since Columbia County is relatively flat with low-lying areas, storm water sometimes simply overwhelms street drainage and water retention areas. Leaves and other debris can clog storm drains, culverts, and drainage swales, causing water to back up into lower-lying areas. Residents are encouraged not to blow yard waste (i.e. grass clippings, leaves, and small branches) into the street to prevent clogging of the storm water grates, culverts, and other similar devices."

Historical River Level Elevations

Table 4.3 shows the historical levels obtained from flood marks and estimated peak stages based on U.S. Army Corps of Engineers 1974 data and Suwannee River Water Management District 2014 data.

Table 4.3 – 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[P]	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

Flood Occurrences

According to the NCDC, (4/1/1950 – 4/30/2015), there were 7 flood, 8 flash flood, and 13 heavy rain occurrences reported in Columbia County over the last 65 years with location, date, time, the type of event, if there were any deaths or injury's, and the property and crop damage estimates. See table 4.4 for details.

Table 4.4 – Flood Occurrences in Columbia County – (4/1/1950 – 4/30/2015)

Location or County	Date	Time	Type	Dth	Inj	PrD	CrD
Lake City	10/2/1996	3:00	Flash Flood	0	0	0.90K	0.00K
Countywide	2/17/1998	2:35	Flash Flood	0	0	0.00K	0.00K
Lake City	2/17/1998	3:30	Flash Flood	0	0	20K	0.00K

Columbia (Zone)	3/1/1998	00:01	Flood	0	0	2.35M	0.00K
Countywide	3/30/2000	15:30	Flash Flood	0	0	3K	0.00K
Countywide	3/9/2003	10:00	Flash Flood	0	0	0.00K	0.00K
Lake City	7/7/2004	19:09	Heavy Rain	0	0	0.00K	0.00K
Columbia (Zone)	9/8/2004	00:00	Flood	0	0	0.00K	0.00K
Columbia (Zone)	9/9/2004	11:00	Flood	0	0	0.00K	0.00K
Lake City	9/9/2004	20:00	Heavy Rain	0	0	0.00K	0.00K
Columbia (Zone)	9/28/2004	12:00	Flood	0	0	0.00K	0.00K
Lake City	8/21/2006	08:30	Heavy Rain	0	0	0.00K	0.00K
Bass	7/28/2007	16:30	Heavy Rain	0	0	0.00K	0.00K
Ft. White	9/18/2009	06:15	Heavy Rain	0	0	0.00K	0.00K
Ft. White	1/21/2010	16:00	Flood	0	0	0.00K	0.00K
Ft. White	1/21/2010	16:00	Flood	0	0	0.00K	0.00K
Lake City	8/6/2011	15:00	Heavy Rain	0	0	0.00K	0.00K
Watertown	6/7/2012	16:45	Heavy Rain	0	0	0.00K	0.00K
Ft. White	6/14/2012	14:45	Heavy Rain	0	0	0.00K	0.00K
Winfield	6/25/2012	06:26	Flood	0	0	100K	0.00K
Winfield	6/26/2012	15:45	Flash Flood	0	0	10K	0.00K
Lake City	3/23/2013	12:40	Heavy Rain	0	0	0.00K	0.00K
Lake City	7/31/2013	16:00	Heavy Rain	0	0	0.00K	0.00K
Lake City	3/16/2014	22:49	Heavy Rain	0	0	0.00K	0.00K
Lake City	9/5/2014	07:00	Heavy Rain	0	0	0.00K	0.00K
Columbia	9/5/2014	23:00	Heavy Rain	0	0	0.00K	0.00K
Country Club Estates	9/6/2014	06:00	Flash Flood	0	0	100K	0.00K
Winfield	9/7/2014	04:00	Flash Flood	0	0	200K	0.00K
Totals:	Property Damage: $2,783,900						

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

Key Code: Dth: Deaths; Inj: Injuries; PdD: Property Damage;vCrD: Crop Damage

Significant property damage report detail

1) 3/1/1998 – 3/31/1998, Columbia Zone – Several counties in Florida were affected by this flooding event (St. Johns, Baker, Nassau, Union Suwannee, Alachua, Marion, Hamilton, Gilchrist, Flagler, Duval, Clay, Bradford and Putnam) and the total property damage figure for the counties was $25.523 million. Columbia County's total property damage figure was $2.35 million. The narrative states: Total flooding related to El Nino with more than 2800 homes and more than 175 businesses were destroyed.

2) 9/7/2014, Winfield- A broad low-pressure system slowly meandered over the forecast area Sept. 6th through the 8th. On the night of the 6th and 7th a widespread area of nocturnal rain broke out across inland NE Florida, which dumped rainfall amounts of 8- 14inches over portions of Columbia County, especially from Lake City southward toward Columbia. Several homes were flooded with numerous road closures. Flash flood warnings were issued for almost the same area each morning for this area of Columbia County. Widespread flooding caused numerous road closures and flooded approximately 56 homes. One flooded home was located at SW Fedora Way, and residents used canoes and kayaks to travel streets. There was about 1 foot of standing water inside the home. Portions of Interstate 10 near mile marker 296 were closed due to flooded roads. Columbia City Public Works installed pumps at the intersection of Nightshade and Broadleaf Drives due to flooded roads and water nearing homes. Portions of State Road 47 just south of Watson Road were covered in several inches of standing waters. Radar estimated about 8-13 inches between Lake City and just south of Lake City. The exact cost of property damage is unknown time. The cost of damage was estimated for inclusion of this event in Storm Data.

3) 6/25/12 – 6/26/12, Winfield - Tropical Storm Debby moved across the area from the northeast Gulf of Mexico. Deep tropical moisture combined with a stalled frontal boundary across north Florida over a period of several days caused extensive, flooding rainfall, as well as historic river flooding on the St. Marys River. A few severe storms developed each day, but the main impact was flooding rainfall and extensive river flooding which flooded homes in Baker, Charlton, Camden and Nassau counties. At 7:26 am the park service reported a 24-hour rainfall total of 4.1 inches about 2 miles east of Lake City. At 9 am on 6/25, law enforcement reported eastbound Interstate 10 at mile marker 301 was closed due to high floodwaters. At 9:15 am that morning, law enforcement reported U.S. Highway 41 southbound was closed near Interstate 10 due to floodwaters. At 9 pm, law enforcement reported Interstate 10 eastbound at mile marker 301 was closed due to standing floodwaters. At 8:16 am on 6/26, a cooperative observer reported a 24 -hour rainfall total of 8.77 inches in Lake City. On 6/28 at 3:57 pm, the public reported a monthly rainfall total of 27.55 inches with 19.99 inches between the 23rd and 26th about 5 miles northeast of Ichetucknee Springs. The cost of damage was estimated, and is likely greatly under estimated.

4) 9/6/14 - Country Club Estates - A weak low level trough extended across the Okefenokee Swamp southward across the Suwanee River Valley, which triggered early morning slow moving showers and thunderstorms across Columbia county. A moisture feed off of the Gulf of Mexico due to low level SSW winds and spokes of energy rotating around a low center meandering over the local area fueled slow moving convection, which caused flash flooding over Columbia county generally between the cities of Columbia and Lake City. Daily storm total amounts ranged from 7 to almost 10.5 inches. A survey revealed flash flooding caused a home off of SW Edward Terrace was flooded out (about 2 inches of water in the home) with sewage in the backyard. This occurred around 7 am. Around 6 am, a retention pone was flooded out and surrounded several homes off of SW Nightshade Drive about 3 miles NE of the city of Columbia. Around the same time, another

retention pond off of Fall Court surpassed bank full and flooded a garage. Several inches of floodwater covered roadways throughout Columbia County. The cost of damage was unknown, but a value was estimated for the event to be included in Storm Data.

Special Flood Hazard Area (SFHA)

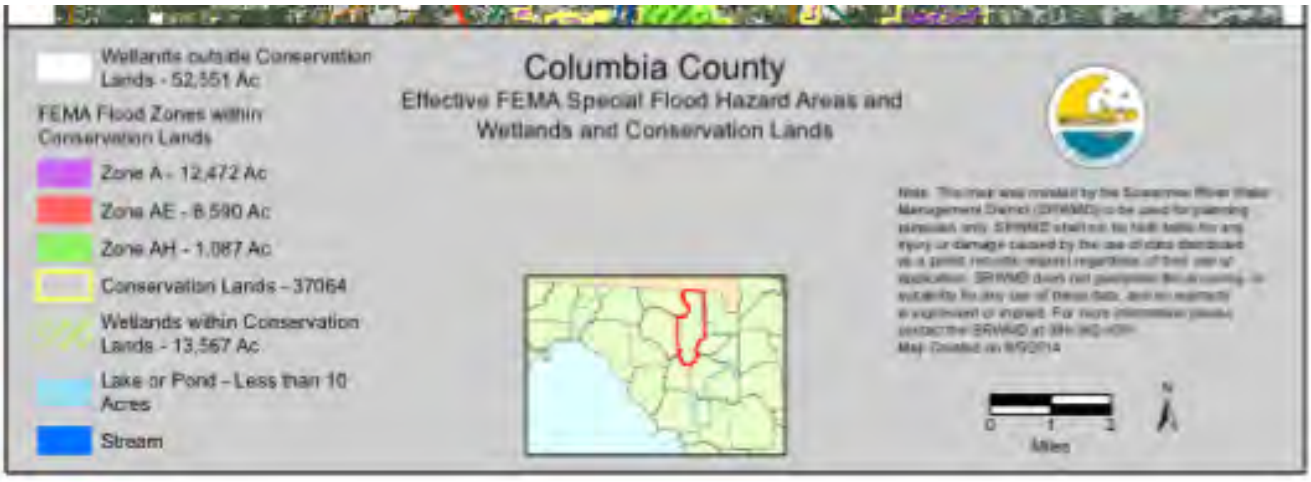
The SFHA is the land area covered by the floodwaters of the base flood on the National Flood Insurance Program (NFIP) maps. The SFHA is the area where the NFIP's floodplain management regulations must be enforced and the area where the mandatory purchase of flood insurance applies. The SFHA's in Columbia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

Table 4.5 – 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 AH	Areas subject to inundation by 1-percent-annual-chance shallow flooding (usually areas of ponding) where average depths are between one and three feet. Base Flood Elevations (BFEs) derived from detailed hydraulic analyses are shown in this zone. Mandatory flood insurance purchase requirements and floodplain management standards apply.

The SRWMD created the SFHA maps (northern and southern portions) for Columbia County on August 5, 2014, see Figures 4C and 4D. The map classification (zoomed in version) outlines the classification details of the FEMA Flood Zone areas with Conservation Lands. See Figure 4B.

Figure 4B – Map Classification for the Effective FEMA Special Flood Hazard Areas and Wetlands and Conservation Lands



SHFA Zones in Columbia County

The Zones A and AE are located predominately in the Northwest and Southeast areas of Columbia County. Zone AH is centrally located in Columbia County. See the maps below.

Figure 4C – Columbia County - FEMA Special Flood Hazard Areas,
and Wetlands and Conservation Lands (Northern portion of the County)

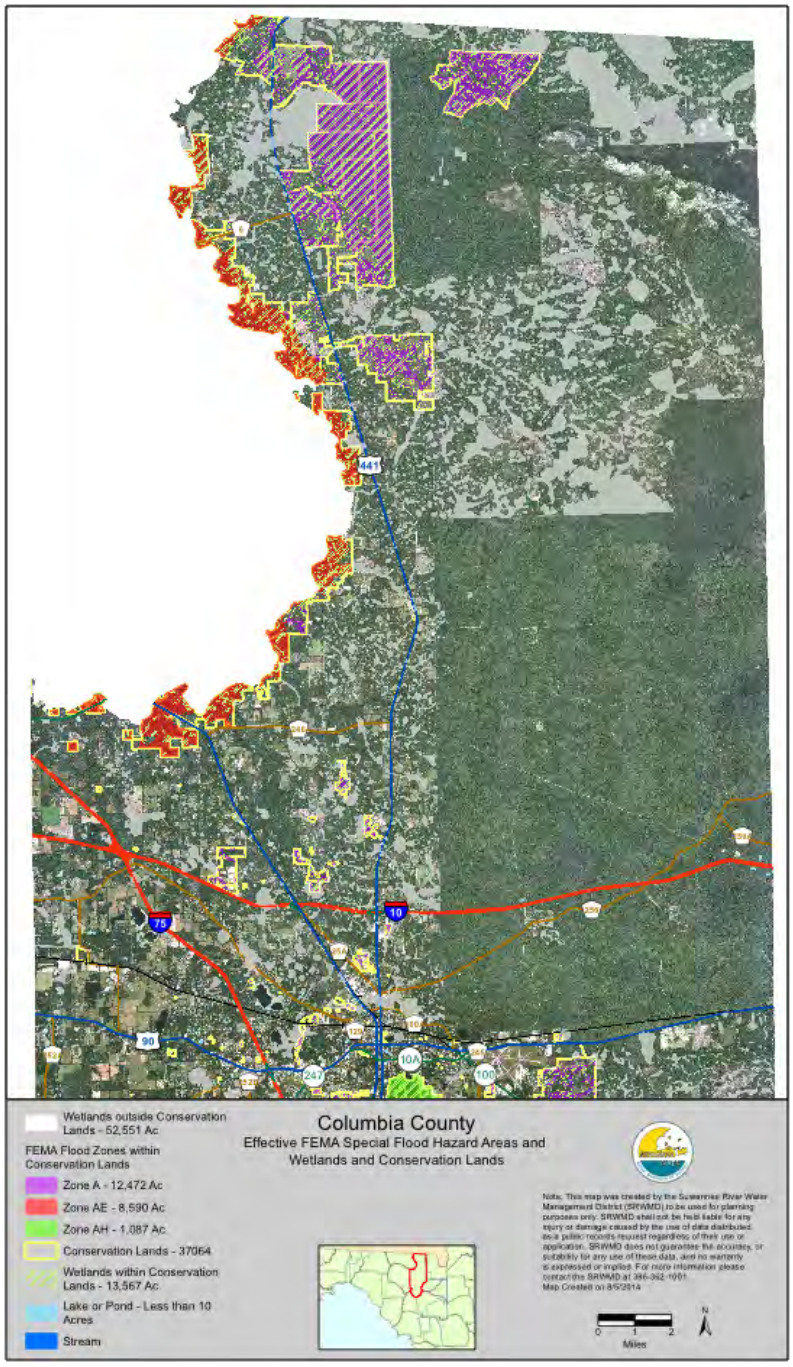


Figure 4D – Columbia

County - FEMA Special Flood Hazard Areas,
and Wetlands and Conservation Lands (Southern portion of the County)

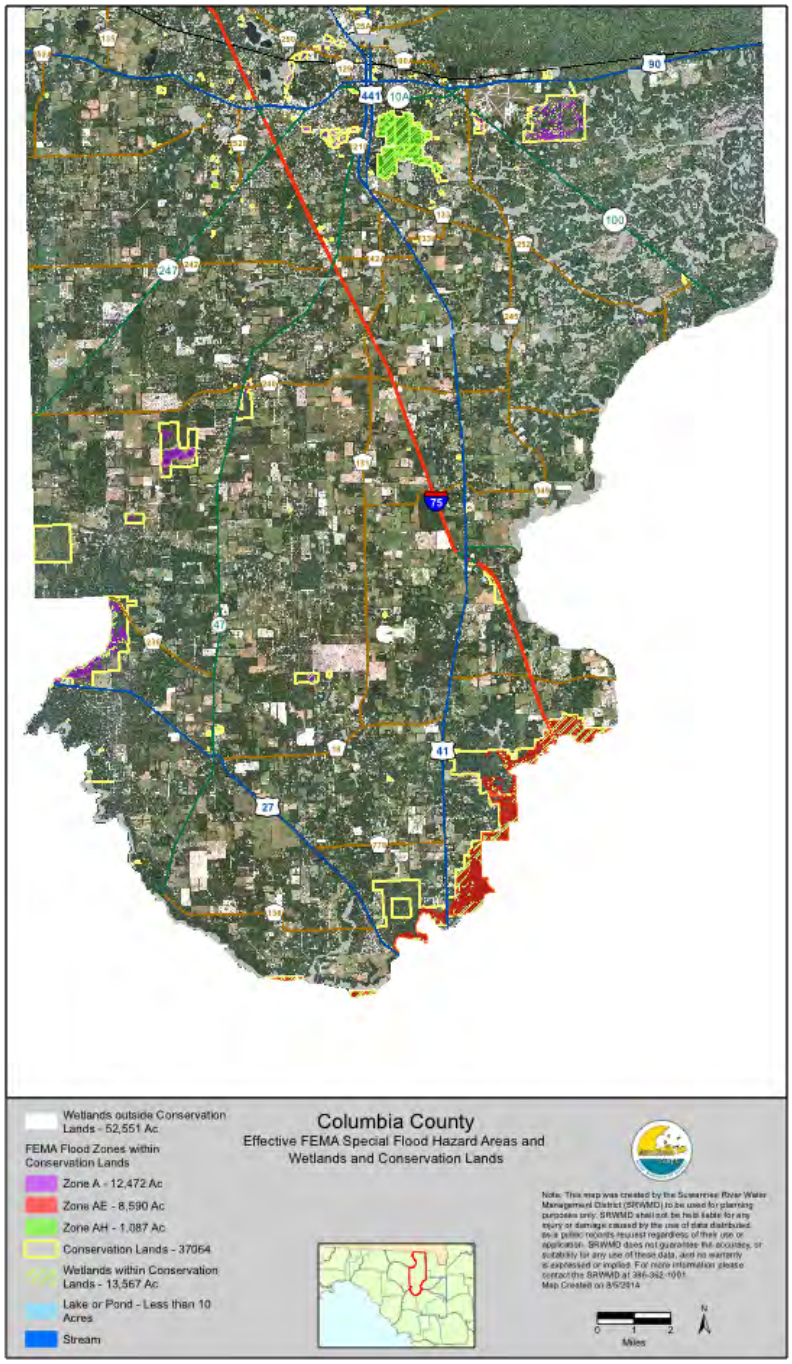
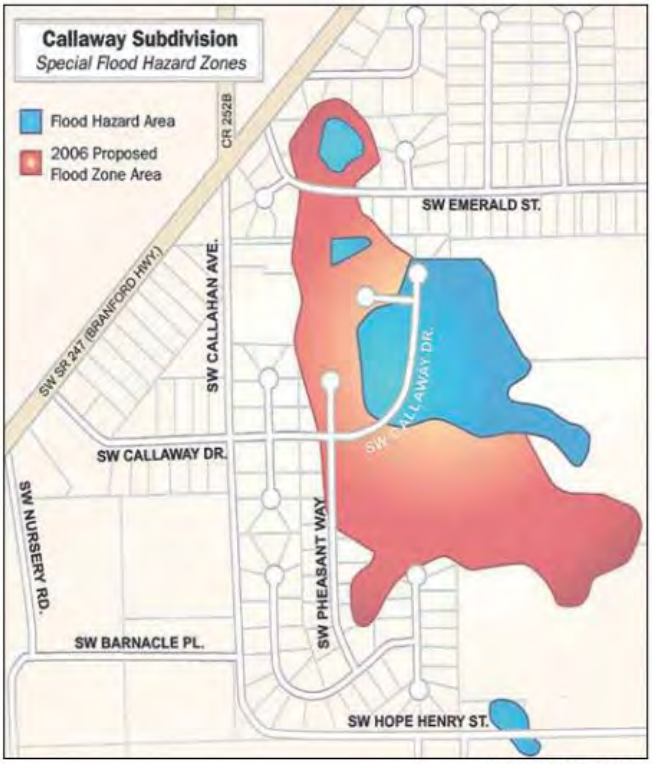


Figure 4E – City of Lake City, Callaway Subdivision, SFHA



Vulnerability for Flooding

Vulnerability to flooding events can be defined as to the extent to which people will experience harm and property will be damaged from the natural hazard. The primary cause of flooding in Columbia County is from significant rainfall in the drainage basins in Georgia. Flash flooding can occur in the county as a result of significant amounts of rainfall in low-lying areas. The Town of White Springs area (located in Hamilton County and on the border between the two counties) that lies along the Suwannee River is the most prone to flooding. Additional analysis on several areas in Columbia County that are vulnerable as identified in the SFHA maps above and summarized in Table 4.6.

Table 4.6 – Vulnerability Areas in Columbia County

Areas of Vulnerability Reference details from the Columbia County Department of Emergency Management and the SFHA Maps	
Zone A and Zone X	The primary cause of flooding in Columbia County is from significant rainfall in the drainage basins in Georgia. Flash flooding can occur in the county as a result of significant amounts of rainfall in low-lying areas. The potential flood hazard areas that vulnerable are located in the northern part of the County impacted from run off occurring from the Okeefenokee Swamp in South Georgia. Lack of homeowners and businesses carrying flood insurance can result in large uninsured losses due to rising waters.
Zone A	The Northern Conservation Area of the County and the City of Lake City, Olustee Creek Conservation Area (See Figure F and G identified in Magenta).
Zone AE	The Border of Columbia and Hamilton Counties, Suwannee River, the White Springs area that lies along the Suwannee River is the most prone to flooding. (See Figure 4C identified in Orange/Red). And, a few small areas between the border and the City of Lake City right above and below Interstate 10. The Southeastern Conservation Areas of the County, Santa Fe River (See Figures G identified in Orange/Red)
Zone AH	City of Lake City, Alligator Lake (See Figure 4D in Light Green)
Zone A	City of Lake City, Portions of the Callaway Subdivision (See Figure 4E)

Vulnerability for the Columbia County's Population

Columbia County's growth rate from 2010 to 2015 was 1.3% to 68,377 residents. Selected population areas in the unincorporated area of the County and of the City of Lake City are vulnerable to flooding events. The segment of impacted population could also include the tourist population, transient visitors, mobile home, and limited year-round residents.

Tropical Storm Debby
According to the FEMA Recovery Program, the County residents filed 1,789 registrations for individual assistance and FEMA paid $3,621,773 in household assistance.

Hurricane Frances and Jeanne
The flooding events occurred in 2004 impacting nearly 40,000 residents.

Vulnerability for Columbia County's Structures and Facilities

Tables 4.7 – 4.10 summarize the following details for the Floodplain Area (100-year and 500-year) in Columbia County on:

- the types of structures located by occupancy type in the floodplain area;
- the value of the structures;
- the county facilities within the floodplain area (100-year only); and
- the value of the county facilities (100-year only).

Table 4.7 – Structures Located in the Floodplain Area in Columbia County

Floodplain	Residential	Commercial	Medical	Industrial	Agriculture	Education	Government
100-year	1,781	34	5	12	200	2	20
500-year	183	1	1	0	14	0	3

Source: State of Florida Enhanced Hazard Mitigation Plan, Page C.10

Table 4.8 – Values of Structures in the Floodplain Area in Columbia County

Floodplain	Residential ($ million)	Commercial ($ million)	Medical ($ million)	Industrial ($ million)	Agriculture ($ million)	Education ($ million)	Government ($ million)
100-year	327,200.97	37,214.97	2,866.39	62,779.16	41,612.27	9,066.11	15,967.86
500-year	25,828.81	679.73	1,238.96	0.00	2,064.47	0.00	1,619.85

Source: State of Florida Enhanced Hazard Mitigation Plan, Page C.14

Table 4.9 – Columbia County Facilities in the Floodplain Area

Floodplain	Hospitals	Fire Stations	Police Stations	Schools	Other	Total Facilities
100-year	0	1	0	1	19	21

Source: State of Florida Enhanced Hazard Mitigation Plan, Page C.19

Table 4.10 – Value of Columbia County Facilities in the Floodplain Area

Floodplain	Hospitals ($million)	Fire Stations ($million)	Police Stations ($million)	Schools ($million)	Other ($million)	Total Facilities ($million)
100-year	0	0	0	1.52	3.85	5.37

Source: State of Florida Enhanced Hazard Mitigation Plan, Page C.22

Key Issues for Columbia County

- *Callaway Subdivision*

Located off of SR 247 in Lake City, see Figure 4E above, portions of the subdivision was designated by the FEMA National Flood Insurance as flood Zone A. Many homes were flooded in 2004 as what was described as a 100-year event, and some of the homes were demolished and others had extensive renovations.

In June 2012, Tropical Storm Debby affected Columbia County in just more than 48 hours bringing even more water into on the lowest areas in the Callaway Subdivision resulting in six feet of standing flood water.

JASON MATTHEW WALKER/Lake City Reporter

Houses in the Callaway Subdivision in Lake City sit in feet of standing flood water in this aerial photo taken June 28, 2012, after Tropical Storm Debby dumped 30 inches of rain on Columbia County in just more than 48 hours. **BELOW:** The preliminary 2006 FEMA flood zone map in the Callaway subdivision originally plotted the flood zone in a much larger area than what was ultimately approved as the critical flood zone area of concern. Columbia County officials and officials from the Suwannee River Water Management District continue to debate who is responsible.

Several weeks after the storm and in the wake of the flood waters left behind by Tropical Storm Debby, questions continue to surface about how the Callaway subdivision, an area apparently not on any critical flood zone maps, could be so easily destroyed when several retention ponds failed and water pooled as much as six feet deep in at least 10 homes for weeks.

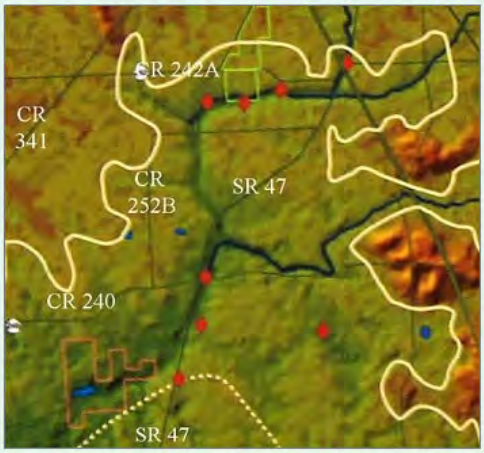
The SRWMD has established standards for stormwater retention ponds and drainage and requires that ponds are able to handle an inch of water per-hour, however, the rain from Tropical Storm Debby was far greater than the retention ponds were able to hold.

Article on Flood Prone Areas in Columbia County

- *SR 47; CR 240; CR242; CR341*

The lakecityjournal.com wrote an article in July 8, 2012 in reference to roads (SR 47; CR 240; CR242; CR341) and neighborhoods (Callaway Subdivision) in Columbia County prone to flooding were the Old Ichetucknee River once ran through them. See Appendix IV for details.

Selected specifics from the article: Lake City residents travelled from Alligator Lake to the Ichtetucknee River by boat a century ago. Today, people take the same route, but it is called SR 47. Tributaries that flowed into the Ichetucknee River also have new names, including CR 240, 242 and 341. The river went underground many years ago, following a series of channels through the limestone, marked on the surface by springs and sinks. On rare occasions, the underground fills to capacity. Then the old riverbed once again becomes a river and the tributaries overflow with rainwater. People who own homes, businesses and farms are suddenly are in the midst of a flood.



Red diamonds mark the springs along the Ichetucknee Trace, shown in dark green lines. Roads follow the trace in many places and cross it in other locations. The yellow line follows the Cody Scarp. (SRWMD graphic, edited by the LakeCityJournal.com)

Summary details for flooding events:

Probability	The probability of flooding is moderate to possibly high (at least 1 occurrence every year).
Location	The unincorporated areas especially near the Town of White Springs, which is located in Hamilton County, however, near the border of Columbia County and selected areas of Lake City, Callaway Subdivision, are at a moderate to possibly high risk to flooding events.

	Columbia County is subject to flooding as a result of 100-year storm events. According to the FEMA flood zone designations, the majority of the A zone areas (1% annual chance of flooding) are in the more rural, unincorporated areas of the County. According to accounts of historical flood events, there has been significant localized flooding when a storm produces a large amount of heavy rain in a short time period. This localized flooding can be attributed to storm drains becoming clogged, damaged, or defective, and incapable of performing the proper draining function in the incorporated areas of the County.
Extent	Based on the quantitative measurement and referencing the flood depth for this hazard, the worse case scenario would be the homes that flooded during Tropical Storm Debby that affected Columbia County in just more than 48 hours bringing approximately 30 inches of rain onto the lowest areas in the Callaway Subdivision resulting in six feet of standing flood water. *Debby flooded the area in two days and became according to the SRWMD, the 500-year event.* June 2012 was the wettest June since 1932 according to the SRWMD. Note – Details from NCDC on Tropical Storm Debby, at 8:16 am on 6/26, a cooperative observer reported a 24 -hour rainfall total of 8.77 inches in Lake City. On 6/28 at 3:57 pm, the public reported a monthly rainfall total of 27.55 inches with 19.99 inches between the 23rd and 26th about 5 miles northeast of Ichetucknee Springs. The cost of damage was estimated, and is likely greatly under estimated. In addition, the April 1973 flood was the largest flood at the Town of White Springs since 1862 and exceeded the 1948 flood by 3 feet at the White Springs gage. (The Town of White Spring is located approximately 12.8 miles northwest of Lake City). Floodwaters remained over the lowland for 30 days, and for a time several major highways (Interstate 75, US Route 41, and US Route 129) were closed. Many people were forced to evacuate their homes, and Columbia County was included in the “major disaster area” declared by the President.”
Impact	The Columbia County community, the residents, structures, and critical facilities, and infrastructure suffered from Tropical Storm Debby. The storm’s relentless rain dumped 30 inches of rain on North Florida, causing an estimate of *$12 million in the County*. The County was already drenched from Tropical Storm Beryl, which had moved through the area the month before Debby. The already saturated ground and filling reservoirs couldn’t handle any more rain. By July, nearly a week after Tropical Storm Debby, 400 homes were found to have

	damage due to severe flooding and many people were still trapped by floodwaters. By June 28, officials had rescued 53 people stranded in cars and home across the County. Tuesday, July 3, 2012, Columbia County was declared a major disaster area and according to the FEMA Recovery Program, the County residents filed 1,789 registrations and FEMA paid $3,621,773 in household assistance. Also, the March 1998 flood event that caused over $2.35 million in property damage. According to NCDC, more than 2800 homes and 175 businesses were destroyed from the 1998 flood event, however, this recorded figure on homes and businesses were from several counties and specifics for Columbia County was not recorded.

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.

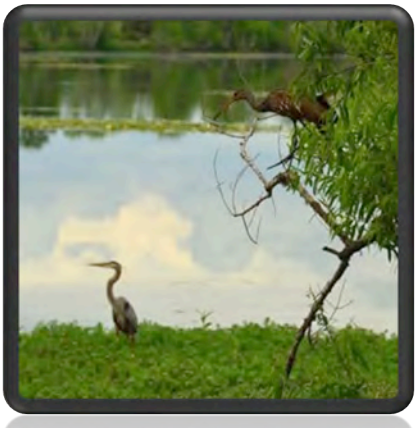
According to the SRWMD and the U.S. Geological Survey

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
- Diverting drainage to the areas where a cavity exists.

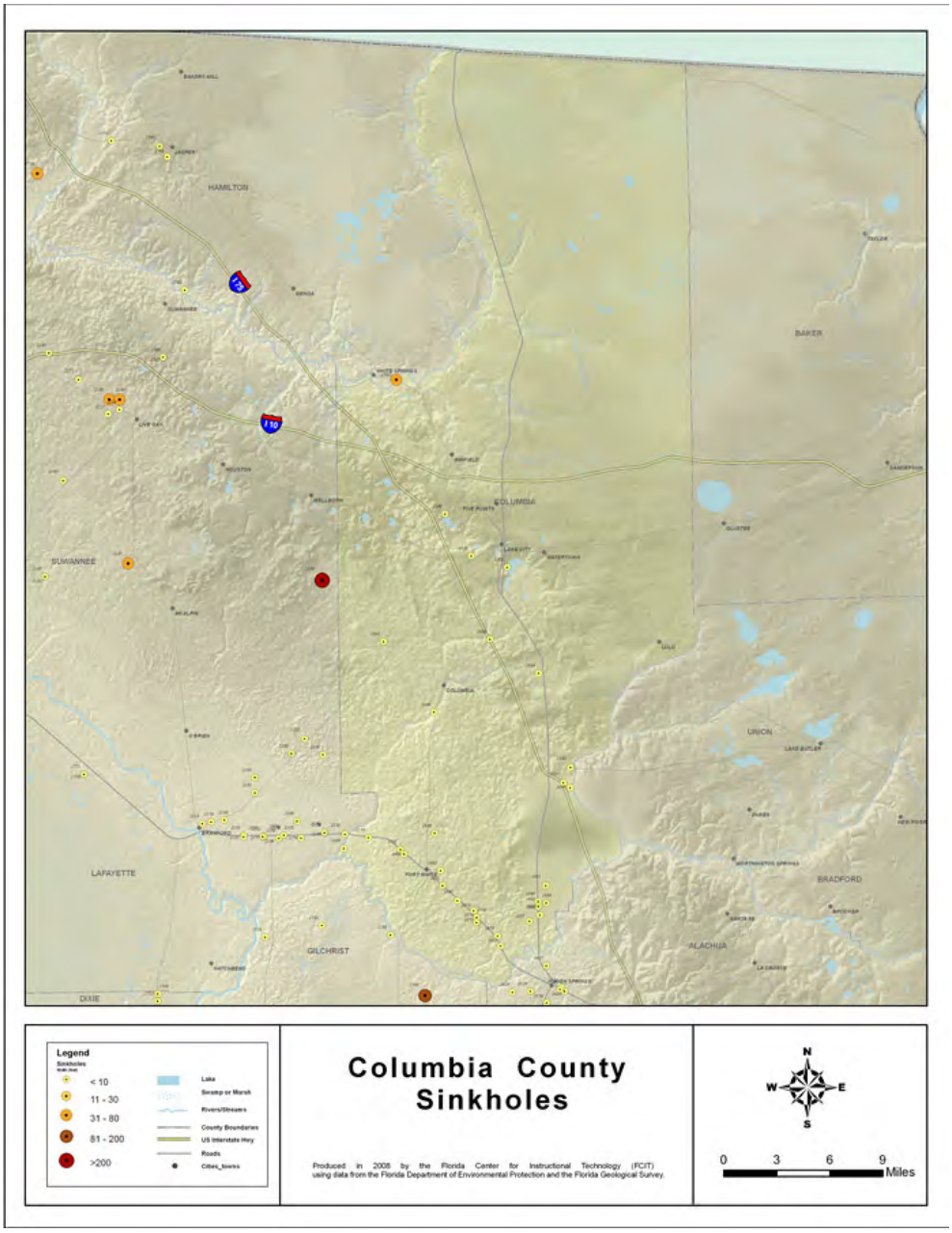
A solution sinkhole, on the other hand, develops slowly and continuously. It forms where sand or other relatively thin materials slowly and steadily sprinkle downward to fill the cracks and joints that occur in the underground limestone layers.



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.

Located in Columbia County, Alligator Lake, (photo on the left), is an example of a sinkhole lake.

Figure 4F – Sinkhole Map of Columbia County



Source: http://fcit.usf.edu/florida/maps/pages/11100/f11122/f11122.htm

Sinkhole Occurrences

Sinkhole occurrence locations have been documented on public and private properties in Columbia County. Due to the inability to access to private property, it is likely that possible sinkhole occurrences have not been recorded and are not mapped by the county. The public property sinkholes have been recorded by the Florida Geological Survey and by the County Department of Emergency Management and are noted in table 4.11.

Table 4.11 – Sinkhole Occurrences in Columbia County

Date Discovered	Latitude	Longitude
7/27/1970	29.8875	-82.66528
10/21/1970	29.8875	-82.67222
1/1/1970	29.90972	-82.69861
10/11/1971	29.8875	-82.61111
8/25/1971	29.86806	-82.64722
10/20/1971	29.88889	-82.66944
6/26/1973	30.11667	-82.65833
8/16/1973	29.93611	-82.69583
9/6/1972	29.93611	-82.73472
9/25/1972	29.89167	-82.73472
10/30/1972	29.85972	-82.64444
10/31/1972	29.89583	-82.60833
1/15/1974	29.88472	-82.60694
6/9/1974	30.11667	-82.6625
1/14/1975	29.95278	-82.70556
1/25/1975	29.89722	-82.68472
unknown	29.88333	-82.66667
unknown	29.89167	-82.60833
unknown	29.89167	-82.60833
2/6/1978	30.08333	-82.60556
6/27/1983	30.05222	-82.705
9/30/1982	29.93972	-82.73806
3/19/1985	30.17083	-82.66667
9/15/1988	29.99306	-82.58333
3/4/2005	30.17	-82.71
1/2/2007	30.021	-82.77703
5/17/2009	29.8884	-82.69616

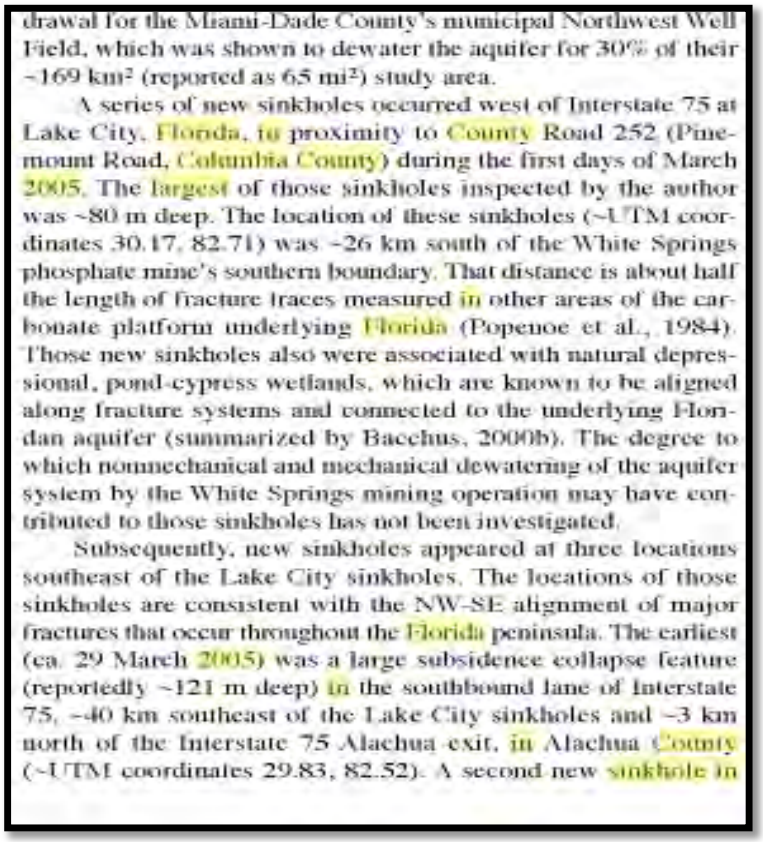
According to the Columbia County Department of Emergency Management, there have been no significant sinkhole occurrences in the county since May 2009.

As reported by the Geological Society of America, the largest sinkhole in Columbia County was in March 2005. Details reveal that during the first days in March, the largest of the sinkholes was 80 m deep or 262.467 feet deep and the location was 30.17 and -82.71, approximately 16 miles south of the White Springs phospate mine's southern boundary. See figure 4G.

Figure 4G– Sinkhole in Columbia County – March 4, 2005

Subsequently, new sinkholes appearaed at three locations southeast of the Lake City sinkholes. The first was on March 29, 2005 was a large subsidence collapse located in the southbond lane of I-75, approximately 25 miles southeast of Lake City and around 2 miles north of Alachua exit was another sinkhole 121 meters or approximately 397 feet deep in Alachua County.

Figure 4H – Geological Society of America



drawal for the Miami-Dade County's municipal Northwest Well Field, which was shown to dewater the aquifer for 30% of their ~169 km² (reported as 65 mi²) study area.

A series of new sinkholes occurred west of Interstate 75 at Lake City, Florida, in proximity to County Road 252 (Pinemount Road, Columbia County) during the first days of March 2005. The largest of those sinkholes inspected by the author was ~80 m deep. The location of these sinkholes (~UTM coordinates 30.17, 82.71) was ~26 km south of the White Springs phosphate mine's southern boundary. That distance is about half the length of fracture traces measured in other areas of the carbonate platform underlying Florida (Popenoe et al., 1984). Those new sinkholes also were associated with natural depressional, pond-cypress wetlands, which are known to be aligned along fracture systems and connected to the underlying Floridan aquifer (summarized by Bacchus, 2000b). The degree to which nonmechanical and mechanical dewatering of the aquifer system by the White Springs mining operation may have contributed to those sinkholes has not been investigated.

Subsequently, new sinkholes appeared at three locations southeast of the Lake City sinkholes. The locations of those sinkholes are consistent with the NW-SE alignment of major fractures that occur throughout the Florida peninsula. The earliest (ca. 29 March 2005) was a large subsidence collapse feature (reportedly ~121 m deep) in the southbound lane of Interstate 75, ~40 km southeast of the Lake City sinkholes and ~3 km north of the Interstate 75 Alachua exit, in Alachua County (~UTM coordinates 29.83, 82.52). A second new sinkhole in

Source: Perspectives on karst geomorphology, hydrology, and geochemistry – a tribute volume to Derek C Ford and William B White - Edited by Russell S Harmon and Carol M Wicks, page displayed by permission of the Geological Society of America, page 228

Sinkhole Study

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.

The results of the pilot study will culminate in the production of a model that will generate a map showing the relative vulnerability of these counties to potential sinkhole formation, and then will be used to produce a statewide map.

Ultimately, 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. Data on the study for Columbia County was not available at this time.

Vulnerability for Sinkholes

Vulnerability to sinkhole events can be defined as to the extent to which people will experience harm and property will be damaged from the natural hazard. Sinkhole occurrence locations have been documented on public and private properties in Columbia County, however, due to the inability to access to private property, it is likely that possible sinkhole occurrences have not been recorded and are not mapped by the county. The most vulnerable areas are located in the Southwest quadrant of the county, West of State Road 47 and South of County Road 240.

As noted above in the Sinkhole Study, analysis will generate a map showing the relative vulnerability of the potential sinkhole formation and mitigation measures will need to be studied. A statewide map will be available to assist in creating more efficient hazard mitigation strategies. Dr. Jon Arthur, Director of Florida Geological Survey states… "It is important to understand the geological character of the ground below us and this project will provide a map of the relative vulnerability to sinkhole formation in Florida as an important hazard mitigation planning tool. There is a national interest in our innovative approach to this project, and we are excited to begin the work of developing input data layers for the model."

Vulnerability for the Columbia County's Population

It is estimated a very small population of Columbia County will be effected by a sinkhole.

Vulnerability for Columbia County's Structures and Facilities

The County community and structures have been vulnerable from sinkhole events. Specific details on structures by occupancy type, facilities, and systems were not available.

Key Issues for Columbia County

- The area associated approximately 16 miles south of the White Springs phospate mine's southern boundary could present an issue for the County and might require review as natural depressional, pond-cypress wetlands, which are known to be aligned along fracture systems, are connected to the Florida aquifer and this area could result in further sinkholes.

- Also, the areas are located in the Southwest quadrant of the county, West of State Road 47 and South of County Road 240.

Summary details for sinkhole events:

Probability	The probability of sinkholes is medium (at least 1 occurrence every 3 years).
Location	The entire planning area (the incorporated and unincorporated areas of Columbia County) is at medium risk to sinkhole events. Sinkholes are localized naturally occurring events and are known to affect the City of Lake City, the Town of Ft. White, and unincorporated areas of the County. When they strike populated areas or critical facilities, they can be disastrous. If large enough, sinkholes can become disruptive to the point of creating an emergency. According to the Figure H, most of the sinkholes mapped for the county are located in the southern portion of the county (unincorporated area) along US Hwy 27 through the Town of Ft. White and US 441.
Extent	Based on the data recorded by the Geological Society of America, the largest sinkhole in Columbia County was in March 2005. Details reveal that during the first days in March, the largest of the sinkholes was 80 m deep or 262.467 feet deep and the location was latitude 30.17 and longitude -82.71, approximately 16 miles south of the White Springs phospate mine's southern boundary. Note: In reference to the several new sinkholes that opened up in March 2005 were associated with natural depressional, pond-cypress wetlands, which are known to be aligned along fracture systems and conneted to the underlying Floridan acquifer.
Impact	The Columbia County community, the residents, and structures have been impacted from sinkhole events. As recorded by the Geological Society and reported to Columbia County Emergency Management in March 2005, the County experienced several large sinkholes. Although these new sinkholes in 2005 were associated with natural depressional, pond-cypress wetlands, which are known to be aligned along fracture systems, are connected to the Florida aquifer and possibly not located in populated areas, there was destruction to a home in the County from a sinkhole. Read details below. On March 4, 2005, a sinkhole that measured approximately 80m deep swallowed a tree and part of an outbuilding beside a home resulting in large cracks that developed in the foundation on the side building attached to the

	house. According to Columbia County Sheriff's Office, thousands of gallons of water from nearby Pueschel Pond flowed into the hole after the formation. See figure 4G. According to the Columbia County Department of Emergency Management - Several large sinkholes have occurred in Columbia County within the past several years causing major property damage all of which was covered by individual homeowners insurance. In addition, sinkholes can have very localized structural impact, however 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.

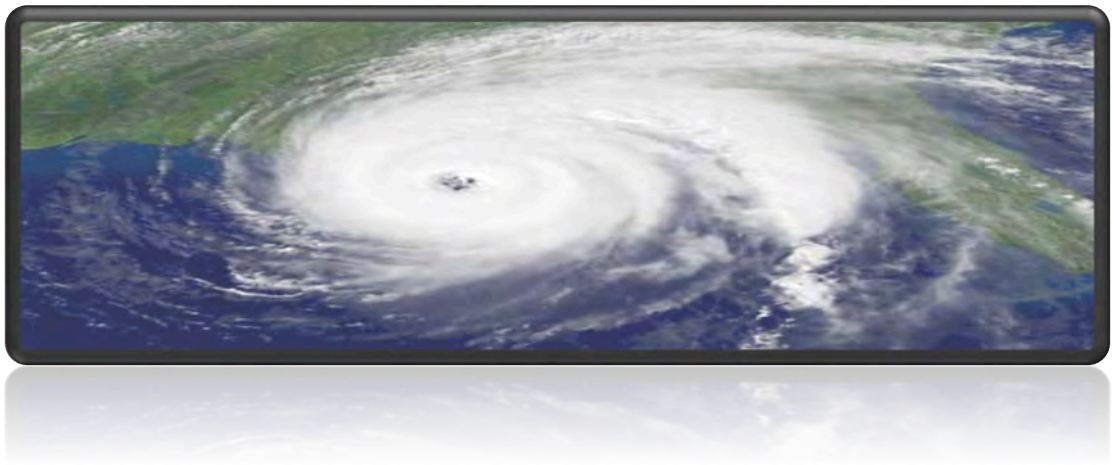
Hurricane/Tropical Storms

Tropical storms and tropical cyclones will be profiled within this section. A tropical storm is a tropical cyclone with maximum sustained winds of at least 39 mph. 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.

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. When a hurricane nears land, it may cause torrential rain, high wind, storm surge, coastal flooding, inland flooding, and sometimes tornadoes. A tropical storm is classified as a hurricane once winds goes up to 74 miles per hour or higher.

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 4I, the Saffir-Simpson Hurricane Wind Scale for specifics on a hurricane's sustained wind speed.

Figure 4I: 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.

Columbia 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. Details in Figure 4J show that a H3 or Category 3 hurricane passed and made landfall in Columbia County. Note: In Figure 4J, H1 refers to Category 1 hurricanes on the Saffir-Simpson scale and so forth.

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."

Figure 4J – Tracks of hurricanes passing near to and making landfall over Florida 1851- 2006

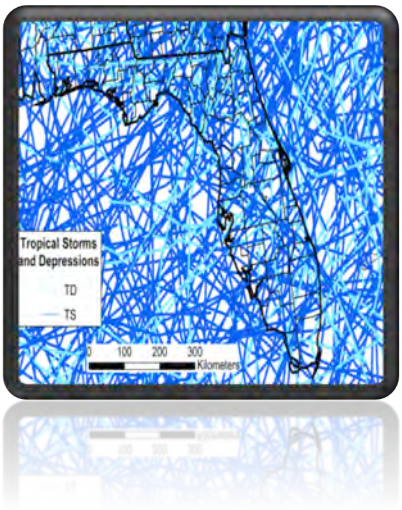
The conditions, which typically are associated with an active Atlantic hurricane season - and can also

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

Figure 4K – Tracks of tropical depressions and tropical storms passing near to and making landfall over Florida 1851- 2006



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 L identifies numerous tropical storms that made landfall in Columbia County.

Recent Tropical Storm Events

In June 2012, Tropical Storm Debby moved across the area from the northeast Gulf of Mexico. Tropical moisture combined with a stalled frontal boundary across north Florida over a period of several days caused extensive flooding and heavy rain with approximately 4.1 inches about 2 miles east of Lake City to over 8 inches in Lake City within a 24-hour period. There were road closures due to standing floodwaters and within a few days a monthly rainfall totaled approximately 30 inches with approximately 20 inches between about 5 miles northeast of Ichetucknee Springs in Ft. White.

Hurricane/Tropical Storm Occurrences

There were four recorded hurricane and tropical storm events reported in Columbia County per the NCDC (4/1/1950 – 4/3/2015) over the last 65 years. Some of the tropical storms were the result of a hurricane event heading inward onto land.

Table 4.12 – Hurricane and Tropical Storm Occurrences in Columbia County (4/1/1950 – 4/30/2015)

Location or County	Date	Time	Type	Dth	Inj	PrD	CrD
Columbia (Zone)	9/4/2004	21:00	Tropical Storm	0	0	0.00K	0.00K
Columbia (Zone)	9/25/2004	12:00	Tropical Storm	0	0	0.00K	0.00K
Columbia (Zone)	6/13/2006	06:00	Tropical Storm	0	0	0.00K	0.00K
Columbia (Zone)	8/21/2008	16:00	Tropical Storm	0	0	0.00K	0.00K
Totals:	N/A						

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

The Columbia County Building and Zoning Department provides ultimate design wind speed maps for risk categories I, II, III, and IV on buildings and other structures in the County. The sources for the research and mapping were the Florida Department of Community Affairs, Codes and Standards Division, Applied Research Associates, Inc., the Florida Geographic Data Library, the Florida Building Code 2010, and the Columbia County Building and Zoning Department completed in September 2011. See Figures 4L – 4O.

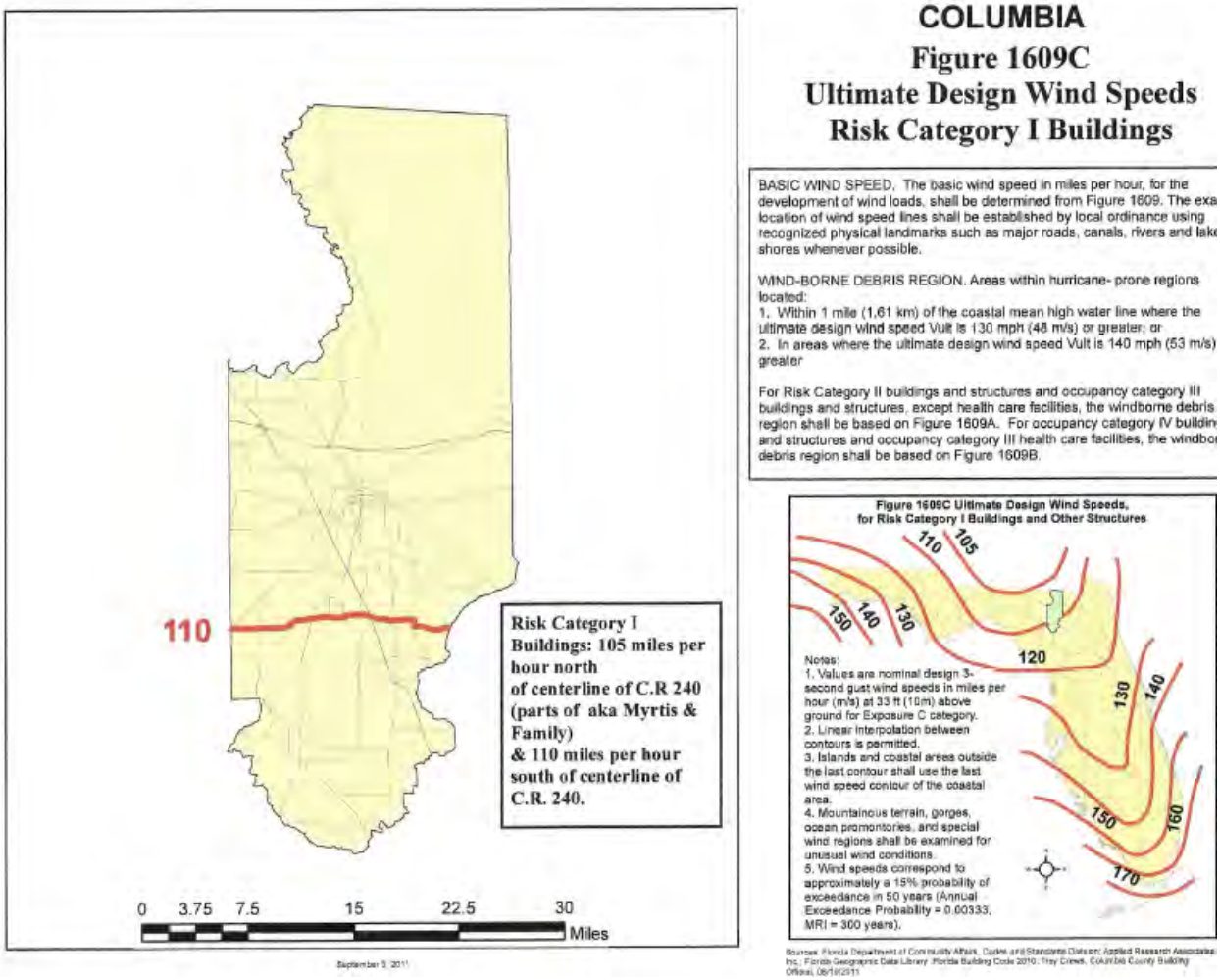
As building codes become more defined, loading conditions for wind have generally increased. A new building especially built along the coast may be designed for 120-mph winds, whereas a 40-year-old building may have only had to be designed for 80-mph winds. Sometimes, though, the exact opposite is true. Sometimes the older buildings sustain less damage while newer and commonly lighter buildings sustain more damage. This condition is the use of bigger, thicker materials, which are often heavier that can help restrict the movement of a structure.

Figure 4L – Risk Category of Buildings and Other Structures in Columbia County

RISK CATEGORY	NATURE OF OCCUPANCY
I	Buildings and other structures that represent a low hazard to human life in the event of failure, including but not limited to: • Agricultural facilities. • Certain temporary facilities. • Minor storage facilities. • Screen enclosures.
II	Buildings and other structures except those listed in Risk Categories I, III and IV
III	Buildings and other structures that represent a substantial hazard to human life in the event of failure, including but not limited to: • Buildings and other structures whose primary occupancy is public assembly with an occupant load greater than 300. • Buildings and other structures containing elementary school, secondary school or day care facilities with an occupant load greater than 250. • Buildings and other structures containing adult education facilities, such as colleges and universities, with an occupant load greater than 500. • Group I-2 occupancies with an occupant load of 50 or more resident patients but not having surgery or emergency treatment facilities. • Group I-3 occupancies. • Any other occupancy with an occupant load greater than 5,000[a]. • Power-generating stations, water treatment facilities for potable water, waste water treatment facilities and other public utility facilities not included in Risk Category IV. • Buildings and other structures not included in Risk Category IV containing sufficient quantities of toxic or explosive substances to be dangerous to the public if released.
IV	Buildings and other structures designated as essential facilities, including but not limited to: • Group I-2 occupancies having surgery or emergency treatment facilities. • Fire, rescue, ambulance and police stations and emergency vehicle garages. • Designated earthquake, hurricane or other emergency shelters. • Designated emergency preparedness, communications and operations centers and other facilities required for emergency response. • Power-generating stations and other public utility facilities required as emergency backup facilities for Risk Category IV structures. • Structures containing highly toxic materials as defined by Section 307 where the quantity of the material exceeds the maximum allowable quantities of Table 307.1(2). • Aviation control towers, air traffic control centers and emergency aircraft hangars. • Buildings and other structures having critical national defense functions. • Water storage facilities and pump structures required to maintain water pressure for fire suppression.

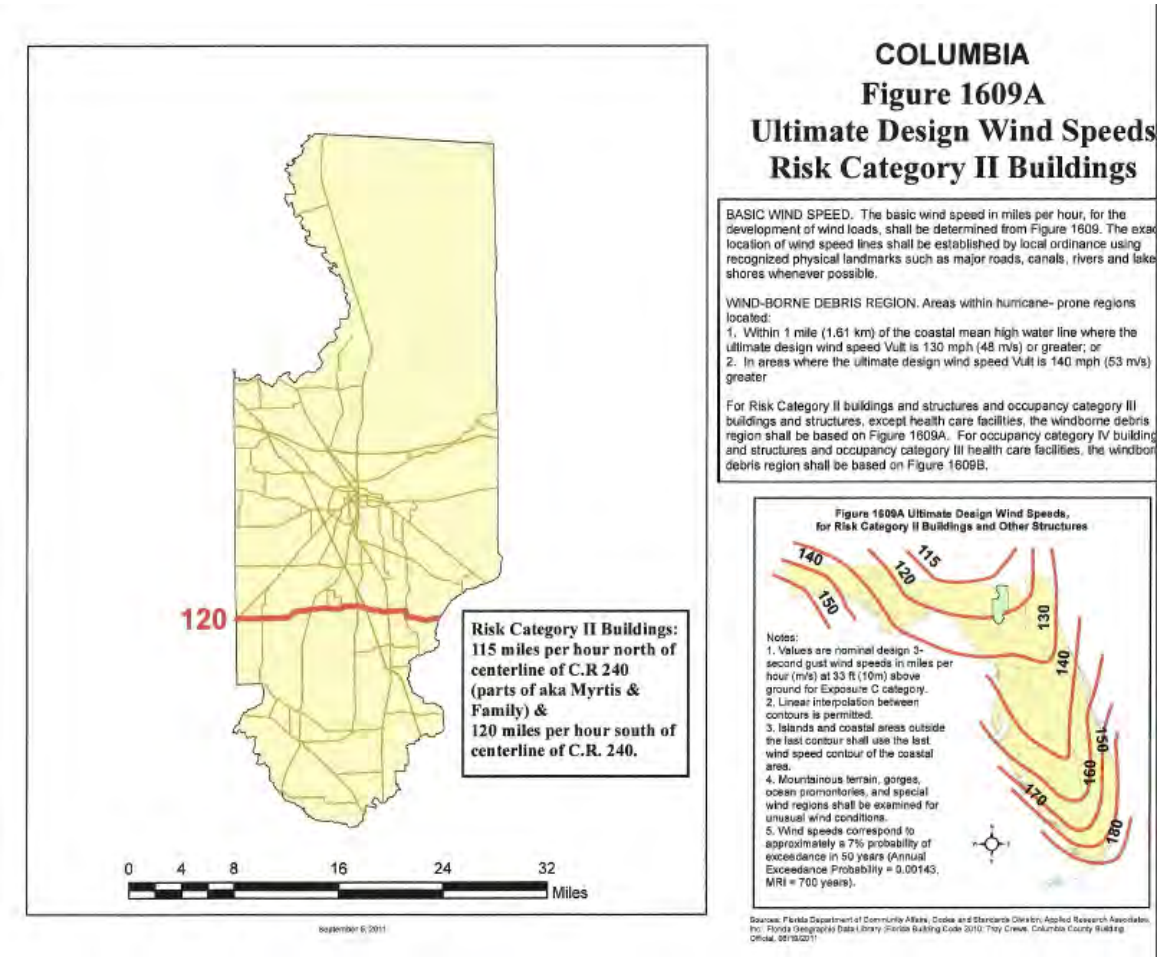
Source: Columbia County Building and Zoning Department

Figure 4M – Wind Speed Risk Category I Buildings



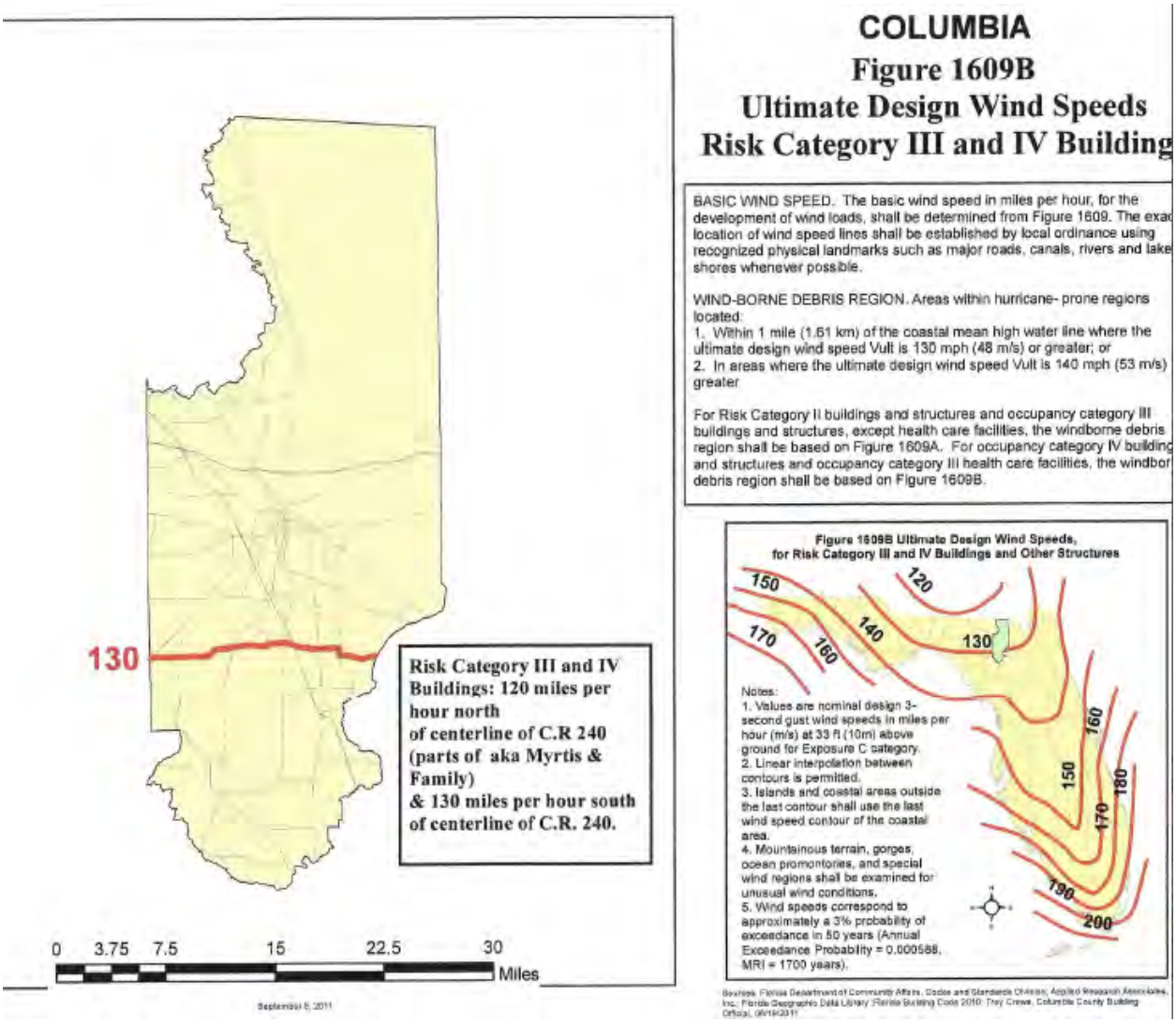
Source: Columbia County Building and Zoning Department

Figure 4N – Wind Speed Risk Category II Buildings



Source: Columbia County Building and Zoning Department

Figure 4O – Wind Speed Risk Category III and IV Buildings



Source: Columbia County Building and Zoning Department

Vulnerability for Hurricanes/Tropical Storms

Vulnerability to hurricane and tropical storm events can be defined as to the extent to which people will experience harm and property will be damaged from the natural hazard. There is no record of Columbia County being affected by sustained hurricane force winds, however, vulnerability to hurricane force winds and heavy rains is compounded by the high concentration of mobile home residents which is approximately 36%. Due to the number of mobile homes, older homes, poorly constructed homes, and agribusiness structures, the property damage would be extensive.

Vulnerability for the Columbia County's Population

Columbia County's growth rate from 2010 to 2015 was 1.3% to 68,377 residents. A hurricane or tropical storm could effect the entire population. Approximately 36% of the mobile home residents could require evacuation prior to any strike in this area. Due to the lack of occurrence of a major hurricane in the area, evacuation orders would not be complied with.

In addition, during tropical storms and hurricane events, Columbia County by its location, I-75 and I-10, is vulnerable to refugees of mass evacuation. And, extreme traffic congestion can occur during the evacuation phase of a hurricane.

Vulnerability for Columbia County's Structures and Facilities

In the event of a hurricane or a severe tropical storm, the potential for damage to various buildings and civil structures is significant. This potential increases with various factors, such as the proximity of the storm event to the structure, age, construction quality, engineering, and materials used in construction.

Tables 4.13 – 4.16 summarize the following details for Columbia County on:

- the number of structures by occupancy type that would be affected by a Category 2 hurricane;
- the value of the structures by occupancy type that would be affected by a Category 2 hurricane;
- the county facilities by type that are located in the geographic areas expected to be affected every 20, 50, 100, 200 or 500 years by a Category 2 hurricane, and
- the value of the county facilities by type that are located in the geographic areas expected to be affected every 20, 50, 100, 200 or 500 years by a Category 2 hurricane.

Table 4.13 – Structures by Occupancy Type that would be affected by a Category 2 Hurricane in Columbia County

Return Period (years)	Residential	Commercial	Medical	Industrial	Agriculture	Education	Government
200	20,090	868	197	190	2,046	46	135

Source: State of Florida Enhanced Hazard Mitigation Plan, Page C.57

Table 4.14 – Values of Structures by Occupancy Type that would be affected by a Category 2 Hurricane in Columbia County

Return Period (years)	Residential ($ million)	Commercial ($ million)	Medical ($ million)	Industrial ($ million)	Agriculture ($ million)	Education ($ million)	Government ($ million)
200	3,631.60	842.98	242.52	416.86	433.28	301.70	335.56

Source: State of Florida Enhanced Hazard Mitigation Plan, Page C.62

Table 4.15 – Columbia County Facilities for Category 2 Hurricane Return Periods

Facility Type	20-Year	50-Year	100-Year	200-Year	500-Year
Fire Stations	0	0	0	5	0
Hospitals	0	0	0	3	0
Police Stations	0	0	0	7	0
Schools	0	0	0	20	0
Other Facilities	0	0	0	339	0

Source: State of Florida Enhanced Hazard Mitigation Plan, Page C.70

Table 4.16 –The Value of the Columbia County Facilities for Category 2 Hurricane Return Periods

Facility Type	20-Year ($ thousand)	50-Year ($ thousand)	100-Year ($ thousand)	200-Year ($ thousand)	500-Year ($ thousand)
Fire Stations	0	0	0	0	0
Hospitals	0	0	0	107,930	0
Police Stations	0	0	0	8,820	0
Schools	0	0	0	175,938	0
Other Facilities	0	0	0	0	0

Source: State of Florida Enhanced Hazard Mitigation Plan, Page C.78-79

Key Issues for Columbia County
Result of Flooding from a Hurricane or Tropical Storm

- *Callaway Subdivision*

Located off of SR 247 in Lake City, see Figure 4E above, portions of the subdivision were designated by the FEMA National Flood Insurance as flood Zone A. Many homes were flooded in 2004 as what was described as a 100-year event, and some of the homes were demolished and others had extensive renovations. In June 2012, Tropical Storm Debby affected Columbia County in just more than 48 hours bringing even more water into on the lowest areas in the Callaway Subdivision resulting in six feet of standing flood water.

Several weeks after the storm and in the wake of the flood waters left behind by Tropical Storm Debby, questions continue to surface about how the Callaway subdivision, an area apparently not on any critical flood zone maps, could be so easily destroyed when several retention ponds failed and water pooled as much as six feet deep in at least 10 homes for weeks. The SRWMD has established standards for stormwater retention ponds and drainage and requires that ponds are able to handle an inch of water per-hour, however, the rain from Tropical Storm Debby was far greater than the retention ponds were able to hold.

- *SR 47; CR 240; CR242; CR341*

Lake City residents travelled from Alligator Lake to the Ichtetucknee River by boat a century ago. Today, people take the same route, but it is called SR 47. Tributaries that flowed into the Ichetucknee River also have new names, including CR 240, 242 and 341. The river went underground many years ago, following a series of channels through the limestone, marked on the surface by springs and sinks. On rare occasions, the underground fills to capacity. Then the old riverbed once again becomes a river and the tributaries overflow with rainwater. People who own homes, businesses and farms are suddenly are in the midst of a flood.

- *The White Springs Area along the Suwannee River*

The Border of Columbia and Hamilton Counties, Suwannee River, the White Springs area that lies along the Suwannee River is the most prone to flooding.

Key Issues for Columbia County
Result of Wind Damage from a Hurricane or Tropical Storm

- *Columbia Countywide*

The entire county is extremely vulnerable to wind damage from a hurricane or tropical storm event due to a high concentration of the population residing in mobile homes, manufactured homes, or possibly poorly constructed homes which is approximately 36% +.

Summary details for hurricane and tropical storm events:

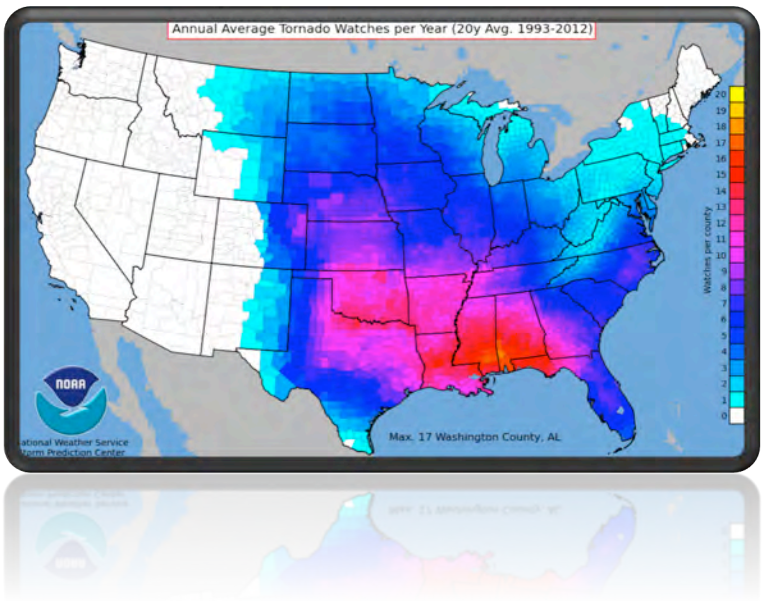
Probability	The probability of hurricane and tropical storm events is medium (at least 1 occurrence every 3 years).
Location	The entire planning area (the City of Lake City, the town of Ft. White, and unincorporated areas of Columbia County) is at medium to high risk to hurricane and/or tropical storm events. Columbia County is located inland and is not subject to storm surge, however, the entire county is very vulnerable to violent winds, heavy and widespread torrential rains, flooding, tornadoes, and lightning strikes which can come from hurricanes and tropical storm events. A hurricane or tropical storm, depending on the severity, could cause catastrophic damage and/or major disruptions to the critical infrastructure, critical facilities, the public and private buildings, some framed homes depending on zone location, and especially the mobile homes in the county. The recorded data for the number of mobile homes in the county is 7,400 +. These mobile homes located throughout the county are particularly vulnerable to violent wind damage, which could occur from a major hurricane or tropical storm.
Extent	The worse-case scenario for Columbia 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.
Impact	The Columbia County community, the residents, the county residential, commercial, public buildings, critical facilities, roadways, infrastructure, and systems can be impacted from hurricane and/or tropical storm events. The wind and water impacts associated with hurricanes or tropical storms can be disastrous 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 last major impact to Columbia County was Tropical Storm Debby in June 2012, and Hurricanes Frances and Jeanne in August and September 2004 that caused *millions of dollars in damages from flooding*. The economic effect or financial impact could be devastating from a large-scale hurricane or tropical storm event not only during the crisis phase, which immediately follows the event, but through the recovery and rebuilding stages. In addition, the effects would have an impact on agriculture, which might include loss of top livestock (cattle and calves), damage to top crops (forage-land used for hay and haylage, grass silage, and greenchop, peanuts for nuts, corn for grain, and cotton), there could be water contamination and increased susceptibility of livestock to disease.

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. 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.

Figure 4P – Tornado Map of the US (20-year Average, 1993 – 2012)



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

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 p.m. and 9 p.m., but can occur at any time.

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

The most common, least destructive tornadoes are warm weather tornadoes that occur between May and August. Cool season tornadoes are the most destructive, occurring between December and April.

Columbia 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.

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, Storm Prediction Center, the Enhanced Fujita Scale was implemented February 2007. The storm events database documentation notes that the Tornado EF Scale was based on the enhanced F-Scale. Details from NOAA's National Weather Service Storm Prediction Center on the Enhanced Fujita scale states it must continue to support and maintain the original tornado database and there must be some conformity to that of the F-Scale that is listed in the database. When using the EF-Scale to determine the tornado's EF-rating, begin with the 28 Damage Indicators (see Figure 4Q).

- ✓ Each one of these indicators has a description of the typical construction for that category of indicator.
- ✓ Then the next step is to find the Degree of Damage (DOD).
- ✓ Each DOD in each category is given and expected estimate of wind speed, a lower bound of wind speed and an upper bound of wind speed.

The Enhanced Fujita (EF) Scale is a set of wind estimates (not measurements) based on damage. Its uses three-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. See Figure N, the Enhanced F-Scale for specifics on tornado damage.

Figure 4Q – 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

Enhanced F Scale Damage Indicators

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 - jr. or sr. 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

Tornado or Funnel Cloud Occurrences

The NCDC (4/1/1950 – 4/30/2015) information reports that for the last 65 years there have been twenty-four tornado and funnel cloud events in Columbia County.

Table 4.17 – Tornado or Funnel Cloud Occurrences, Columbia County (4/1/1950 – 4/30/2015)

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
Columbia County	5/26/1951	12:30	Tornado		0	0	25K	0.00K

Columbia County	2/25/1960	5:30	Tornado	F3	0	0	250K	0.00K
Columbia County	5/29/1962	15:00	Tornado	F1	0	0	0K	0.00K
Columbia County	3/21/1974	11:30	Tornado	F2	0	1	25K	0.00K
Columbia County	2/12/1975	10:45	Tornado	F0	0	0	25K	0.00K
Columbia County	8/8/1975	15:45	Tornado	F1	0	2	2.5K	0.00K
Columbia County	8/20/1975	15:00	Tornado	F1	0	0	25K	0.00K
Columbia County	7/19/1977	15:30	Tornado	F0	0	0	2.5K	0.00K
Columbia County	1/23/1980	4:30	Tornado	F0	0	0	25K	0.00K
Columbia County	4/5/1982	18:00	Tornado	F1	0	1	25K	0.00K
Columbia County	4/23/1983	7:30	Tornado	F2	0	2	2.5M	0.00K
Columbia County	8/12/1986	15:15	Tornado	F0	0	0	0K	0.00K
Columbia County	7/23/1987	16:25	Tornado	F0	0	0	.25K	0.00K
Columbia County	9/5/1987	14:30	Tornado	F0	0	0	0K	0.00K
Columbia County	10/11/1990	13:50	Tornado	F0	0	0	0K	0.00K
Lake City	11/7/1995	20:57	Tornado	F1	0	0	500K	0.00K
Lake City	12/10/1997	7:20	Tornado	F0	0	0	5K	0.00K
Lake City	6/3/2003	13:20	Funnel Cloud	N/A	0	0	0K	0.00K
Lake City	11/5/2003	13:20	Funnel Cloud	N/A	0	0	0K	0.00K
Lake City	6/2/2004	16:55	Funnel Cloud	N/A	0	0	0K	0.00K
Lulu	12/25/2006	8:06	Tornado	F2	0	1	0K	0.00K
Lake City	3/7/2008	9:45	Tornado	EF2	1	5	4M	0.00K
Ellisville	5/29/2012	12:40	Funnel Cloud	N/A	0	0	0K	0.00K
Bass	5/15/2014	8:15	Tornado	EF1	0	0	0K	0.00K
Totals:							$7,410,000; 1 death; 12 injured	

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

Key Code: Mag: Magnitude; Dth: Deaths; Inj: Injuries; PdD: Property Damage;vCrD: Crop Damage

Significant property damage report detail

1) 4/23/1983 - Columbia – Gilchrist and Columbia counties are included in the total property damage figure. At Ft. White in Columbia County a brick home was destroyed. Also outbuildings were destroyed, mobile homes destroyed, trees and power lines blown down. Note: Two individuals were injured, details were not available.

2) 11/7/1995 – Lake City – One barn was destroyed with minor to moderate damage to 20 buildings.

3) 3/7/2008 – Lake City - NWS storm survey of the tornado track indicated most damage was EF1 scale with a small area of EF2 damage near NE Denver Street opposite a large field. Numerous trees and power lines were snapped or blown over by the storm. Truck and trailers were also blown over in an industrial park. 19 homes were destroyed, 21 suffered major damage, and 20 had minor damage. Two businesses were destroyed with six suffering major damage. One female fatality occurred when a tree went through her mobile home. A male indirect fatality occurred when trying to connect a power generator. The mesocyclone, which spanned this tornado was tracked across Taylor, Lafayette, and Suwannee counties prior to this touchdown and it later spanned tornadoes in Baker, Charlton and Nassau counties. Note: 5 individuals were injured, however, further details were not available.

Additional Tornado Occurrence Data – see image on right for the aftermath on the tornado

1) 12/25/2006 – Lake City – According to the Florida Highway Safety and Motor Vehicles statistical report on tornadoes in Lake City, on December 25, 2006 several narrow bands of thunderstorms moved northeast across the Florida panhandle through the early morning hours. A tornado developed near Lake City at approximately 8:00 am as the thunderstorms moved through the center of the state. One tornado developed northeast of Lake City at a subdivision with site built and manufactured homes. The F-2 tornado destroyed four homes and damaged over a dozen homes. Details were noted that there was one injury from this event. Property damage totals were not available.

Lake City Journal photos
Half of the home of Wayne and Karen Lewis (above) was torn to pieces by a tornado on Christmas morning. Nick and Amanda Vercher and their 2-year-old son were in their mobile home, next to the tree (below). They escaped without injury, but their home and car were destroyed.

Tornado track details

The Columbia County Sheriff said the damage was 500 yards wide, on a seven-mile path from U.S. 90, near the Plantations subdivision, to State Road 42 near Interstate 10, where a gas station was damaged.

Heavy rain, loud thunder and frequent lightning preceded the tornado. Chunks of debris were scattered on U.S. 90 West. Trees fell on houses in the Plantations subdivision. Steel roofing and walls exploded in all directions at Horizon Industries and nearby buildings as the tornado crossed Interstate 75. A trail of debris and broken trees show where the tornado entered the Woodborough subdivision and entered Lake Jeffery. Water was whipped high into the sky as the tornado churned through the lake, then hit the Lewis home on the north side. Power lines were damaged as the storm crossed Lake Jeffery Road, heading for the mobile homes in the Moore Haven area. On Moore Road, two semi trailers were knocked on their sides and an empty mobile home was demolished. Its roof hangs in a tree across the road were inside. Neighboring homes were hit with flying debris and falling trees. Along the path, some trees were snapped in half, next to rows of other trees that were uprooted. Seven miles from where it started, the tornado smashed into a gas station and disappeared into the sky. Shayne Morgan, Director of Emergency Management (*specialist at the time)* tracked the damage reports as they came in, and said there was only one injury requiring medical attention. Reports on downed power lines and trees that fell on houses and across roads. Fortunately, there were no fires. Workers responded quickly to repair damaged lines Christmas Day. A few miles southwest of them, where Lake City Avenue ends at Interstate 75, several large industrial buildings were shredded.

Vulnerability for Tornadoes

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. According to a new study by the University of North Carolina, Southeast Regional Climate Center, Florida is the most vulnerable state to tornadoes than any other state in the U.S., and leads the country in deaths related to tornadoes. The researchers found that Florida's death rate of 2.4 deaths per 100 miles of tornado is 2 ½ times more than that of Oklahoma and nearly 5 times of Kansas. This is because the increasing presence of mobile homes and a large elderly and poor population.

Columbia County is extremely vulnerable to these wind disasters due to a high concentration of the population residing in mobile homes, which is approximately 36%. The greatest area of vulnerability lies in rural areas of Columbia County because of the difficulty in warning the residents. Because of their speed of onset and unpredictability, immediate warning must be disseminated to inform residents to seek protective sheltering. These residents could include persons with special needs, elderly, farm workers, tourist population, and non-English speaking/hearing impaired, as well as transient visitors.

Vulnerability for the Columbia County's Population

Columbia County's growth rate from 2010 to 2015 was 1.3% to 68,377 residents. A tornado or a series of tornadoes could affect as many as 5,000+ residents if they should occur in a highly populated area of the county, and approximately 36% of the population live in mobile homes. The mobile home residents are more vulnerable than those that reside in a regular home. Also, most of the tornadoes in Florida occur at

night, which increases the risk as people are asleep and might miss the tornado warnings. *Over the last 65 years, Columbia County has had 1 death and 12 injuries due to tornado events.*

Vulnerability for Columbia County's Structures and Facilities

In the event of a tornado, the potential for damage to various buildings and civil structures is significant. This potential increases with various factors, such as the proximity of the storm event to the structure, age, construction quality, engineering, and materials used in construction.

The NCDC details reveal that Columbia County has been very vulnerable to property damage from 1950 to 2015, with the total figure of $7.4 million dollars. It is important to note that this figure consists of all types of property, however, it also buildings and structures.

The two most devastating and destructive tornadoes that affected the population and structures in Columbia were the following:

- ✓ In April of 1983, two were injured, a brick home was damaged, and several outbuildings and mobile homes were destroyed with an approximate property damage figure of $2.5 million (this damage figure is for Columbia and Gilchrist County). In addition power lines were blown down.

- ✓ In March of 2008, five were injured and one resident was killed (when a tree went through her mobile home), truck and trailers were blown over in an industrial park, 19 homes were destroyed, 21 suffered major damage, and 20 had minor damage. Two businesses were destroyed with 6 suffering major damage. The total property damage figure from this tornado event was $4 million.

Table 4.18 – Value of Structures by Occupancy Type that Vulnerable to Severe Thunderstorms (including Tornadoes) per Year in Columbia County

Thunderstorms (including tornadoes	Residential ($million)	Commercial ($million)	Medical ($million)	Industrial ($million)	Agriculture ($million)	Education ($million)	Government ($million)
9.5 - 17	66.40	1.07	3.37	0.16	39.18	0	2.33
17+	3,565.19	841.92	239.16	416.71	394.10	301.70	333.23

Source: State of Florida Enhanced Hazard Mitigation Plan, Page C.96

Key Issues for Columbia County
Result of Wind Damage from a Tornado

- *Columbia Countywide*

The entire county is extremely vulnerable to wind damage from a tornado event due to a high concentration of the population residing in mobile homes, manufactured homes, or possibly poorly constructed homes which is approximately 36% +.

Summary details for tornado events:

Probability	The probability of tornado is high (at least 1 occurrence every year).
Location	The entire planning area (the City of Lake City, the town of Ft. White, and unincorporated areas of Columbia County) is at high risk to tornado events. Most of the County is particularly vulnerable to tornados because of the presence of a high number of mobile homes (7,400 +), or approximately 36% as a percentage of the housing inventory and are located throughout the entire county.
Extent	The worse case scenario for Columbia 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 Columbia County was an EF2 on 3/7/2008. Numerous trees and power lines were snapped or blown over by the storm. Truck and trailers were also blown over in an industrial park. 19 homes were destroyed, 21 suffered major damage, and 20 had minor damage. Two businesses were destroyed with six suffering major damage. One female fatality occurred when a tree went through her mobile home. A male indirect fatality occurred when trying to connect a power generator.
Impact	The Columbia County community, the residents, the structures, the infrastructure, and the systems 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, public buildings, as well as the critical infrastructure such as transportation, water, energy, and communication systems. Mobile homes can be demolished, there can be wind damage to roofs, trees can split scattering tree debris which could impact transportation, power lines and emergency response services. And most importantly there could be bodily injury or a potential loss of life as noted on March 7, 2008 in Lake City. 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. Also, the effects could have a significant impact on agriculture. On March 7, 2008 and EF2 tornado hit Columbia County with over $4 million in property damage, 19 homes were destroyed, 21 suffered major damage, and 20 had minor damage. Two businesses were destroyed with six suffering major damage. One female fatality occurred when a tree went through her mobile home. A male indirect fatality occurred when trying to connect a power generator.

Thunderstorms - *(includes High Winds, Lightning and Hailstorms)*

Thunderstorm/Wind Events

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.

The moisture is necessary to produce the thunderstorm clouds and precipitation. In the summertime, most areas of the United States have sufficient moisture to generate thunderstorms if the other ingredients are present. In the wintertime, thunderstorms favor southern areas of the United States 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.

In the summertime, thunderstorms typically develop in the afternoon when the sun heats the air near the ground. If the atmosphere is unstable, bubbles of warm air will rise and produce clouds, precipitation, and eventually lightning.

A *severe thunderstorm* contains either hail one inch or greater and winds gusts in excess of 50 knots (57.5 mph), or a tornado. Thunderstorms have the potential of causing power outages and destruction or damage to buildings and can result in loss of life. Flash flooding from rainfall, fires from lightning, strong straight-line winds can knock down trees, mobile homes and tornadoes can be very destructive.

Thunderstorms facts:

- They may occur as single units, in clusters, or in lines.
- Some of the most severe occur when a single thunderstorm affects one location for an extended period of time.
- Thunderstorms typically produce heavy rain for a brief period, which can occur from 30 minutes to an hour, or longer.
- Warm and humid conditions are highly favorable for thunderstorm development.
- About 10% of thunderstorms are classified as severe—one that produces hail at least three-quarters of an inch or larger in diameter, has winds of approximately 58 miles per hour or higher, or spawns a tornado.

High 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.

Thunderstorm Occurrences

According to the NCDC, from 4/1/1950 to 4/30/2015, there have been 132 thunderstorms/wind events documented in Columbia County with a total property damage figure of $332,650.

Table 4.19– Thunderstorm/Wind Occurrences in Columbia County (4/1/1950 – 4/30/2015)

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
Columbia County	6/4/1969	15:30	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Columbia County	5/12/1974	04:30	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Columbia County	8/16/1974	14:40	Thunderstorm Wind	55 kts.	0	0	0.00K	0.00K
Columbia County	5/24/1980	15:00	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Columbia County	7/12/1980	17:30	Thunderstorm Wind	60 kts.	0	0	0.00K	0.00K
Columbia County	4/23/1983	08:08	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Columbia County	11/24/1983	16:20	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Columbia County	6/21/1984	17:30	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Columbia County	2/6/1986	08:45	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Columbia County	3/14/1986	04:05	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Columbia County	4/8/1989	21:00	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Columbia County	5/1/1989	12:01	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Columbia County	6/12/1989	14:00	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Columbia County	7/13/1989	12:00	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Columbia County	8/26/1989	14:14	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Columbia	11/23/1989	02:30	Thunderstorm	65	0	0	0.00K	0.00K

County			Wind	kts.				
Columbia County	5/28/1990	12:30	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Columbia County	6/30/1990	15:45	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Columbia County	9/9/1990	15:30	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Columbia County	9/11/1990	13:55	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Columbia County	3/3/1991	08:15	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Columbia County	7/8/1992	13:45	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Three River Estates	9/10/1993	17:45	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Lake City	6/24/1994	21:02	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Lake City	6/25/1994	12:02	Thunderstorm Wind	0 kts.	0	0	5K	0.00K
Columbia County	4/11/1995	20:45	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Mikesville	5/11/1995	11;45	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Lake City	5/12/1995	16:43	Thunderstorm Wind	0 kts.	0	0	0.15K	0.00K
GNV Lake City	7/5/1995	18:10	Thunderstorm Wind	0 kts.	0	0	2K	0.00K
GNV	7/10/1995	14:30	Thunderstorm Wind	0 kts.	0	0	1K	0.00K
GNV	7/10/1995	15:05	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
GNV	7/26/1995	18:10	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Lake City	8/15/1995	15:30	Thunderstorm Wind	0 kts.	0	0	1.50K	0.00K
Ft. White	8/25/1995	07:10	Thunderstorm Wind	0 kts.	0	0	0.50K	0.00K
Lake City	11/7/1995	20:20	Thunderstorm Wind	0 kts.	0	0	2K	0.00K
Lake City	11/11/1995	13:36	Thunderstorm	0 kts.	0	0	55K	0.00K

			Wind					
Lake City	5/27/1997	18:05	Thunderstorm Wind		0	0	0.50K	0.00K
Ft. White	8/30/1997	14:45	Thunderstorm Wind		0	0	0.50K	0.00K
Winfield	9/16/1997	17:43	Thunderstorm Wind		0	0	1.50K	0.00K
Lake City	2/16/1998	23:18	Thunderstorm Wind		0	0	1.50K	0.00K
Ft. White	4/19/1998	13:50	Thunderstorm Wind		0	0	2.50K	0.00K
Columbia County	4/19/1998	13:50	Thunderstorm Wind		0	0	2K	0.00K
Winfield	6/23/1998	14:45	Thunderstorm Wind		0	0	0.50K	0.00K
Lake City	6/25/1998	16:40	Thunderstorm Wind		0	0	1.50K	0.00K
Columbia County	6/25/1998	17:15	Thunderstorm Wind		0	0	15K	0.00K
Columbia County	6/29/1998	18:30	Thunderstorm Wind		0	0	3.50K	0.00K
Lake City	7/12/1998	13:00	Thunderstorm Wind		0	0	1.50K	0.00K
Lake City	8/3/1998	20:30	Thunderstorm Wind		0	0	2.50K	0.00K
Ft. White	9/3/1998	02:00	Thunderstorm Wind		0	0	1.50K	0.00K
Lake City	1/2/1999	21:30	Thunderstorm Wind		0	0	1.50K	0.00K
Lake City	1/23/1999	13:45	Thunderstorm Wind		0	0	1.50K	0.00K
Lake City	2/28/1999	07:05	Thunderstorm Wind		0	0	5K	0.00K
Lake City	5/10/1999	20:45	Thunderstorm Wind		0	0	1.50K	0.00K
Lake City	6/3/1999	18:45	Thunderstorm Wind		0	0	1.50K	0.00K
Lake City	8/1/1999	16:25	Thunderstorm Wind		0	0	15K	0.00K
Lake City	8/2/1999	20:24	Thunderstorm		0	0	3.50K	0.00K

			Wind					
Ft. White	1/24/2000	08:25	Thunderstorm Wind		0	0	1.50K	0.00K
Lake City	1/24/2000	08:56	Thunderstorm Wind		0	0	1K	0.00K
Lake City	2/14/2000	05:03	Thunderstorm Wind		0	0	3K	0.00K
Ft. White	2/27/2000	05:18	Thunderstorm Wind		0	0	2.50K	0.00K
Lake City	3/26/2000	16:00	Thunderstorm Wind		0	0	0.50K	0.00K
Ft. White	3/30/2000	15:00	Thunderstorm Wind		0	0	3.50K	0.00K
Lake City	3/30/2000	15:35	Thunderstorm Wind		0	0	5K	0.00K
Lake City	6/17/2000	18:30	Thunderstorm Wind		0	0	2.50K	0.00K
Lake City	7/20/2000	16:15	Thunderstorm Wind		0	0	5K	0.00K
Lake City	8/9/2000	17:20	Thunderstorm Wind		0	0	50K	0.00K
Ft. White	8/9/2000	17:30	Thunderstorm Wind		0	0	55K	0.00K
Lake City	8/19/2000	17:00	Thunderstorm Wind		0	0	2.50K	0.00K
Columbia County	8/25/2000	15:55	Thunderstorm Wind		0	0	2.50K	0.00K
Lake City	8/25/2000	16:30	Thunderstorm Wind		0	0	2K	0.00K
Lake City	3/29/2001	10:15	Thunderstorm Wind		0	0	10K	0.00K
Lake City	3/29/2001	10:30	Thunderstorm Wind		0	0	2.50K	0.00K
Lake City	3/29/2001	10:45	Thunderstorm Wind		0	0	15K	0.00K
Benton	6/12/2001	05:47	Thunderstorm Wind		0	0	4.50K	0.00K
Lake City	7/20/2001	15:44	Thunderstorm Wind		0	0	3.50K	0.00K
Lake City	3/31/2002	21:25	Thunderstorm		0	0	0.10K	0.00K

			Wind					
Lake City	4/17/2002	21:00	Thunderstorm Wind		0	0	1K	0.00K
Lake City	5/30/2002	16:45	Thunderstorm Wind		0	0	0.20K	0.00K
Lake City	6/5/2002	17:30	Thunderstorm Wind		0	0	1K	0.00K
Lake City	6/6/2002	15:15	Thunderstorm Wind		0	0	1K	0.00K
Lake City	7/3/2002	17:00	Thunderstorm Wind		0	0	2K	0.00K
Lake City	7/20/2002	13:55	Thunderstorm Wind		0	0	2K	0.00K
Lake City	7/30/2002	14:52	Thunderstorm Wind		0	0	2K	0.00K
Lake City	11/12/2002	11:30	Thunderstorm Wind		0	0	5K	0.00K
Lake City	5/18/2003	16:00	Thunderstorm Wind	55 kts.	0	0	0.00K	0.00K
Ft. White	5/18/2003	16:00	Thunderstorm Wind	55 kts.	0	0	0.00K	0.00K
Ft. White	5/19/2003	15:25	Thunderstorm Wind	55 kts.	0	0	0.00K	0.00K
Ft. White	6/2/2003	17:50	Thunderstorm Wind	55 kts.	0	0	0.00K	0.00K
Lake City	6/16/2003	15:36	Thunderstorm Wind	55 kts.	0	0	0.00K	0.00K
Winfield	6/2/2004	16:35	Thunderstorm Wind	55 kts.	0	0	0.00K	0.00K
Lake City	6/2/2004	16:35	Thunderstorm Wind	55 kts.	0	0	0.00K	0.00K
Lake City	6/2/2004	16:38	Thunderstorm Wind	55 kts.	0	0	0.00K	0.00K
Lake City	6/2/2004	17:00	Thunderstorm Wind	55 kts.	0	0	0.00K	0.00K
Lake City	6/3/2004	15:30	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Lake City	6/4/2004	18:30	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Lake City	6/19/2004	15:30	Thunderstorm	50	0	0	0.00K	0.00K

			Wind	kts.				
Lake City	6/29/2004	18:10	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Lake City	8/17/2004	22:00	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Lake City	5/28/2006	17:04	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Ft. White	5/28/2006	17:04	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Lake City	5/28/2006	17:30	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Lake City	6/28/2006	16:12	Thunderstorm Wind	48 kts.	0	0	1K	0.00K
Ft. White	7/27/2006	21:15	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Lake City	7/29/2006	19:05	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Lake City	8/21/2006	19:45	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Ft. White	1/5/2007	19:15	Thunderstorm Wind	50 kts.	0	0	5K	0.00K
Winfield	3/2/2007	04:00	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Winfield	3/2/2007	04:30	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Winfield	6/4/2007	16:40	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Winfield	7/27/2007	20:50	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Ellisville	7/28/2007	16:30	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Lake City	8/11/2007	19:55	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Bass	8/12/2007	16:20	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Watertown	2/26/2008	14:20	Thunderstorm Wind	52 kts.	0	0	0.00K	0.00K
Mason	2/26/2008	14:20	Thunderstorm Wind	52 kts.	0	0	0.00K	0.00K
Watertown	4/5/2008	12:35	Thunderstorm	50	0	0	0.00K	0.00K

			Wind	kts.				
Benton	6/2/2008	13:40	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Bass	6/9/2008	20:05	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Watertown	6/10/2008	14:45	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Suwannee Vly	7/22/2008	17:47	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Winfield	8/13/2008	13:00	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Lake City	4/2/2009	20:36	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Bass	6/18/2009	16:35	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Country Club Estates	1/21/2010	12:48	Thunderstorm Wind	55 kts.	0	0	0.00K	0.00K
Ft. White	4/30/2010	19:10	Thunderstorm Wind	61 kts.	0	0	0.00K	0.00K
Winfield	5/21/2010	19:00	Thunderstorm Wind	52 kts.	0	0	0.00K	0.00K
Winfield	5/30/2010	16:25	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Watertown	6/18/2010	15:25	Thunderstorm Wind	45 kts.	0	0	3K	0.00K
Five Pts	9/27/2010	11:27	Thunderstorm Wind	43 kts.	0	0	2K	0.00K
Watertown	4/5/2011	05:05	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Benton	5/14/2011	17:35	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Winfield	6/6/2011	14:57	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Lake City	6/6/2011	15:35	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Ft. White	8/20/2012	11:40	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Columbia County	12/26/2012	08:40	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K

Columbia County	2/26/2013	08:00	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Ellisville	2/26/2013	08:00	Thunderstorm Wind	60 kts.	0	0	0.00K	0.00K
Lake City	3/23/2013	12:08	Thunderstorm Wind	55 kts.	0	0	0.00K	0.00K
Bass	3/24/2013	08:47	Thunderstorm Wind	52 kts.	0	0	0.00K	0.00K
Lulu	6/30/2013	11:30	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Suwannee Vly	8/30/2013	19:06	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Lake City	9/11/2013	13:40	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Lake City	9/11/2013	13:45	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Five Pts	1/11/2014	16:06	Thunderstorm Wind	54 kts.	0	0	0.00K	0.00K
Winfield	5/11/2014	14:00	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Lake City	6/7/2014	00:00	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Ft. White	6/7/2014	00:22	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Mason	6/22/2014	15:30	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Ellisville	7/16/2014	17:47	Thunderstorm Wind	40 kts.	0	0	0.20K	0.00K
Ft. White	11/17/2014	12:24	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Country Club Estates	11/17/2014	12:24	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Bass	11/17/2014	12:24	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Lake City	11/17/2014	12:30	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Ft. White	2/26/2015	01:05	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Bass	4/13/2015	16:00	Thunderstorm	40	0	0	4K	0.00K

			Wind	kts.				
Ft. White	4/19/2015	15:00	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Lake City	4/19/2015	15:10	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
Total								Property Damage: $332,650

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

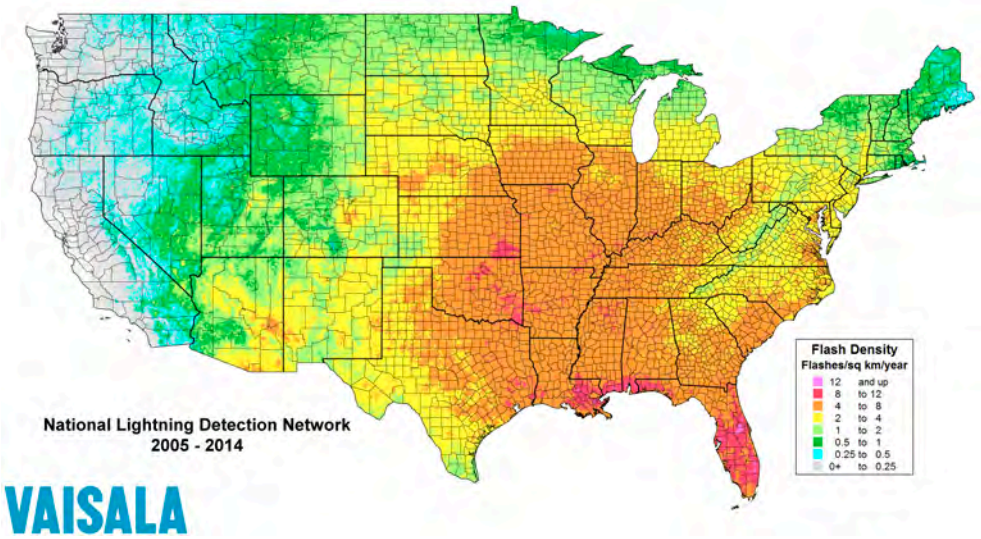
Lightning

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 is has the highest number of deaths from lightning strikes.

Figure 4R – Lightning Map (2005 – 2014)



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

The following are facts about lightning:

- Lightning's unpredictability increases the risk to individuals and property.
- 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.
- Most lightning deaths and injuries occur when people are caught outdoors in the summer months during the afternoon and evening.
- 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.
- Lightning strike victims carry no electrical charge and should be attended to immediately.

Lightning Occurrences

As recorded by the NCDC (4/1/1950 – 4/30/2015), there were seven recorded lightning events in Columbia County resulting in an injury for two individuals on 6/5/2001 and two deaths, one on 7/17/1996 and the other on 6/16/2003.

Table 4.20 – Lightning Occurrences in Columbia County (4/1/1950 – 4/30/2015)

Location or County	Date	Time	Type	Dth	Inj	PrD	CrD
Lake City	6/26/1996	22:00	Lightning	0	0	25K	0.00K
Ft. White	7/17/1996	15:00	Lightning	1	0	0K	0.00K
Lake City	6/5/2001	16:00	Lightning	0	2	0K	0.00K
Lake City	7/30/2002	14:53	Lightning	0	0	0K	0.00K
Ft. White	5/19/2003	14:25	Lightning	0	0	0K	0.00K
Lake City	6/16/2003	15:37	Lightning	1	0	0K	0.00K
Watertown	7/31/2013	14:30	Lightning	0	0	.50K	0.00K
Totals:	Property Damage; $25, 500						

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

Key Code: Dth: Deaths; Inj: Injuries; PdD: Property Damage;vCrD: Crop Damage

Significant property damage event details

1. 6/26/1996 – Lake City, more than ten suspect fires were caused by lightning.

2. 7/17/1996 – Ft. White, a 7-year old boy dies after being struck by lightning while he is playing at O'Leno State Park.

3. 6/16/2003 – Lake City, a 16-year old male was killed in a Toyota 4Runner eastbound on Baya Avenue when a lightning bolt stuck a large pine tree. The tree fell on his vehicle and the victim was struck and killed by a branch, which penetrated the front windshield.

Fires caused by Lightning

As stated in Table 4.24 from the Florida Forest Service, Fires by Causes, data reveals that over the last 14 ½ years lightning has contributed to 106 fires burning 4,765.90 acres in Columbia 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.

Hailstorm Occurrences

According to the NCDC, from 4/1/1950 to 4/30/2015, there have been 52 hailstorm events documented in Columbia County with approximately 38% of the hail recorded of 1-inch or over in diameter, the size of a quarter or considered severe.

Table 4.21– Hailstorm Occurrences in Columbia County (4/1/1950 –4/30/2015)

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
Columbia County	4/24/1967	17:20	Hail	1.00 in.	0	0	0.00K	0.00K
Columbia County	6/4/1969	15:30	Hail	1.75 in.	0	0	0.00K	0.00K
Columbia County	3/25/1982	20:45	Hail	1.75 in.	0	0	0.00K	0.00K
Columbia County	4/20/1991	20:30	Hail	1.75 in.	0	0	0.00K	0.00K
Columbia County	3/25/1992	14:10	Hail	.75 in.	0	0	0.00K	0.00K
Columbia County	4/15/1993	13:15	Hail	.75 in.	0	0	0.00K	0.00K
Lake City	5/12/1995	16:13	Hail	.75 in.	0	0	0.00K	0.00K
GNV	7/10/1995	13:30	Hail	.75 in.	0	0	0.00K	0.00K
Columbia County	8/30/1997	14:45	Hail	.75 in.	0	0	0.00K	0.00K
Lake City	2/22/1998	11:49	Hail	.88 in.	0	0	0.00K	0.00K
Lake City	4/8/1998	14:09	Hail	.75 in.	0	0	0.00K	0.00K
Lake City	6/28/1998	17:45	Hail	1.00 in.	0	0	0.00K	0.00K
Columbia County	6/29/1998	18:03	Hail	.75 in.	0	0	0.00K	0.00K
Lake City	1/18/1999	10:55	Hail	.75 in.	0	0	0.00K	0.00K
Columbia County	5/7/1999	10:40	Hail	.75 in.	0	0	0.00K	0.00K
Lake City	5/13/1999	19:15	Hail	.75 in.	0	0	0.00K	0.00K
Lake City	5/20/1999	16:30	Hail	1.75 in.	0	0	0.00K	0.00K
Five Pts.	4/24/2000	17:55	Hail	.75 in.	0	0	0.00K	0.00K
Lake City	5/22/2000	13:55	Hail	.75 in.	0	0	0.00K	0.00K

Mt. Carrie	7/30/2000	17:20	Hail	1.75 in.	0	0	0.00K	0.00K
Columbia County	5/12/2001	15:30	Hail	.88 in.	0	0	0.00K	0.00K
Ft. White	5/30/2001	15:31	Hail	.75 in.	0	0	0.00K	0.00K
Lake City	7/9/2001	19:55	Hail	.75 in.	0	0	0.00K	0.00K
Lake City	5/18/2003	15:25	Hail	2.00 in.	0	0	0.00K	0.00K
Lake City	6/1/2003	17:18	Hail	1.75 in.	0	0	0.00K	0.00K
Columbia County	6/2/2003	18:15	Hail	.75 in.	0	0	0.00K	0.00K
Lake City	6/2/2004	16:45	Hail	.88 in.	0	0	0.00K	0.00K
Lake City	6/29/2004	18:10	Hail	.75 in.	0	0	0.00K	0.00K
Suwannee Vly	3/25/2005	03:50	Hail	1.75 in.	0	0	0.00K	0.00K
Lake City	3/25/2005	09:34	Hail	.88 in.	0	0	0.00K	0.00K
Lake City	3/26/2005	16:00	Hail	.75 in.	0	0	0.00K	0.00K
Lake City	4/30/2005	18:00	Hail	1.25 in.	0	0	0.00K	0.00K
Lake City	6/21/2005	19:13	Hail	.88 in.	0	0	0.00K	0.00K
Lake City	2/3/2006	20:14	Hail	.88 in.	0	0	0.00K	0.00K
Ft. White	7/27/2006	19:30	Hail	1.00 in.	0	0	0.00K	0.00K
Ft. White	7/28/2006	18:15	Hail	1.00 in.	0	0	0.00K	0.00K
Lake City	6/2/2008	14:50	Hail	.75 in.	0	0	0.00K	0.00K
Winfield	6/9/2008	19:00	Hail	.75 in.	0	0	0.00K	0.00K
Lake City	6/18/2008	14:40	Hail	.75 in.	0	0	0.00K	0.00K
Lake City	6/18/2008	14:45	Hail	1.75 in.	0	0	0.00K	0.00K
Bass	7/12/2008	17:02	Hail	.88 in.	0	0	0.00K	0.00K
Lake City	4/2/2009	19:25	Hail	.75 in.	0	0	0.00K	0.00K
Ft. White	4/30/2010	19:12	Hail	1.00 in.	0	0	0.00K	0.00K
Suwannee Vly	5/22/2010	20:10	Hail	1.00 in.	0	0	0.00K	0.00K
Suwannee Vly	5/29/2010	17:00	Hail	.75 in.	0	0	0.00K	0.00K
Benton	5/14/2011	17:45	Hail	1.00 in.	0	0	0.00K	0.00K
Bass	6/6/2011	15:12	Hail	.75 in.	0	0	0.00K	0.00K
Ft. White	6/6/2011	16:00	Hail	1.00 in.	0	0	0.00K	0.00K
Lake City	3/23/2013	12:11	Hail	1.75 in.	0	0	0.00K	0.00K
Bass	5/25/2014	17:42	Hail	.75 in.	0	0	0.00K	0.00K
Bass	3/26/2015	15:15	Hail	1.00 in.	0	0	0.00K	0.00K
Five Pts.	3/26/2015	15:20	Hail	.88 in.	0	0	0.00K	0.00K
Totals:								N/A

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

Vulnerability for Thunderstorms, Lightning, and Hailstorms

Vulnerability to thunderstorms, lightning and hailstorm events can be defined as to the extent which people will experience harm and property will be damaged from the natural hazard. A severe thunderstorm contains either hail one inch or greater and winds gusts in excess of 50 knots (57.5 mph).

The entire County, the population, the structures and facilities are at risk and vulnerable to thunderstorm/wind, lightning and hailstorm events, especially the manufactured and mobile homes, which accounts for approximately 36% of the residential inventory, to wind and possibly hailstorm disasters.

The thunderstorm/winds have the potential of causing power outages and destruction or 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.

Vulnerability to life, land and structures can occur from a lightning occurrence. In 1996, a young boy died in Ft. White from a lightning strike while playing in a park. Also fires can spark and ignite from lightning and data from the last 14 ½ years reveals that lightning has contributed to 103 fires that have burned 4,759.8 acres of land in the County.

Over the last 65 years, Columbia County has had 132 thunderstorm/wind events with 62 of the thunderstorm/wind events (47%) that have caused property damage of $332,650. There were seven recorded lightning events resulting in two injuries and two deaths. And, there have been 52 hailstorm events, although no property damage was recorded.

The County should anticipate at least two + major thunderstorms and lightning occurrences that produce property damage every year and possible injury and at least one hailstorm event that might have the potential for damage.

Vulnerability for the Columbia County's Population

Columbia County's growth rate from 2010 to 2015 was 1.3% to 68,377 residents. The entire County population is vulnerable to severe thunderstorms.

Vulnerability for Columbia County's Structures and Facilities

Tables 4.22 – 4.23 identify the structures by occupancy type and value of the structures that are vulnerable to severe thunderstorm events.

Table 4.22 – Structures by Occupancy Type that Vulnerable to a Thunderstorm (including wind and hailstorms) Hazard per Year in Columbia County by the Number of Thunderstorms that affect that Area on an Average

Thunderstorms	Residential	Commercial	Medical	Industrial	Agriculture	Education	Government
9.5 – 17	497	3	8	1	187	0	6
17+	19,593	865	189	189	1,859	46	129

Source: State of Florida Enhanced Hazard Mitigation Plan, Page C.92

Table 4.23 – Value of Structures by Occupancy Type that Vulnerable to Severe Thunderstorms (including wind and hailstorms) per Year in Columbia County

Thunderstorms	Residential ($million)	Commercial ($million)	Medical ($million)	Industrial ($million)	Agriculture ($million)	Education ($million)	Government ($million)
9.5 - 17	66.40	1.07	3.37	0.16	39.18	0	2.33
17+	3,565.19	841.92	239.16	416.71	394.10	301.70	333.23

Source: State of Florida Enhanced Hazard Mitigation Plan, Page C.96

Key Issues for Columbia County
Result of Wind Damage from a Thunderstorm/Wind Event

- *Columbia Countywide*

The entire county is extremely vulnerable to wind damage from a thunderstorm/wind event due to a high concentration of the population residing in mobile homes, manufactured homes, or possibly poorly constructed homes which is approximately 36% +.

Summary details for thunderstorm/wind, lightning and hailstorms events:

Probability	The probability for thunderstorms with high winds, lightning, and hailstorm events is high (at least 1 occurrence every year).
Location	The entire planning area (the City of Lake City, the Town of Ft. White, and unincorporated areas of Columbia County) is at high risk to thunderstorm/wind, lightning and hailstorm events. Each jurisdiction had documented thunderstorm/wind events with property damage (i.e. unincorporated Columbia, the City of Lake City, and the Town of Ft. White). The entire County is particularly vulnerable to thunderstorm/wind, lightning and

	hailstorm events because of the presence of a high number of mobile homes (7,400 +) or approximately 36% as a percentage of the housing inventory. Mobile homes are particularly vulnerable to the impacts of these events because of their construction and that they are located throughout the entire county.
Extent	The worse-case scenario for Columbia 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. See specific details below. Columbia County Data: *Thunderstorms/Wind* The magnitude extent was 65 kts (approximately 75 miles per hour), which occurred on 11/23/1989. The narrative reveals that two large trees were uprooted and there was damage to a house roof. *Lightning* According to the light density map, see figure 4R, and the Columbia County Department of Emergency Management, the extent would be 4 to 8 flashes/sq km/year for the County. *Hailstorms* The magnitude extent was 2 inches, a severe hailstorm, (approximately the size of a hens egg), which occurred on 5/18/2003. The narrative reveals that hail covered the backyard and several large limbs were down.
Impact	The Columbia County community, the residents, structures, and the infrastructure, could 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 $55,000 on two recorded events: On 11/11/1995 in Lake City, trees were blown across US 90 East and across Hwy. 47 South of CR 240. One home was left in shambles and was almost totally destroyed. On 8/9/2000 in Ft. White, eight homes and one vehicle was damaged. As noted, wind damage can damage buildings, trees, and the infrastructure within the county.

	Lightning Lightning can be dangerous and deadly. From January 2000 to July 2015, lightning caused 106 wildfires and burned over 4,755.90 acres. And, unfortunately, Columbia County has had a death caused by a lightning strike. The impact and suffering of a loss of life was unimaginable for all the when a young boy was struck by lightning while playing at O'Leno State Park and died in Ft. White on 7/17/1996. *Hailstorms* Although no specifics on property damage were available according to the NCDC, large hailstorm events can produce significant property damage to the structures and crops in the county. In addition, the economic effect or financial impact the effects could have a significant impact on agriculture from a devastating severe thunderstorm/wind, or lightning and/or hailstorm event.

Erosion - *(including Riverine Erosion)*

Erosion is the removal of soil, sediment, regolith, and rock fragments from the landscape. Most landscapes show obvious evidence of erosion. Erosion is responsible for the creation of hills and valleys. It removes sediments from areas that were once glaciated, shapes the shorelines of lakes and coastlines, and transports material downslope from elevated sites.

In order for erosion to occur three processes must take place: detachment, entrainment and transport. Erosion also requires a medium to move material (i.e. wind, water, and ice are the mediums primarily responsible for erosion). Finally, the process of erosion stops when the transported particles fall out of the transporting medium and settle on a surface. This process is called deposition.

Human intervention's removal of natural vegetation for farming or grazing purposes can lead to or accelerate erosion by wind and water. Moving water is the most likely natural agent of erosion. The erodibility is influenced by many factors, some of which vary during the year and/or vary with soil management.

Water erosion is caused when raindrops falling on bare or sparsely vegetated soil detach soil particles, and the water flow over the ground picks up the particles and carries them. As the runoff gains velocity, it forms channels and detaches more soil particles. This action cuts rills and gullies into the soil, adding to the sediment load.

Wind erosion is a major hazard on the sandy soils as strong winds can damage soils and tender crops in a few hours in the open and unprotected areas where the soil is dry and bare. Wind erosion can reduce the soil fertility by removing the finer soil particles and organic matter. The damages of crops by sandblasting can spread disease and can create a health hazard.

Soil erosion is a problem on about ¾ of the cropland and pasture area in the unincorporated area of Columbia County. If the slope is more than 2%, erosion is a hazard, especially in areas of the well drained and moderately well drained Bonneau, Chiefland, Blanton, and Goldsboro soils, and the somewhat poorly drained Ocilla and Albany soils, and the poorly drained Pelham and Plummer soils. Loss of the surface layer through erosion is damaging as productivity is reduced and part of the subsoil is incorporated into the plow layer, and the soil erosion on farmland results in sediment entering the streams.

The erosion control practices provide for a protective surface cover, reduce runoff, and can increase the rate of infiltration. A cropping system that can keep vegetative covers on the soil for extended periods of time can reduce the erosion losses to amounts that will not reduce the productive capacity of the soils. In addition, diversions and sod waterways also reduce runoff and erosion can be adapted to most soils in the County.

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.

Riverine 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.

According to the Suwannee River Water Management District

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 very difficult to determine an extent on riverine erosion as it depends upon the location and possible curvature and the variation of the Suwannee River. Most of the time, property owners who live near the riverbank contact the SRWMD office and report erosion from the riverbank, which could be several feet and have occurred over a number of years. They request a permit application to repair and mitigate the riverbank so that it won't get worse. If the property owner doesn't have a survey to evaluate the erosion, it is impossible to measure the depth of the erosion.

The riverine erosion evaluation also depends on the type of hazard event that has occurred and the year. A worst-case scenario would be tree limbs, logs, a dock, a deck, a structure, vegetation, or obstruction washes into the river possibly causing a bridge or road to erode and wash out. It is important to note that the Suwannee River doesn't move a lot and therefore there is minimal riverine erosion.

Erosion and Riverine Erosion Occurrences

Although soil erosion is a problem on about ¾ of the cropland and pasture area in the unincorporated area of Columbia County, there was no *specific data on historical occurrences recorded of significant erosion* in the County.

There is *no recorded history of significant riverine erosion events* along the rivers, lakes or streams in the unincorporated areas within the county. This can be contributed for any structures due to the setback requirements in the land use element in the COMP.

> As stated in Part II, Columbia County Comprehensive Plan, Section I, Future Land Use Element, Policy I 1.6, 3 The development shall provide a minimum of a 200- foot buffer from adjacent properties, 75-foot undisturbed buffer from a perennial river, stream or creek and a minimum 50-foot setback from a lake, pond or wetland. This buffer may be a portion of the required undeveloped area.

Vulnerability for Erosion and Riverine Erosion

Vulnerability to erosion and riverine erosion events can be defined as to the extent to which people will experience harm and property will be damaged from the natural hazard.

The vulnerability of soil erosion is a problem on about ¾ of the cropland and pasture area in the unincorporated area of Columbia County, which could have an impact to the crop from water or wind erosion events. If the slope is more than 2%, erosion is a hazard, especially in areas of the well drained and moderately well drained Bonneau, Chiefland, Blanton, and Goldsboro soils, and the somewhat poorly drained Ocilla and Albany soils, and the poorly drained Pelham and Plummer soils. Loss of the surface

layer through erosion is damaging as productivity is reduced and part of the subsoil is incorporated into the plow layer, and the soil erosion on farmland results in sediment entering the streams.

The vulnerability of riverine erosion along the rivers, lakes or streams would and does occur in the unincorporated areas within the county. It is very difficult to determine riverine erosion as it depends upon the location and possible curvature and the variation of the Suwannee River or Santa Fe Rivers. 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 the Columbia County's Population

The unincorporated areas of the county population located on agricultural property are vulnerable to erosion events. The unincorporated areas of the county population that live close to the Suwannee or Santa Fe Rivers are vulnerable to riverine erosion and as noted above might have limited access to a bridge or road that erodes or washes out.

Vulnerability for Columbia County's Structures and Facilities

The vulnerability for erosion events would be the agricultural structures located on slope locations that are built on more than 2% slope of the land. The vulnerability for riverine erosion events would be homeowners that have property and structures located on the riverbeds and suffer from a historical river flooding elevation event that wash outs the structures.

Key Issues for Columbia County

The soil erosion is a problem on about ¾ of the cropland and pasture area in the unincorporated area of Columbia County, which could have an impact to the crop from water or wind erosion events.

The riverine erosion along the rivers, lakes or streams would and does occur in the unincorporated areas within the county along the Suwannee River or 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.

Summary details for erosion and riverine erosion events:

Probability	The probability for erosion is medium (at least 1 occurrence every 3 years). The probability for riverine erosion is low (at least 1 occurrence every 10 years).
Location	*Erosion* Soil erosion is a problem on about ¾ of the cropland and pasture area in the

	unincorporated area of Columbia County and these areas are at medium risk to erosion events. There are 101,451 acres of farmland in Columbia County according to the 2012 Census of Agriculture. That accounts for approximately 20% of the total acreage in the county. *Riverine Erosion* The unincorporated area of Columbia County would be at low risk to riverine erosion event. The area location would be along the Suwannee River, Santa Fe River, Olustee Creek and the Ichetucknee River.
Extent	*Erosion* If the slope of the land is more than 2%, erosion is a hazard, especially in areas of the well drained and moderately well drained Bonneau, Chiefland, Blanton, and Goldsboro soils, and the somewhat poorly drained Ocilla and Albany soils, and the poorly drained Pelham and Plummer soils. Loss of the surface layer through erosion is damaging as productivity is reduced and part of the subsoil is incorporated into the plow layer, and the soil erosion on farmland results in sediment entering the streams. See Figure 4S for acreage and proportionate extent of the soils in Columbia County. Based on the quantitative measurement for erosion, the worse case scenario would be a severe hurricane or tropical storm event that would result in heavy rain and thunderstorms for a short duration causing a high-intensity storm specifically if the slope of the land is more than 2% and on the identified soils noted above. *Riverine Erosion* According to the SRWMD: "It is very difficult to determine an extent on riverine erosion as it depends upon the location and possible curvature and the variation of the Suwannee and Santa Fe Rivers. Most of the time, property owners who live near the riverbank contact the SRWMD office and report erosion from the riverbank, which could be several feet and have occurred over a number of years. They request a permit application to repair and mitigate the riverbank so that it won't get worse. If the property owner doesn't have a survey to evaluate the erosion, it is impossible to measure the depth of the erosion. In addition, it also depends on the type of hazard event that has occurred and the year. A worst-case scenario would be tree limbs, logs, a dock, a deck, a structure, vegetation, or obstruction washes into the river possibly causing a bridge or road to erode and wash out."

Impact	*Erosion* Soil erosion is a problem on about ¾ of the cropland and pasture area in the unincorporated area of Columbia County and these areas are at medium risk to erosion events. The impact results could be considerable erosion to the soil and damage the county's top crops (i.e. forage-land use for all hay and haylage, grass silage, and greenchop, peanuts for nuts, corn for grain, cotton and upland cotton), and if adequate legume and grass forage is not properly planted than the impact of severe hazard event could decimate the pastures, hay and the following crops. The Columbia County agricultural community and the residents could suffer from a damaging erosion event. With over 945 farms in the county and a market value of the agricultural products (crop and livestock) sold of: $108,574,000 (data recorded from the 2012 Census of Agriculture), the effect could be considerable loss in revenue for the county. Also, wind erosion can reduce the soil fertility by removing the finer soil particles and organic matter and the damages of crops by sandblasting can spread disease and can create a health hazard to the county's population. Control of erosion minimizes the pollution of streams by sediment and improves the quality of water for the municipal and recreation use, and for the fish and wildlife. On the livestock farms in the county, which require pasture and hay, the legume and grass forage crops can reduce erosion on the sloping land and also provide nitrogen and improve tilth for the following crops. *Riverine Erosion* The Columbia County communities living near the Suwannee River, Ichetucknee River or Santa Fe River could be impacted if a bridge collapsed and residents were unable to use the bridge or roads for transportation.

Figure 4S – Acreage and Proportionate Extent of the Soils in Columbia County

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
1	Albany fine sand, 0 to 5 percent slopes	25,385	5.0
2	Albany fine sand, occasionally flooded	623	0.1
3	Alpin fine sand, 0 to 5 percent slopes	17,610	3.5
4	Alpin fine sand, 5 to 12 percent slopes	971	0.2
5	Alpin fine sand, occasionally flooded	95	*
6	Arents, 0 to 5 percent slopes	118	*
7	Bigbee fine sand	2,465	0.5
8	Blanton fine sand, 0 to 5 percent slopes	56,731	11.3
9	Blanton fine sand, 5 to 8 percent slopes	3,090	0.6
10	Blanton fine sand, occasionally flooded	1,758	0.3
11	Blanton-Bonneau-Ichetucknee complex, 2 to 5 percent slopes	6,062	1.2
12	Blanton-Bonneau-Ichetucknee complex, 5 to 8 percent slopes	1,147	0.2
13	Bonneau fine sand, 2 to 5 percent slopes	32,563	6.5
14	Bonneau fine sand, 5 to 8 percent slopes	3,202	0.6
15	Bonneau-Blanton complex, 2 to 5 percent slopes	7,802	1.6
16	Bonneau-Blanton complex, 5 to 8 percent slopes	377	0.1
17	Chiefland-Pedro Variant complex, 0 to 5 percent slopes	3,153	0.6
18	Chiefland-Pedro Variant complex, 5 to 8 percent slopes	302	0.1
19	Chiefland-Pedro Variant complex, occasionally flooded	498	0.1
20	Chipley fine sand, 0 to 5 percent slopes	7,311	1.5
21	Dorovan muck	2,473	0.5
22	Electra Variant fine sand, 0 to 5 percent slopes	1,244	0.2
23	Electra Variant fine sand, occasionally flooded	814	0.2
24	Fort Meade Variant loamy fine sand, 0 to 5 percent slopes	182	*
25	Goldsboro loamy fine sand, 2 to 5 percent slopes	1,250	0.2
26	Hurricane fine sand	4,751	0.9
27	Ichetucknee fine sand, 2 to 5 percent slopes	2,788	0.6
28	Ichetucknee fine sand, 5 to 8 percent slopes	718	0.1
29	Lakeland fine sand, 0 to 5 percent slopes	17,011	3.4
30	Lakeland fine sand, 5 to 12 percent slopes	387	0.1
31	Leefield fine sand	631	0.1
32	Leon fine sand	5,486	1.1
33	Leon fine sand, occasionally flooded	491	0.1
34	Lucy loamy fine sand, 2 to 5 percent slopes	995	0.2
35	Lucy loamy fine sand, 5 to 8 percent slopes	254	0.1
36	Mandarin fine sand	620	0.1
37	Mascotte fine sand	67,569	13.4
38	Mascotte fine sand, depressional	2,162	0.4
39	Mascotte fine sand, occasionally flooded	1,417	0.3
40	Ocilla fine sand, 0 to 5 percent slopes	13,000	2.6
41	Oleno clay	2,021	0.4
42	Olustee fine sand, thick surface	30,914	6.1
43	Orangeburg loamy fine sand, 2 to 5 percent slopes	826	0.2
44	Orangeburg loamy fine sand, 5 to 8 percent slopes	685	0.1
45	Pamlico muck, loamy substratum	13,009	2.6
46	Pamlico, loamy substratum-Dorovan complex	2,050	0.4
47	Pantego fine sandy loam	1,173	0.2
48	Pelham fine sand	14,709	2.9
49	Pelham fine sand, occasionally flooded	1,071	0.2
50	Pits	457	0.1
51	Plummer fine sand	9,751	1.9
52	Plummer fine sand, depressional	6,430	1.3
53	Plummer fine sand, occasionally flooded	4,835	1.0
54	Plummer muck, depressional	10,017	2.0
55	Plummer, depressional-Pamlico, loamy substratum complex	25,958	5.2
56	Sapelo fine sand	30,529	6.1
57	Surrency fine sand	40,783	8.1
58	Surrency fine sand, occasionally flooded	3,630	0.7
59	Troup fine sand, 2 to 5 percent slopes	4,916	1.0
60	Troup fine sand, 5 to 8 percent slopes	254	0.1
61	Udorthents, 0 to 2 percent slopes	510	0.1
	Water	3,006	0.6
	Total	503,040	100.0

* Less than 0.1 percent.

Source: US Department of Agriculture, Soil Conservation Service, Soil Survey of Columbia County Florida

Wildfire

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 – 7/6/2015)

Table 4.24 reports statistics from the Florida Forest Service, Fires by Causes, over the last 15 ½ years

reveals that 1,040 fires occurred burning over 50,245.9 acres In Columbia County. The acreage data is somewhat imbalanced due to a *prescribed fire called the Impassable fire*, which occurred in March 2004 became a wildland fire that grew to approximately 34,318.4 acres, see details on this fire below.

Table 4.24 – Fires by Causes
Columbia County (1/1/2000 – 7/6/2015)

Cause	Fires	Percent	Acres	Percent
Campfire	16	1.54	38.7	0.08
Children	41	3.94	60.1	0.12
Debris Burn *	120	11.54	502.1	1.00
Debris Burn – Authorized Broadcast/Acreage	19	1.83	34,318.4 - **	68.30
Debris Burn – Authorized – Piles	20	1.92	138.7	0.28
Debris Burn – Authorized – Yard Trash	110	10.58	200.5	0.40
Debris Burn – NonAuthorized Broadcast/Acreage	27	2.60	151.9	0.30
Debris Burn – NonAuthorized – Piles	52	5.00	147.3	0.29
Debris Burn – NonAuthorized – Yard Trash	91	8.75	314.2	0.63
Equipment Use *	38	3.65	89.2	0.18
Equipment – Agriculture	23	2.21	405.6	0.81
Equipment – Logging	5	0.48	1.6	0.00
Equipment – Recreation	3	0.29	2.5	0.00
Equipment – Transportation	12	1.15	65.2	0.13
Incendiary	61	5.87	2,429.4	4.84
Lightning	106	10.19	4,765.9	9.49
Misc. – Breakout	7	0.67	141.2	0.28
Misc. – Electric Fence	2	0.19	95	0.19
Misc. – Fireworks	7	0.67	17.9	0.04
Misc. - Power Lines	37	3.56	81.7	0.16
Misc. – Structure	4	0.38	0.8	0.00
Misc. – Other	70	6.73	237	0.47
Railroad	5	0.48	377.9	0.75
Smoking	10	0.96	18.8	0.04

Unknown	154	14.81	5,644.3	11.23
Total	1040		50,245.9	

Source Florida Forest Service: http://tlhforweb03.doacs.state.fl.us/PublicReports/FiresByCause.aspx

* Fire cause no longer used

** Impassable Fire details

> According to the report prepared by the Osceola Ranger District, National Forests in Florida Compartments 16 and 117, Escaped Fire Review …"On March 2, 2004, a prescribed fire was ignited in Compartments 16 and 117 of the Osceola Ranger District, National Forests of Florida. Statements indicate the fire burned outside the parameters of the burn plan within hours of initial ignition. On March 7, 2004, at 8:21 pm the fire was declared an escaped burn moving from the prescribed area onto Florida Division of Forestry (DOF) lands. The *planned 1,500-acre prescribed fire became a wildland fire that grew to approximately 34,200 acres* across federal, state, and private lands."

A review team was assembled to determine the factors that led to the escape and analysis revealed that the planning and implementation of the prescribed fire as implemented (combining Compartments 16 and 117 into one prescribed burn) were not in compliance with Forest Service standards and procedures.

Wildfire Occurrences

According to the NCDC, there were eleven wildfire occurrences reported in Columbia County with location, date, time, the type of event, if there were any deaths or injuries, and the property and crop damage estimates.

Table 4.25 – Columbia County Wildfires (1950 –7/1/12015)

Location or County	Date	Time	Type	Dth	Inj	PrD	CrD
Lake City	7/10/1998	00:01	Wildfire	0	4	0.00K	0.00K
Countywide	4/14/1999	16:00	Wildfire	0	0	0.00K	0.00K
Countywide	4/25/1999	11:00	Wildfire	0	0	0.00K	0.00K
Countywide	5/3/1999	11:00	Wildfire	0	1	0.00K	0.00K
Countywide	5/4/1999	11:00	Wildfire	0	0	0.00K	0.00K
Countywide	5/12/1999	12:00	Wildfire	0	0	0.00K	0.00K
Countywide	5/18/1999	12:00	Wildfire	0	0	0.00K	0.00K
Columbia (Zone)	5/8/2007	13:00	Wildfire	0	0	10.600 M	0.00K
Columbia (Zone)	6/1/2011	00:00	Wildfire	0	0	0.00K	0.00K

Columbia (Zone)	7/1/2011	00:01	Wildfire	0	0	0.00K	0.00K
Columbia (Zone)	5/6/2012	07:00	Wildfire	0	0	0.00K	0.00K
Total	$10,600,000; 10 injured						

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

Key Code: Dth: Deaths; Inj: Injuries; PdD: Property Damage; CrD: Crop Damage

Significant property damage report detail

1) 5/8/2007, Columbia Zone – Lightning strikes on May 5 ignited two 11-acre and 21 acre fires on Bugaboo Island in the southern Okefenokee National Wildlife Refuge (southwest of Stephen Foster State Park). On the 8th through the 10th high winds around large coastal low pressure system quickly resulted in extreme fire spread in southern Ware and Clinch counties in Southeast Georgia (the Bugaboo Scrub Fire).

   The fires combined and raced southward toward Baker and Columbia counties in north Florida becoming the Florida Bugaboo Scrub Fire. Due to close proximity to large populated areas, most significantly Lake City, Florida the fire generated large media attention and became the dominant fire between Bugaboo Scrub complexes. In the evening on the 8th, Georgia St. Rd 94 and Florida St. Rd 2 (one road with two designations) were closed from Moniac to Fargo, Georgia due to the threat of the Bugaboo Scrub fire crossing and St. Rd 2's poor visibility because of smoke in the area. By 4 pm, 500 people were evacuated from the vicinity of Taylor, Florida in northern Baker County and others were evacuated near Moniac, Georgia.

   The focus the fire fighting efforts from May 8 – May 10 was on structure protection the Taylor and Baxter, Florida area. Fire crews, along with private timber companies, were working along the flanks of the fire where conditions allowed, as well as, working to protect structures. Fire crews and forest industry personnel were also strengthening lines on the SW edge of the Georgia Bugaboo Scrub near Fargo. The Southern Area Blue Team assumed responsibility of the Florida Bugaboo Scrub Fire, South of St. Rd 2 on May 10. At this point the fire had burned nearly 26,746 acres.

   From May 10 to May 13, the fire burned SW toward Deep Creek and Lake City in Columbia County causing evacuations in those areas and sporadic closings of I-10 and I-75 in the area. By May 13, the Florida Bugaboo Scrub Fire had burned 102,000 acres and Georgia Bugaboo had burned 131,718 acres, the total for both were 233,718 acres and 570 persons were forced from their homes. Smoke from these large fires produced hazy conditions as far south as Miami over the weekend. On May 14, around 4 pm, the fire jumped containment line in the Fairview Road was of US 441, about five miles N of the Deep Creek community but was contained overnight. At this time the fire was considered to be 50% contained. On May 15, a critical day for firefighters as wind gusted to 18 mph, with low humidity and higher temperatures making containing the fire more

difficult.

The fire was located about 8 miles N of I-10 and 1/5 miles E of US Hwy 441. While no homes were damaged or destroyed, the fire burned to within a mile of the closest home located on Omar Terrace, about a mile E of US 441 and the Deep Creek community. At this point, there are some 300 homes were evacuated affecting approximately 1,000 people, with 48 structural fire units were situated around 350 homes in the immediate area of the fire to prevent loss. By that evening, the Florida portion of the Bugaboo Fire had increased to 119,501 acres and was 50% contained. After this point, the fire remained within containment with burnout operations continuing around the perimeter through the remainder of the month. Rains from Tropical Storm Barry (6/1 – 6/2) aided with fire control efforts.

Note: All Types of Fires by Causes from the Florida Forest Service for Columbia County from (1/1/2000 – 7/6/2015) are noted in Table 4.24. In reference to Table 4.25, there are no additional wildfire occurrences noted after May 2012 on the NCDC database or specifics related to wildfires in the County on the Florida Forest Service website.

Consequences of a Wildfire

A noted earlier, in table 4.24, 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 4.26.

Table 4.26 - Consequences of Wildfire

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

Prevention

- 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 Columbia 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 an communities) can be designed, built and maintained to withstand a wildland fire without the intervention of a fire department.
  - ✓ Columbia County addresses issues relating to firewise communities in the newly created Community Wildfire Protection Plan (CWPP).
- Columbia County Department of Emergency Management provides information on their website for the county citizens about the fire facts and having a firewise home.
- 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."

Effective June 2015, Columbia County has recently established their CWPP. Located in Appendix II, 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 Columbia 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 CWPP 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).

Columbia County's recommended FAC activities will be collaboratively developed and include the following examples:

- ✓ Adopt and implement planning and zoning measures to reduce risk to communities from wildfire.
- ✓ Align public investments in fuels treatments to demonstrable risk reduction activities by communities and landowners.
- ✓ Utilize fuels management programs to address protection of communities and their values.
- ✓ Encourage communities and landowners to actively manage land for fuels reduction.
- ✓ Examine and develop solutions to better utilize grant programs that address community, homeowner and volunteer capacity for fire mitigation efforts and activities for risk reduction.
- ✓ Reduce human caused ignitions.
- ✓ Engage non-traditional partners, such as the insurance industry and non-governmental organizations, in efforts to promote Fire Adapted Communities.

In addition the CWPP addresses the Fire Adapted Communities, the CWPP Goals and Objectives, and the Actions for:

- ➢ Community Outreach and Education,
- ➢ Firewise Communities, Building Retrofit and Landscaping
- ➢ Policy and Regulation Recommendations and
- ➢ Wildland Fire Response Improvements

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 Columbia 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.

Vulnerability for Wildfires

Vulnerability to wildfire events can be defined as to the extent to which people will experience harm and property will be damaged from the natural hazard. Typically the County sees the greatest number of wildfires occurring during the months of April, May and June. Columbia County is very vulnerable to wildfires due to the extent of forestry, conservation and agricultural land. Columbia County has 228,867 acres of forest or private timber company land. Any type of drought condition would augment the possibility of a major forest fire thereby significantly impacting the county.

Columbia County is subject to numerous wild land and forest like fires as a large percentage of the county is planted pinelands and open rural areas. Although Columbia County Fire Department responds to many wild land (brush) fire calls annually property losses are kept to a minimum.

The last large wild land fire occurred during the Bugaboo Fire in May 2007 where several thousands of acres of planted pines were destroyed causing an estimated $200,000 in damage. In 2013 wild land fires caused approximately $30,000 in property damage with 95% percent covered by insurance.

Bugaboo Fire
The Columbia County community, the residents, the structures, and the infrastructure suffered from the Bugaboo Fire. Based on the data recorded from the "Significant Wildfires in Florida 1981 – 2008", the impact from the Bugaboo wildfire that burned 123,014 acres in Baker and Columbia counties caused over $10 million in property damage in Columbia County, road closures due to smoke and visibility and evacuations for some of the county residents.

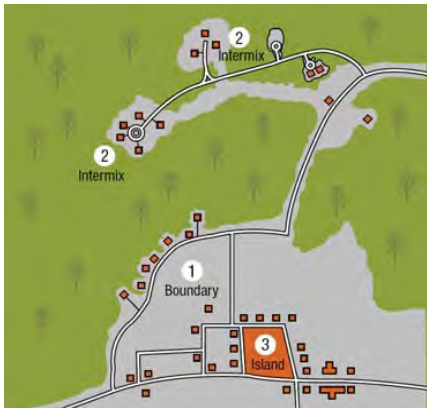
CWPP
According to the CWPP, the Wildland Urban Interface (WUI) is defined in the National Fire Plan as the area where houses and wildland vegetation coincide. Inclusive would be WUI buffers of 1.5 miles around actual places where people live as well as significant infrastructure, gas pipeline locations and major evacuation routes.

The WUI is a set of conditions that can exist and make a community and its infrastructure vulnerable to a wildfire disaster. These conditions can include the amount, type, and distribution of vegetation, the flammability of the structures (homes, businesses, outbuildings, decks, fences) in the area, and their proximity to fire-prone vegetation and to other combustible structures; weather patterns and general climate

conditions; topography; hydrology; average lot size; and road construction. Every year in Florida, an average of 3,200 wildfires burn nearly 130,000 acres; with residential and commercial structures either damaged or threatened 80% of the time. This makes WUI CPZ focal areas for human-environment conflicts such as wildland fires. *For Columbia County, it is estimated 96%+ of the total population of 68,377 live within the WUI.*

There are three types of WUI Community Protection Zones (CPZ):

1) Boundary – areas where development is adjacent to public or private wildlands
2) Intermix – structures are scattered and interspersed among wildland areas
3) Island or occluded – area of wildland surrounded by development, i.e. a subdivision preserve



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 planning activities.

The areas of interest are called Community Protection Zones, or (CPZs). CPZs are based on an analysis of the Where People Live housing density data and surrounding fire behavior potential. The Florida Forest Service maintains a list of these at-risk communities based on vulnerability information.

They communities are as follows: Columbia City, Deep Creek, Drew Grade, Ellisville, Five Points, Five Points, Ft. White, Hollingsworth Bluff, Lake City, Lulu, Mason City, McColskey, Mershon, Mikesville, Mt. Carrie/Osceola Communities, Suwannee Valley, Three Rivers Estates, Wilson Springs, Winfield and Watertown. Other Communities/areas of Interest can be considered based on historical data and local experience.

Having been selected and shape files ascribed, the above communities/areas can be spotlighted as WUI CPZs. WUI CPZs represent those areas considered highest priority for mitigation planning activities. Inclusive would be CPZ WUI buffers of 1.5 miles around actual places where people live as well as significant infrastructure, utility corridors and major evacuation routes. Secondary CPZ boundaries inherently incorporate fire behavior conditions as well. An example of the WUI and CPZ maps are below in the following Figures 4T and 4U. The WUI Risk layer is the rating of the potential impact of a wildfire on the people and their homes. The CPZ map is based on Where People Live in reference to housing density data and the surrounding fire behavior potential.

Figure 4T – Deep Creek WUI Risk

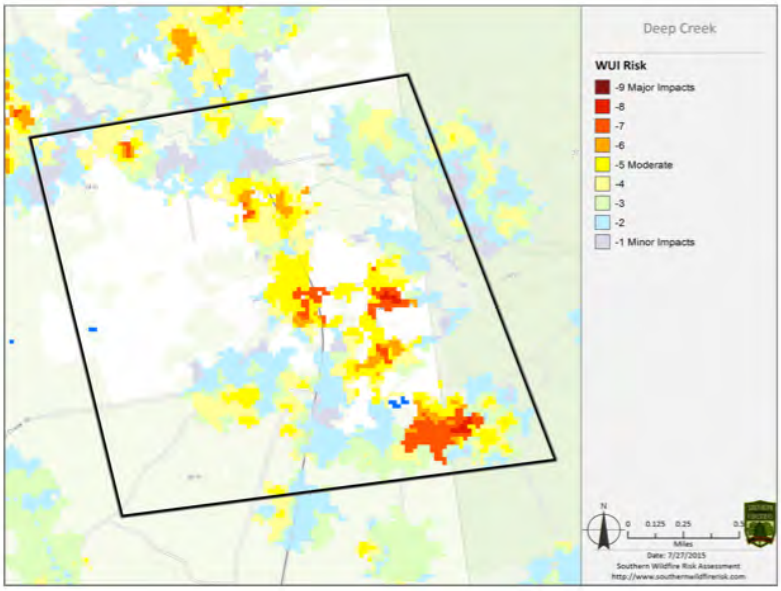
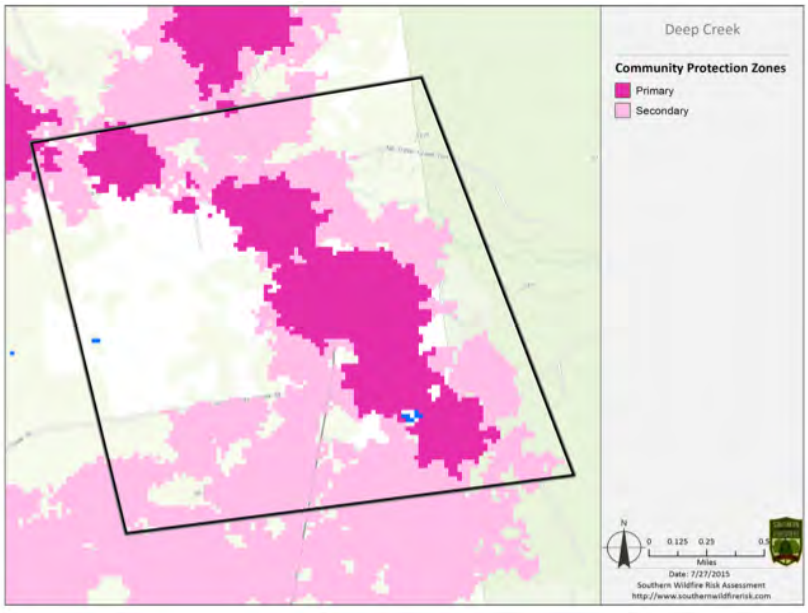


Figure 4U – Deep Creek CPZ



Vulnerability for the Columbia County's Population

The highest risk areas for the population are in the unincorporated areas of the County and the communities noted above. Due to the concentration of residents in rural wooded areas of Columbia County, additional threats to life and property exist, therefore, requiring increased mitigation efforts. The potential of impact to residents who live near/around forest or private timber company land is the greatest due to interface issues. The greatest threat is in the Town of Fort White were a wildfire could impact as many as 1,500 people and force the evacuation of as many as 833 homes. This segment of the population could include persons with special needs, farm workers, the elderly, tourist population, non-English speaking/hearing impaired, mobile home, and transient visitors.

Vulnerability for Columbia County's Structures and Facilities

Tables 4.27 – 4.30 summarize the following details for Wildfires in Columbia County on:

- the structures by occupancy type within each level of concern;
- the value of structures by occupancy type within each level of concern;
- the county facilities by their wildfire level of concern; and
- the value of county facilities within wildfire level of concern.

Table 4.27 – Structures Level of Concern for Wildfires in Columbia County

Level of Concern	Single Family Res.	Multi-Family Res.	Mobile Home	Vacant Res.	Agric.	Comm.	Instit./ Gov.	Indust.	Vacant Comm./ Indust./Inst	Misc./ Undef.
1	257	1	276	0	130	7	13	0	0	0
2	444	4	420	0	172	15	12	0	0	0
3	2,248	45	1,572	0	584	133	75	8	0	0
4	914	13	582	0	155	60	31	13	0	0
5	864	22	590	0	125	80	31	14	0	0
6	1,115	29	696	0	129	119	37	16	0	0
7	1,297	46	713	0	131	102	51	19	0	0
8	706	22	284	0	41	54	23	10	0	0
9	707	38	196	0	40	88	18	82	0	0

Source: State of Florida Enhanced Hazard Mitigation Plan, Page C.103 - 104

Table 4.28 – Value of Structures Level of Concern for Wildfires in Columbia County

Level of Concern	Single Family Res. - $million	Multi-Family Res. - $million	Mobile Home - $million	Vacant Res. - $million	Agric. - $million	Comm. - $million	Instit./ Gov. $million	Indust. $million	Vacant Comm./ Indust./Inst - $million	Misc./ Undef. - $million
1	35.17	1.23	15.94	9.97	130.48	0.30	102.93	0.00	0.01	3.20
2	56.58	2.09	23.66	15.16	96.26	0.54	31.59	0.15	0.06	3.15
3	256.99	7.68	80.19	39.38	235.37	12.01	54.13	4.43	2.94	9.44
4	101.50	2.65	29.09	13.09	53.88	10.19	15.21	19.95	2.43	2.39
5	97.25	4.65	28.98	11.89	41.44	12.25	13.81	18.32	3.16	1.92
6	128.60	4.86	34.41	13.49	41.72	19.48	15.65	17.86	4.55	2.38
7	146.58	9.24	35.29	14.84	42.07	31.18	29.24	20.39	5.36	2.27
8	76.54	2.80	14.81	5.97	14.01	15.04	18.02	5.09	4.05	0.77
9	78.39	6.49	9.50	5.80	14.77	33.60	12.10	20.31	9.35	1.20

Source: State of Florida Enhanced Hazard Mitigation Plan, Page C.125

Table 4.29 – County Facilities by Level of Concern for Wildfires in Columbia County

Facility	LOC 1	LOC 2	LOC 3	LOC 4	LOC 5	LOC 6	LOC 7	LOC 8	LOC 9	Total by Type
Hospitals	0	0	1	0	0	0	0	0	0	1
Police Stations	2	2	1	0	0	0	0	0	0	5
Other Facilities	6	175	30	5	1	0	1	0	2	220

Source: State of Florida Enhanced Hazard Mitigation Plan, Page C.144

Table 4.30 – Value of County Facilities by Level of Concern for Wildfires in Columbia County

Facility Type	LOC 1 $ thou.	LOC 2 $ thou.	LOC 3 $ thou.	LOC 4 $ thou.	LOC 5 $ thou.	LOC 6 $ thou.	LOC 7 $ thou.	LOC 8 $ thou.	LOC 9 $ thou.	Total Value of Facilities within Areas of Concern ($million)
Hospitals	0	0	19	0	0	0	0	0	0	0.0
Police Stations	53	102	76	0	0	0	0	0	0	0.2
Other Facilities	334	86,192	17,440	1,133	216	0	123	0	378	105.8

Source: State of Florida Enhanced Hazard Mitigation Plan, Page C.151

Key Issues for Columbia County

The highest risk areas are in the unincorporated areas of the County and the communities noted above. Due to the concentration of residents in rural wooded areas of Columbia County, additional threats to life and property exist, therefore, requiring increased mitigation efforts. The potential of impact to residents who live near/around forest or private timber company land is the greatest due to interface issues. The greatest possible threat is in the Town of Fort White.

Summary details for wildfire events:

Probability	The probability for wildfire events is medium (at least 1 occurrence every 3 years).
Location	The entire planning area (the City of Lake City, the town of Ft. White, and unincorporated areas of Columbia County) could be at high risk to a wildfire event as wildfires have been known to affect both the incorporated and unincorporated areas of the County. The Florida Forest Service maintains a list of community protection zones (CPZ) based on where people live, the housing density data and the surrounding fire behavior potential. The at-risk communities based on vulnerability information are the following: Deep Creek, Ellisville, Lulu, Mason, McColskey, Five Points, Ft. White, Lake City, Suwannee Valley, Winfield and Watertown. Other Communities/areas of Interest can be considered based on historical data and local experience: Benton, Browns Landing, Columbia City, Drew Grade, Greenfield, Hollingsworth Bluff, Lacymark, Mershon, Mikesville, Mt. Carrie/Osceola Communities, Newco, Springville and Vinzant Landing.
Extent	Based on the quantitative measurement for wildfires, the extent and worse case scenario would be the Bugaboo Fire that burned over 123,014 acres in Baker and Columbia County.
Impact	The Columbia County community, the residents, the structures, and the infrastructure suffered from a wildfire event. Based on the data recorded from the "Significant Wildfires in Florida 1981 – 2008", the impact from the Bugaboo wildfire that burned 123,014 acres in Baker and Columbia counties caused over 10 million in property damage in Columbia County, road closures due to smoke and visibility and evacuations for some of the county residents.

	Details from NCDC during the Bugaboo Fire on Columbia County From 5/10 to 5/13, the fire burned SW toward Deep Creek and Lake City in Columbia causing evacuations in those areas and sporadic closings of I-10 and I-75 in the area. By 5/13, the Florida Bugaboo Scrub Fire had burned 102,000 acres and Georgia Bugaboo had burned 131,718 acres, the total for both were 233,718 acres and 570 persons were forced from their homes. Smoke from these large fires produced hazy conditions as far south as Miami over the weekend. On 5/14, around 4 pm, the fire jumped containment line in the Fairview Road was of US 441, about five miles N of the Deep Creek community but was contained overnight. At this time the fire was considered to be 50% contained. On 5/15, a critical day for firefighters as wind gusted to 18 mph, with low humidity and higher temperatures making containing the fire more difficult. The fire was located about 8 miles N of I-10 and 1/5 miles E of US Hwy 441. While no homes were damaged or destroyed, the fire burned to within a mile of the closest home located on Omar Terrace, about a mile E of US 441 and the Deep Creek community. At this point, there are some 300 homes were evacuated affecting approximately 1,000 people, with 48 structural fire units were situated around 350 homes in the immediate area of the fire to prevent loss.

Drought - (*including Heat Wave)*

Drought

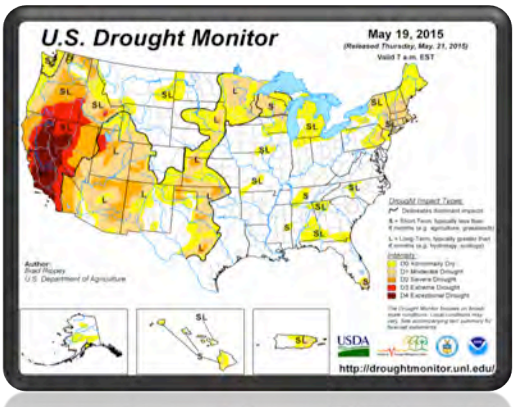


Figure 4V – U.S. Drought Monitor

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 was derived from the Palmer Drought Severity Index from the National Weather Service, Climate Prediction Center. 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.

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."

The PDSI data for Columbia County on years (2011 – May 2015) are as follows:

- ✓ (2011) - There was a recorded period of time in the months of January, April, May, June, July, August, September, October, November and December that had periods of moderate, severe and extreme drought.

- ✓ (2012) -There was a recorded period of time in the months of January, February, March, April, May, and the 1st and 2nd weeks of June that had periods of moderate, severe and extreme drought.

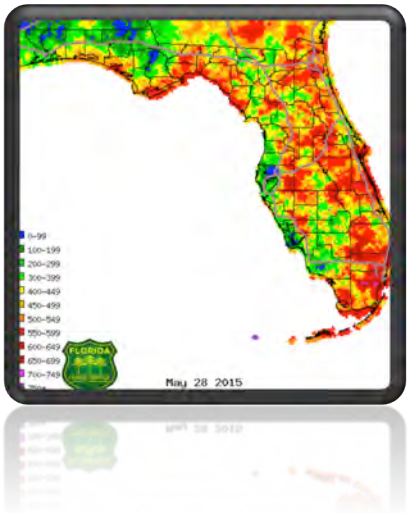
- ✓ (2013 – May 2015) - There was no drought data recorded in fiscal years 2013, 2014 and January – May 23, 2015.

Source: http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/regional_monitoring/palmer/

In addition to the drought monitor, the county utilizes the Keetch-Byram Drought Index (KBDI), which is updated each day by the Florida Forest Service. 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.

Figure 4W - Keetch Byram Drought Index (KBDI)

The direct physical effects of drought in Columbia County typically include poor crops (i.e. forage-land use for all hay and haylage, grass silage, and greenchop, peanuts for nuts, corn for grain, cotton and upland cotton), 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.

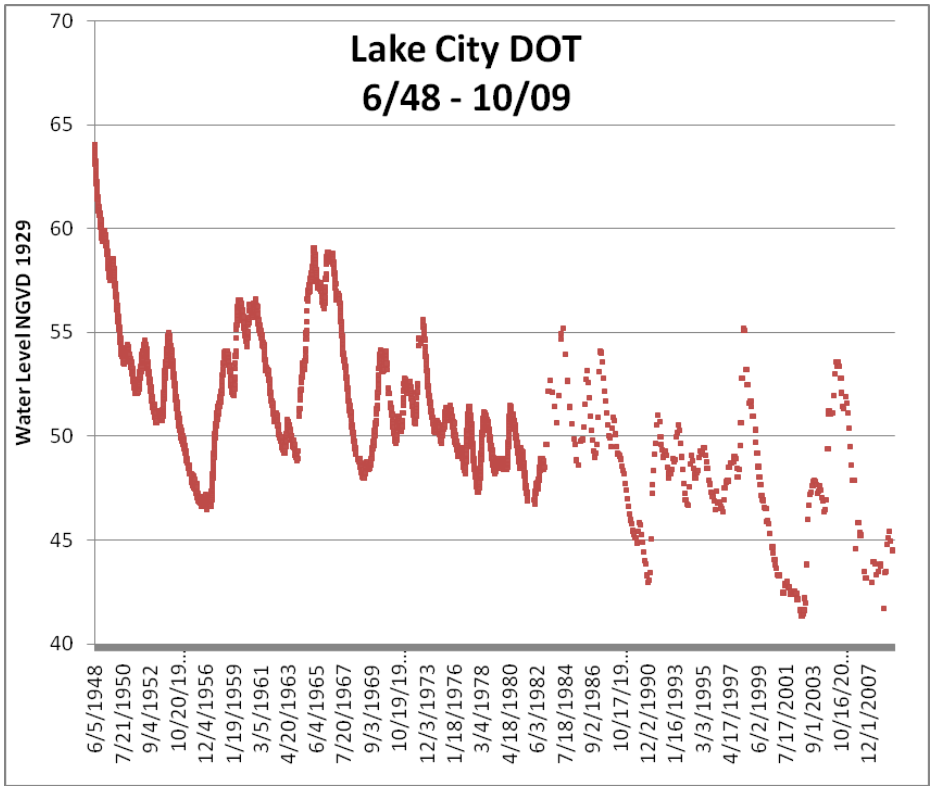


Source: http://flame.fl-dof.com/fire_weather/KBDI/4km_main.html

Groundwater Levels

Groundwater data has been collected by Suwannee River Water Management District (SRWMD) on regular basis since 1948, and water levels in the municipal well field have fluctuated from a high of 64 feet (above mean see level) in late 1940's to a low of 41 feet (above mean see level) in the early 2000's. All though there are many periods of high groundwater levels in the past sixty years, the data shows a continued trend of lower groundwater levels. Figure 4X shows this trend for the City of Lake City. Columbia County experienced drought like conditions in 2007.

Figure 4X – City of Lake City Historic Water Levels



Heat Wave

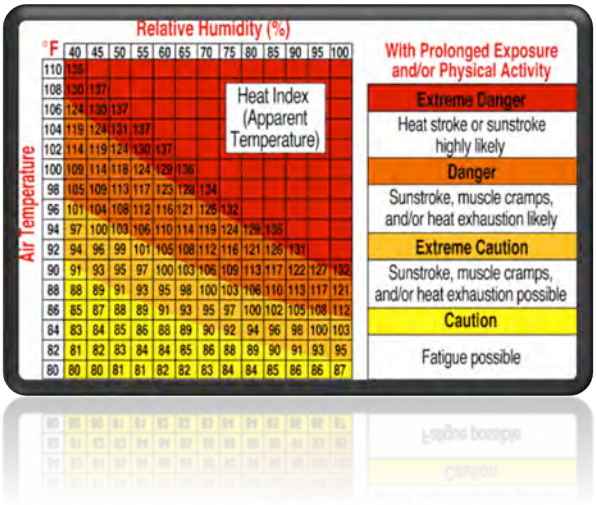
According to the Florida Department of Health, Division of Community Health Promotion, Public Health Research Unit … "Future scenarios indicate that the majority of Florida may be at high heat risk with monthly-mean daily maximum temperatures between 95-100°F." Columbia County does experience high heat temperatures during the summer months, therefore, it is important to profile heat wave as a natural hazard.

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.

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.

Figure 4Y - Heat Index Chart –
Air Temperature and Relative Humidity versus Apparent Temperature



To find the HI, look at the Heat Index Chart, Figure 4Y. 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.

IMPORTANT: Since 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.

Columbia County's hot season are the months of June to August with an average temperature of 90°F to 91 °F. Heat wave events occurring in the hot season would be in the 100°F plus temperature range. The hottest temperature recorded in Lake City was 106 °F in June 1918. 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 106°F, review the Heat Index Chart, Figure 4Y, and locate the information if the RH was only 50%, 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 Wave Occurrence

After careful research there have been no documented data or statistics reported on specific heat wave incidents that have occurred in the county. Therefore, information on impact from heat wave events is difficult to determine.

Columbia County does have a statistic on the hottest temperature recorded in the county – Lake City was 106 °F in June 1918. Although the relative humidity data was not available, the county is located in a humid subtropical climate zone and at the time, and the humidity was probably high considering the time of year for the record temperature.

In addition, there is one recorded heat-related incident that occurred in Columbia County in May 2015. The temperature was in the 90's that day and the humidity was probably high due to the county's location. Details reveal:

- On May 12, 2015, a young 16-month old child died after she was found in a hot car in Lake City. A child's body temperature can rise up to five times faster than an adult's, leading to heatstroke, then death when his or her temperature reaches 107°F. The temperature that day reached 93.9 with high humidity, although the exact humidity level was not noted. Based on the Heat Index Chart at 93.9 air temperature with a 90% RH, the HI would have been approximately 135 °F. The specifics reveal that she sat in a hot car all day long.

Vulnerability for Droughts and Heat Waves

Vulnerability to drought and heat wave events can be defined as to the extent to which people will experience harm and property will 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 are the primary impacts to nature, while heat exhaustion and other heat-related illnesses are possible among vulnerable children, the sick and the elderly.

Florida was very vulnerable in the 1998 drought resulting in extensive drought-induced fires, which burned over 475,000 acres in Florida and cost $500 million in damages. With lower than normal 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 also included Columbia 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 for wildfires, sinkhole development, and even the draining of lakes. Although

Columbia County wasn't as impacted from this 1998 drought. There was no significant water shortage throughout the county, however, several individual private wells were affected.

Agriculture

The agricultural industry in the county is especially vulnerable to drought occurrences as they can be particularly damaging to this important industry in the county. According to the 2012 Census of Agriculture, the county has a market value of agricultural products sold: $108,574,000, 83% of sales is from livestock (cattle, calves, and goats) and the county is ranked 4th in the State, and 17% comes from crop sales (top crops; forage-land used for all hay and haylage, grass silage, greenchop, peanuts for nuts, corn for grain, cotton and upland cotton). Long-term concerns include reduced supplies of potable water due to water table level drops impacting livestock watering ponds and residents with wells as their primary water source.

Groundwater

The entire county could have vulnerability if the groundwater was over pumped, dry weather persists and there was a decline to the groundwater. Groundwater, which is found in aquifers below the surface of the Earth, is one of the most important natural resources. It is 33% of the water that county and city water departments supply to households and businesses, and the groundwater provides drinking water for more than 97% of the rural population who don't get their water from the city or county water department or a private water company.

Water levels in the municipal well field have fluctuated from a high of 64 feet (above mean see level) in late 1940's to a low of 41 feet (above mean see level) in the early 2000's. All though there are many periods of high groundwater levels in the past sixty years, the data shows a continued trend of lower groundwater levels.

Vulnerability for the Columbia County's Population

The entire population of 68,377 residents could be effected by a drought or a heat wave event, especially water shortages, which could present a serious problem.

According the Florida Department of Health…"There are important public health implications from drought conditions, including the potential increase in respiratory illness due to dry air and airborne particles, a need for water conservation leading to poor hygiene and food safety concerns, concentration of sediments in dwindling water supplies providing a nutrient rich environment for pathogens, and increased contact between humans, animals, and vectors near remaining water sources."

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. A heat wave event does present a safety threat for the county's population, which would include the elderly, the sick, the poor and the children, with high temperatures and a high heat index, along with other factors, the combination can be deadly.

Vulnerability for Columbia County's Structures and Facilities

The Columbia County's buildings, structures, facilities and infrastructure are not considered vulnerable to drought and heat wave events. It is important to note that a long-term drought event could present some vulnerability to the water wells, and the agriculture industry's irrigation system is the most vulnerable in the county.

Key Issues for Columbia County

Groundwater, accounts for 33% of the water that county and city water departments supply to households and businesses, and the groundwater provides drinking water for more than 97% of the rural population who don't get their water from the city or county water department or a private water company. All though there are many periods of high groundwater levels in the past sixty years, the data shows a continued trend of lower groundwater levels.

Summary details for drought/heat wave events:

Probability	The probability for drought or heat wave events is medium (at least 1 occurrence every 3 years).
Location	The entire planning area (the City of Lake City, the town of Ft. White, and unincorporated areas of Columbia County) could be at medium to high risk to a drought or heat wave event.

Extent	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 Columbia 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." Based on the heat wave data in Columbia County, the hottest temperature recorded in Lake City was 106 °F in June 1918. 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 106°F, if the relative humidity was only 50%, the heat index would have been 137°F.
Impact	*Droughts* are 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. 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. Reduced water supply can lead to failed crops leading to adverse impacts to the local economy. Drought also strains ecosystems that rely on predictable seasonal rains and raises the danger of wildfire. The Columbia County agricultural community and the residents would be impacted from a lengthy and damaging drought event. With over 945 farms in the county and a market value of the agricultural products (crop and livestock) sold of: $108,574,000 (data recorded from the 2012 Census of Agriculture), the effect could be considerable loss in revenue for the county.

	Heat Wave The impact from a heat wave event combining high temperatures with a high heat index could affect the elderly population, children, the sick, and the special needs residents especially those living within the city or town limits resulting in death. Heat-Related Incident On May 12, 2015, a young 16-month old child died after she was found in a hot car in Lake City. A child's body temperature can rise up to five times faster than an adult's, leading to heatstroke, then death when his or her temperature reaches 107°F. The temperature that day reached 93.9 with high humidity, although the exact humidity level was not noted. Based on the Heat Index Chart at 93.9 air temperature with a 90% RH, the HI would have been approximately 135 °F. The specifics reveal that she sat in a hot car all day long.

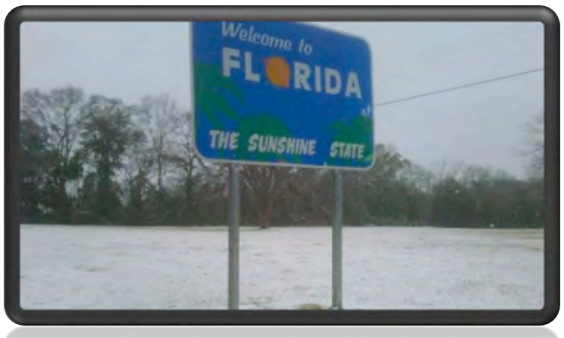
Winter Storms/Freezing Temperatures

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.

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.

According to the NCDC in table 4.31, there was one winter weather occurrence reported in Columbia County over the last 64 years, however, additional data on winter events are noted from other resources.

Table 4.31 – Winter Weather Occurrences in Columbia County – (1950 – 1/31/2015)

Location or County	Date	Time	Type	Dth	Inj	PrD	CrD
Columbia (Zone)	12/26/2010	8:30	Winter Weather	0	0	0.0K	0.00K
Totals:	N/A						

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

Key Code: Dth: Deaths; Inj: Injuries; PdD: Property Damage;vCrD: Crop Damage

1) 12/26/2010; Columbia Zone – Low level moisture and strong cold air advection on the west side of a 1000 mb surface low offshore of the Georgia Atlantic Coast brought a wintry mix of snow flurries and sleet during the mid morning hours to parts of NE Florida.

Additional Winter Weather Occurrences

(Recorded data from the following sources: NOAA News; USDA Department of Agriculture (USDA) NOAA Southern Region Headquarters; NWS and NCDC (not direct specific details for Columbia, however, for the

entire State for the Storm of the Century)

1) 1/28/2014 - The National Weather Service has placed Duval, Baker, Columbia and Nassau counties under a winter storm watch for Wednesday through Thursday morning as a strong cold front is likely to bring sleet and freezing rain south to Northeast Florida. Forecasters say rain will mix with sleet starting Wednesday morning along and to the north of Interstate 10. A mix of rain, sleet and possible snow is possible in the evening, continuing overnight into Thursday morning. Because temperatures will fall below freezing Wednesday night into Thursday, there is a possibility of ice on the roadways -- especially on bridges and overpasses. This is even more likely inland, especially in the Suwannee River Valley.

2) 5/8/2013 – The U.S. Department of Agriculture (USDA) has designated Columbia County as primary natural disaster area due to losses caused by frosts and freezes that occurred on March 26-29, 2013. All qualified farm operators in the designated areas eligible for low interest emergency (EM) loans from USDA's Farm Service Agency (FSA), provided eligibility requirements are met. Farmers in eligible counties have eight months from the date of the declaration to apply for loans to help cover part of their actual losses. FSA will consider each loan application on its own merits, taking into account the extent of losses, security available and repayment ability. FSA has a variety of programs, in addition to the EM loan program, to help eligible farmers recover from adversity.

3) 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.

4) 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 Columbia County statistics and fatality data was not available).
5) 12/1989 - The freeze of December 1989 rendered the closure of Interstates 75 and 10.

6) 12/14/1952 - North Florida - Snow and Sleet - Trace of snow or sleet with frozen precipitation occurred before noon in Lake City. Temperatures were above freezing and snow or sleet melted as it fell.

Vulnerability for Winter Storms/Freezing Temperatures

Vulnerability to winter storms or freezing temperature wave events can be defined as to the extent to which people will experience harm and property will be damaged from the natural hazard. Extreme cold and freezing temperatures can immobilize the county causing road closures due to icy roads, power outages, disruption in communication services, and no heat for several days, under the most severe circumstances. And severe winter storms can require persons to abandon their homes and possibly seek shelter. The severity or magnitude of a severe winter storm depends on several factors including a region's climatological susceptibility to a winter storm, temperatures, and the duration of the storm. The most vulnerable would be the elderly, sick and poor.

Columbia County is vulnerable to winter storms. The county has no specialized equipment available locally for snow or ice problems on roadways. Power outages can affect numerous residents as most are dependent on private wells for water and electrical heat. The last significant winter storm to occur in Columbia County was the "no name" storm of March 1993. The county experience significant wind damage and property damage. The total estimated damage cost is difficult to determine since this event would most likely have affected the livestock and/or agricultural products, which are covered by insurance or other government subsidy/public agricultural assistance programs.

Columbia County can expect several hard freezes during the winter season. The vulnerability to freezing temperatures can stress the community resources of the county citizens, business, timber and the agricultural industry. Extreme freezing conditions can render the roads impassable due to icy conditions thereby having an effect on local emergency response agencies. Below freezing temperature could cause electrical power outages, thereby leaving many homes without heat or water. Water pipes in houses in southern climates often are more vulnerable to winter cold spells. The pipes are more likely to be located in unprotected areas outside of the building insulation, and homeowners tend to be less aware of freezing problems, which may occur only once or twice a season. In such cases, the requirement to open emergency shelters could exist.

Agriculture

The agricultural industry in the county is especially vulnerable to freezing temperature occurrences as they can be particularly damaging to this important industry in the county. Hard freezes can be especially damaging when crops are planted and trees are in blossom early. According to the 2012 Census of Agriculture, the county has a market value of agricultural products sold: $108,574,000, 83% of sales is from livestock (cattle, calves, and goats) and the county is ranked 4th in the State, and 17% comes from crop sales (top crops; forage-land used for all hay and haylage, grass silage, greenchop, peanuts for nuts, corn for grain, cotton and upland cotton).

Vulnerability for the Columbia County's Population

The entire population of 68,377 residents could be affected by a winter storm or freezing temperature event leaving many homes without heat or water. The number of people vulnerable by these conditions could range from a very few to possibly hundreds. This segment of the population could include persons with special needs, farm workers, elderly, poor, non-English speaking or hearing impaired, mobile home, and possibly transient visitors.

Vulnerability for Columbia County's Structures and Facilities

The Columbia County's buildings, structures, facilities and infrastructure could have some impact from winter storms or freezing temperature events. The structures would only suffer minimal structural damage, however, power interruptions can occur and backup power is recommended for the county's critical facilities and infrastructure.

Key Issues for Columbia County

Preparedness and emergency shelters in place are key element for the most vulnerable elderly, sick and poor in case of power outages and frozen pipes. Also, having backup power for the county's critical facilities and infrastructure.

Summary details for winter storm/freezing events:

Probability	Based on past occurrences, the probability of winter storm and freeze occurrence in Columbia County, is low for winter storms to possibly medium for freezing temperatures (winter storms at least 1 occurrence every 10 years, and freezing temperatures at least 1 occurrence every 3 years).
Location	The entire planning area (the City of Lake City, the Town of Ft. White, and unincorporated areas of Columbia County) is at risk to winter storms and freezing temperatures. 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. In addition, freezing temperatures could result in ruptured pipes in structures, electrical power outages, and increased threats to sick, elderly, and special needs residents. Also, the location for the agricultural products for the county could be at considerable risk with damaging effects on the county's top crops (i.e. forage-land use for all hay and haylage, grass silage, and greenchop, peanuts for nuts, corn for grain, cotton and upland cotton).

Extent	Based on historical data for the State of Florida, the coldest temperature was -2 degrees F in February 1899. This recorded temperature would be the extreme and worst-case scenario. In addition, freezing temperatures in the 20s and 30s can last for a few days. In addition, the county suffered the effects from the Storm of the Century in March 1993.
Impact	Freezing temperatures and winter storms can have a destructive impact on crops and livestock if not protected from the frigid temperatures. Property damage can occur on buried water pipes. Power outages and icy roads can affect emergency response services and cause business interruption. And schools often close during extreme cold snaps to protect the safety of children who wait for school buses. The Columbia County agricultural community and the residents could suffer from a damaging winter storm/freezing temperature event. With over 945 farms in the county and a market value of the agricultural products (crop and livestock) sold of: $108,574,000 (data recorded from the 2012 Census of Agriculture), the effect could be considerable loss in revenue for the county. In addition, on February 9, 1999, the City of Lake City received three inches of snow from a strong blizzard on the Eastern seaboard. Although details and specifics on property or crop damage was not available.

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.

Repetitive Loss Properties for Columbia County by Jurisdiction

Unincorporated Columbia County

- 105 residential RL properties
- 1 business RL property

City of Lake City

- 2 residential RL properties
- 2 business RL properties

In addition, Columbia County and the SRWMD created a map of the repetitive loss and adjacent properties. The map was created on 8/24/2009, and will be used for planning purposes. See Appendix III for the RL property map for the county.

The map legend notes the following:

- ✓ Green - FEMA Repetitive Loss Properties (consisting of single family dwellings, sfr piling, mobile homes, duplex and one office).
- ✓ Yellow – Columbia County Repetitive Loss Properties (consisting of single family dwellings, sfr piling, mobile homes, duplex, modular, vacant, and one service shop).
- ✓ Blue – Adjacent Properties to the Repetitive Loss Properties (consisting of single family dwellings, duplex, mobile home, multi-family residences, sfr piling, vacant, and one barn).

Section 5 – Mitigation Strategy

Requirements:

§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.

Columbia County LMS Mitigation Goals and Objectives

Columbia 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.

In the planning process the Workgroup/Committee establishes goals for the entire planning area and all of the participating jurisdictions. The following was noted for the goals and objectives that were identified in the previous approved LMS plan:

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

Table 5.1 - Columbia County Local Mitigation Strategy
Mitigation Goals & Objectives

Hazard	Goal description	Objectives
Flooding	Goal 1 Minimize the effects of flooding in Columbia County	1.1 Identify most problem area's 1.2 Maintain and update flood data/maps 1.3 Ensure infrastructure can withstand and function effectively during flooding events 1.4 Update and maintain current sub-division zoning regulations 1.5 Perform additional flood studies in Zone A areas to establish Base Flood Elevations (BFE) 1.6 Purchase/retrofit repetitive loss properties 1.7 Continue to enforce zoning regulations and flood ordinances 1.8 Annually review and update existing flood ordinances if

		necessary 1.9 Continue to educate public on all perils 1.10 Work to increase inspection of existing properties in AE: floodway zones for compliance with flood ordinance
	Goal 2 Minimize loss of public utilities	1.1 Update and maintain current zoning regulations to minimize damage and utility service disruption 1.2 Continually work with utility companies to maintain utility service minimizing down time
Hurricanes/ Tropical Storms	Goal 3 Minimize damage to existing and future buildings and infrastructure as a result of a hurricane	1.1 Continue to enforce current building codes
	Goal 4 Minimize loss of public utilities	1.1 Update and maintain current zoning regulations to minimize damage and utility service disruption 1.2 Continually work with County utility companies to maintain utility standards for minimizing down time 1.3 Continually work with City utility companies to maintain utility standards for minimizing down time
Wildfire	Goal 5 Minimize the effects of wildfire in Columbia County	1.1 Support the Florida Forest Service with fuel reduction activities in the Wildland-Urban Interface 1.2 Support Florida Forest Service to educate homeowners about wildfires and the need for vegetation management programs such as prescribed fire 1.3 Coordinate with the Florida Forest Service to develop and retrofit strategies incorporating Firewise construction and landscaping techniques
	Goal 6 Minimize loss of public utilities	1.1 Continually work with utility companies to maintain utility service minimizing down time
All Hazards: Flooding, Hurricane/	Goal 7 Minimize loss of life and property to	o Continue to educate the public on all perils to include: safety, prevention, preparedness, insurance and more

Tropical Storms, Wildfire, Sinkhole, Tornado, Thunderstorms, Wind, Lightning, Hailstorms, Riverine Erosion, Winter Storms Freeze	natural hazards	o Adhere to current rules and regulations to reduce the affects of riverine erosion o Maintain infrastructure at City Municipal Airport o Maintain sufficient number of emergency shelters o Evaluate current conditions of public building and facilities to withstand natural hazards o Ensure public facilities and buildings are hardened to withstand natural hazards o Promote early warning systems to promote the safety of citizens through communication regarding all hazard events o Work to provide continued training for government officials (through FEMA, ASFPM, etc.)
	Goal 8 Minimize loss of public utilities	1.1 Maintain level of utility service to public in City limits

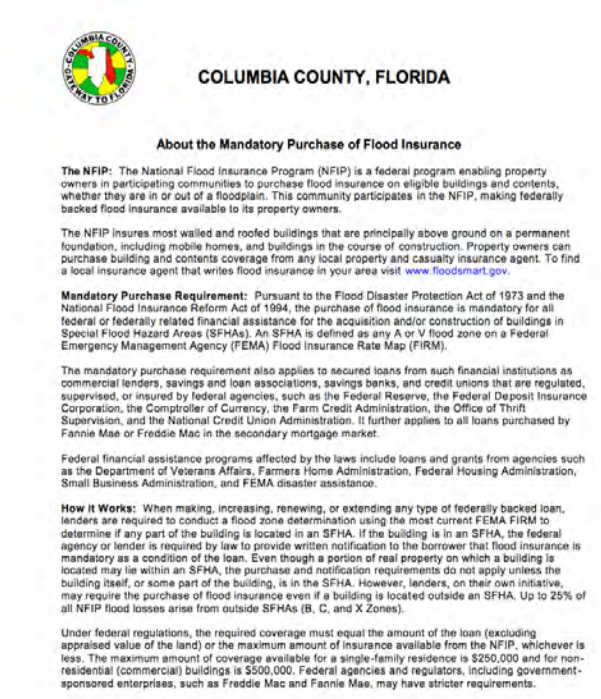
Summary overview of the goals and policy objectives

As Columbia 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 updated and reviewed at the October 14, 2014 LMS meeting.

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



COLUMBIA COUNTY, FLORIDA

About the Mandatory Purchase of Flood Insurance

The NFIP: The National Flood Insurance Program (NFIP) is a federal program enabling property owners in participating communities to purchase flood insurance on eligible buildings and contents, whether they are in or out of a floodplain. This community participates in the NFIP, making federally backed flood insurance available to its property owners.

The NFIP insures most walled and roofed buildings that are principally above ground on a permanent foundation, including mobile homes, and buildings in the course of construction. Property owners can purchase building and contents coverage from any local property and casualty insurance agent. To find a local insurance agent that writes flood insurance in your area visit www.floodsmart.gov.

Mandatory Purchase Requirement: Pursuant to the Flood Disaster Protection Act of 1973 and the National Flood Insurance Reform Act of 1994, the purchase of flood insurance is mandatory for all federal or federally related financial assistance for the acquisition and/or construction of buildings in Special Flood Hazard Areas (SFHAs). An SFHA is defined as any A or V flood zone on a Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM).

The mandatory purchase requirement also applies to secured loans from such financial institutions as commercial lenders, savings and loan associations, savings banks, and credit unions that are regulated, supervised, or insured by federal agencies, such as the Federal Reserve, the Federal Deposit Insurance Corporation, the Comptroller of Currency, the Farm Credit Administration, the Office of Thrift Supervision, and the National Credit Union Administration. It further applies to all loans purchased by Fannie Mae or Freddie Mac in the secondary mortgage market.

Federal financial assistance programs affected by the laws include loans and grants from agencies such as the Department of Veterans Affairs, Farmers Home Administration, Federal Housing Administration, Small Business Administration, and FEMA disaster assistance.

How it Works: When making, increasing, renewing, or extending any type of federally backed loan, lenders are required to conduct a flood zone determination using the most current FEMA FIRM to determine if any part of the building is located in an SFHA. If the building is in an SFHA, the federal agency or lender is required by law to provide written notification to the borrower that flood insurance is mandatory as a condition of the loan. Even though a portion of real property on which a building is located may lie within an SFHA, the purchase and notification requirements do not apply unless the building itself, or some part of the building, is in the SFHA. However, lenders, on their own initiative, may require the purchase of flood insurance even if a building is located outside an SFHA. Up to 25% of all NFIP flood losses arise from outside SFHAs (B, C, and X Zones).

Under federal regulations, the required coverage must equal the amount of the loan (excluding appraised value of the land) or the maximum amount of insurance available from the NFIP, whichever is less. The maximum amount of coverage available for a single-family residence is $250,000 and for non-residential (commercial) buildings is $500,000. Federal agencies and regulators, including government-sponsored enterprises, such as Freddie Mac and Fannie Mae, may have stricter requirements.

Columbia County posts details on the mandatory purchase of flood insurance for the county residents.

Floodplain management is the operation of a community program of corrective and preventative measures for reducing flood damage. These measures take a variety of forms and generally include requirements for zoning, subdivision or building, and special-purpose floodplain ordinances particularly with respect to new construction. Columbia County enforces local floodplain management ordinances that provide flood loss reduction building standards for new and existing development.

Compliance with NFIP

All jurisdictions within the County participate with NFIP. See table 5.2.

Table 5.2 - Columbia participation in the NFIP

CID #	Community Name	County	Init FHBM Identified	Init FIRM Identified	Curr Eff Map Date	Reg-Emer Date	Tribal
120070	Columbia County	Columbia County	1/20/1978	1/6/1988	2/4/2009	1/6/1988	No
120406	City of Lake City	Columbia County	10/29/1976	1/6/1988	2/4/2009	1/6/1988	No
120439	Town of Ft. White	Columbia County	N/A	2/4/2009	(NSFHA) *	9/30/2013	No

* NSFHA – No Special Flood Hazard Area – All Zone C

Table 5.3 - NFIP Policy Statistics as of 3/31/2015

Community Name	Policies In-Force	Insurance In-force whole $	Written premium In-force
Columbia County	856	$167,100,300	529,048
City of Lake City	60	$14,479,900	45,785
Town of Ft. White	1	$28,000	129

Unincorporated Columbia County NFIP Overview

As of 3/31/15, see table 5.3, there are currently 917 flood insurance policies in force. Current flood maps were updated and adopted February 4, 2009 and detailed floodplain studies were performed in the Flood Insurance Study (FIS) by FEMA and SRWMD on Rose Creek, Cannon Creek, and Montgomery Outlet Stream, Santa Fe River and the Suwannee River to create profiles prior to our last map revision. These profiles can be found in FIS #12023CV000A dated February 4, 2009. Prior to that date Columbia County was using flood maps from January 6, 1988.

Columbia County's current floodplain ordinance was adopted on December 31, 2008 and can be found in Article 8 of the Land Development Regulations (Appendix V). The new ordinance was adopted to meet 44 Code of Federal Regulations Section 60.3(b) of the NFIP. The Columbia County Planner serves as the designated Floodplain Administrator (Article 8, Section 8.3.3) and is also currently the CRS Coordinator.

Article 7 of the Land Development Regulations provides requirements for storm water management.

Article 8

- Section 8.3.4 requires a development permit for all development on any properties located within designated flood hazard areas.
- Section 8.4.1 the procedures and requirements for a development permit.
- Section 8.5.2 lists the specific standards that must be adhered to for development in all A zones where a BFE has been established.
- Section 8.5.3 lists specific standards required for development in A zones where a BFE has not been established.
- Section 8.5.4 lists standards required for development in AO zones.

Article 4

- Section 4.2.27 restricts placement of any structure no closer than 75‘ to the Ichetucknee River, Olustee Creek, Santa Fe River and Suwannee River. All other waterfront yards are restricted to 50‘ to the mean high water line or generally recognized river bank.
- Section 4.2.38 lists requirements for development in stream to sink and watershed areas.
- Section 4.2.40 lists standards for finished floor heights on all properties that are not located in a special flood hazard area.
- Article 4 of the Land Development Regulations also has Conservation (section 4.3), Environmentally Sensitive Areas (section 4.4), Agriculture 1, 2, and 3 (section 4.5) zoning districts wherein low density development is required. These zoning categories also have a special provision that prohibits development within 35‘ of any wetland.

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.

Per FEMA’s CRS Communities and their Classes file, 5/1/2014, the only jurisdiction in the County that participates in the CRS is: Unincorporated Columbia County. See table 5.4.

Table 5.4– Columbia County Community Rating System – 5/1/2014

Community Number	Community Name	CRS Entry Date	Current Effective Date	Current Class	% Discount for SFHA	% Discount for Non-SFHA	Status
120070	Columbia County	10/1/1996	10/1/2005	8	10	5	C

Columbia County does participate in the CRS and currently has a rating of 8. This represents a 10% savings on flood insurance rates for the community. The county currently implements and gets credit for the following CRS activities:

- ✓ Activity 310 - Elevation Certificates—copies of elevation certificates for properties built in the SFHA from June, 2004 and on are kept for the public to review
- ✓ Activity 320 - Map Information----Notification to three key groups, (lending, insurance, realtors) of map change effective 2-4-09, sources of additional information and process for review of determinations.
- ✓ Activity 330 - Outreach Projects----Flood information booklet sent to all properties that exist in determined repetitive flood areas.
- ✓ Activity 350 - Flood Protection Information----Website created for public use.
- ✓ Activity 410 - Additional Flood Data----flood studies done on additional areas of Alligator Lake, Lake Montgomery, Montgomery Outlet Stream, Cannon Creek, Rose Creek with profiles created for FIRM adopted February 4,2009.
- ✓ Activity 420 - Open Space Preservation----Aerial maps created depicting areas of open space within SFHA and acres of land designated as open space.
- ✓ Activity43 - 0LD Land Development Criteria---Aerial map created depicting low density, open space and special flood hazard areas.
- ✓ Activity 440 - Flood Data Maintenance----Maintenance of flood maps to show and revisions (LOMA, LOMR, etc.)
- ✓ Activity 450 - Storm Water Management----Inspection for compliance to all permits issued by SRWMD.
- ✓ Activity 502 - Repetitive Losses----Map created to determine repetitive loss areas and properties. Outreach project sent to all properties located in potential repetitive loss area.
- ✓ Activity 510 - Floodplain Management Planning----Update of LMS plan.

Continued adherence to requirements set forth in Article 8 of Columbia County Land Development Regulations, Flood Prevention Damage Regulations. The Conservation Element of Columbia County Comprehensive Plan contains many objectives and policies that support floodplain management provisions. Policy V.2.3 requires the county to identify and purchase environmentally sensitive lands.

Policy V.2.4 establishes the 35 ft. buffer around all wetlands. Policy V.2.6 requires the county's land development regulations to require all new development to maintain the natural functions of environmentally sensitive areas. Policy V.2.7 requires the county to provide for the regulation of development within 100-yr. floodplain, regulating freeboard requirements and density. Policy V.2.14 and V.2.15 establish buffers from rivers, streams, creeks, etc. Policy V.3.2 requires all proposed subdivision plats be submitted to the SRWMD for review and comment.

The Columbia County Building Department currently requires all permit applications to be reviewed by the building official to ensure compliance with the Florida Building Code and to be reviewed by the zoning department to determine zoning and flood zone determinations. Both departments must approve all permit applications submitted before a permit can be issued. Any information dealing with flood zone BFE, FIRM panel # and date are shown on the permit as well as any other requirements such as finished floor elevation certificate, etc.

Building inspectors are required to obtain 14 continuing education credits every 2 years. The Certified Floodplain Manager is required to obtain 16 continuing education credits every 2 yrs. Columbia County currently has a tutorial for surveyors on the website on proper completion of elevation certificates.

The Emergency Operations Center of Columbia County works closely with the Building and Zoning Department to map areas that are prone to frequent floods and track repetitive loss properties. After a disaster all damaged structures are inspected and the damage documented. Repetitive loss properties are purchased utilizing grant monies whenever possible.

The county library maintains a wealth of information for the public to access to educated themselves on flood issues to include retrofitting, safety, insurance, maps, historical data, and many other sources of information.

The County developed an eight-page color booklet (Appendix VI) which was noted in the 2010 LMS update plan for residence and property owners to educate and provide important information regarding the risk of floods in Columbia County. This booklet was sent to all property owners in the repetitive flood areas and is to be handed out to the general public at various fairs and festivals and is available online for residents to download and review. The information is very informative and provides specific guidance on prevention and preparedness. *All residents should review the details on the risk of floods in the County.*

Columbia County will continue to participate in the NFIP. The following actions have been identified, analyzed, and prioritized as necessary steps to remain in compliance with the program:

1. Continue to enforce the most current Florida Building Code, Land Development Regulations, and Comprehensive Plan,

2. Continue outreach efforts to the public with extra emphasis to those properties lying in the repetitive flood areas,

3. Continue to provide up-to-date FIRM information to all that seek information,

4. Continue to update the county website with information that will benefit the public and educate the builders, surveyors, and engineers that we work with,

5. Continue to monitor all elevation certificates and maintain records and copies for anyone to review,

6. Continue to assist local insurance agents with obtaining correct FIRM‘s and flood insurance rates,

7. Continue to participate in all hazard mitigation efforts to include working with Columbia County‘s Emergency Operations Center to maintain and monitor hazard data for future planning,

8. Continue to obtain grants to purchase repetitive loss properties,

9. Submit all information to FEMA necessary to keep current FIRM‘s as accurate as possible,

10. Participate whenever possible in any future flood studies, and

11. Continue to keep staff trained.

The Building and Zoning Department has reviewed the FEMA 85, Protecting Manufactured Homes from Floods and Other Hazards: The Building and Zoning Department will continue to evaluate if flood policies need to be updated to comply with the publication. If changes are made, the department will then begin the process of educating the local mobile home installers. The department has also reviewed 24 CFR Part 3286 Manufactured Home Installation Program that was published June 20, 2008. This publication from HUD sets prerequisites for installation licenses. We will coordinate this effort with the State of Florida Department of Business and Professional Regulation to determine what changes will be required.

To improve our level of participation, possible changes for the future may include expanding the ESA zoning and land use classification to include properties that are in all A zones. Increase the freeboard requirement for development in SFHA‘s, prohibit development in any floodways, increase inspection efforts for non-compliance of existing properties in AE floodway areas, participate in new flood studies as funds permit, and obtain additional funding to acquire more repetitive loss properties. Columbia County will examine all CRS activities every 5 years during our CRS visit to determine if it is feasible to augment an existing activity or add additional activities.

City of Lake City NFIP Overview

As noted in Table 5.2, the City of Lake City has been participating in the NFIP since October 29,1976 with Community Identification Number: 120406. As of 3/31/15, the City has issued 60 flood insurance policies with repetitive loss properties located within the Lake City area.

The flood maps adopted on February 4, 2009 are reflected in City Ordinance #2009-1175. The most recent Flood Studies were conducted in 1988 and are included in the current adopted map. The City of Lake City's Flood Management Ordinance is adopted Ordinance #2009-1175 and can be found in the City's Land Development Regulations as Article 8. The Ordinance makes findings to reflect current State and Federal requirements specifically those promulgated in part 44, CFR. In addition, there are program administrative components found in Subdivision Regulations (Art.5) and Planned Residential Developments (PRD Sec.)

Other Related Codes
The City of Lake City, Florida adopted and maintains a Comprehensive Plan which establishes Goals, Objectives, and Policies which establishes needs of the City to:

- ✓ Enhance quality of life by directing development to areas, which have levels of service to accommodate growth in environmentally acceptable standards.
- ✓ Provide for traffic circulation
- ✓ Provide safe, decent, and sanitary housing in suitable environments

The City integrates flood plain management into the Comprehensive Plan thought the following sections:

- ✓ Future Land Use (Sec. 1)
- ✓ Traffic circulation (Sec.2)
- ✓ Housing (Sec. 3)
- ✓ Levels of Service
- ✓ Sanitary sewer, solid waste, drainage, potable water and natural ground water
- ✓ aquifer recharge areas (Sec. 4)
- ✓ Conservation (Sec. 5)
- ✓ Recreation and Open Space (Sec. 6)
- ✓ Intergovernmental Coordination (Sec. 7)

City of Lake City Land Development Regulation (Ord. 1996-779-B) provides the following:

- ✓ Establishes Land Uses within districts (Art. 4)
- ✓ Provides for density or intensity of developments
- ✓ Establishes Subdivision regulations (Art. 5)

- ✓ High natural ground water aquifer recharge and water well field regulations (Art. 7)
- ✓ Flood damage Prevention (Art. 8)
- ✓ Hazardous Building regulations (Art. 9)
- ✓ Historic Sites and Structures preservation regulations (Art. 10)
- ✓ Concurrency Management (Art. 13)
- ✓ Enforcement and Review (Art. 14)

Although the City does not participate in the CRS, they have adopted and implemented standards above and beyond the NFIP standards in an effort to further reduce or eliminate damage from flooding. Ord. 2009-1175, Sec. 50-67 requires 2‘ to bottom of floor joist where elevations for —A‖ zones are not specified. Section 50-67 (4) (a) requires mobile homes outside of mobile home parks be elevated no lower than 2‘ above base flood elevation. Section 50-67 (4) (6) requires mobile homes inside parks in —A‖ thru —A-30‖ zones be elevated no lower than 2‘ above Base Flood Elevation.

Ensure the Provision of Public Drainage Facilities for Future Developments by:

- ✓ Standards to ensure post run-off rates do not exceed re-development rates
- ✓ Provide guidance to developers of storm design requirements
- ✓ Maintain standards as adopted by Florida Department of Environmental Protection and Rules of the SRWMD
- ✓ Ensure provisions for safe and reliable potable water system and Fire Hazard reduction capabilities
- ✓ Provide for conservation element that establishes policies, which conserve wetlands by use of alternative clustering development and the setting of density performance standards.
- ✓ Requiring the City to participate in the NFIP
- ✓ Establish 35‘ buffers around wetlands
- ✓ Where appropriate, City shall purchase environmentally sensitive lands (policy v.2.3)
- ✓ Establishes an Intergovernmental Coordination Element

The City‘s Land Development Administrator is designated as the Floodplain Administrator. In addition to information available within the public library the City‘s Growth Management Department maintains information and guides to development in SFHA‘s.

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

- ✓ City will emphasize the establishment of on-going drainage maintenance programs to support timely maintenance and repairs of ditches and culverts to minimize affects of flood events.
- ✓ City will continue to emphasize and promote training for Planners/Plan Reviewers for certification as Flood Plain Managers.

- ✓ Continue to maintain overlay maps of SFHA's to identify additional flood prone areas not identified on adopted FIRM's.
- ✓ Identify flood prone areas not on FIRM's and apply for assistance grants to include areas on maps (located in the northeast section of city).
- ✓ Continue to provide information to assist homeowner and developer guidance and measures to reduce damage related to the hazards identified in the LMS.
- ✓ Apply through grant process measures to improve or construct shelters in the event of future hazards.

Identification and Analysis of Columbia 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.

After review, it was recommended that it would better serve the local communities to include references of the LMS hazard maps in the comprehensive plans. The group determined that the fluctuation in hazards and the areas affected was too great to be sufficiently effective over the seven year comprehensive planning timeframe and decided not to include the maps but instead where possible, refer to the LMS.

As part of its strategy, the county will maintain its NFIP and the CRS certificate. 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. The county and its associated municipalities, when feasible, will also use any products produced through the FEMA's on-going field and database verification projects for repetitive loss properties.

The risk assessment identifies the county is most susceptible to floods, wildfires, hurricane/tropical storm and thunderstorm/wind and lightning events. The county and its associated municipalities evaluate their comprehensive plans and land development regulations for modifications to improve mitigation measures, with special emphasis on these occurrences. Through the years, Columbia County will continue to improve its recordkeeping and statistical data with regards to natural disasters for the annual vulnerability assessment.

The county maintains a list of repetitive loss structures and properties and adjacent properties. A map of the repetitive loss structures is in Appendix III. The county with the assistance of other related agencies (FDOT, SRWMD, and the Florida Forest Service) implements a public education campaign regarding

construction within floodable areas, the use of Firewise construction and landscaping practices, the use of burn bans, emergency water conservation regulations, as well as minimum housing codes with regards to minimum building standards.

Columbia County Local Mitigation Strategy Projects

Attachment I, an excel spreadsheet that 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.

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 5.5 determines that Columbia 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 5.5 – Comprehensive Range of Mitigation Projects

Comprehensive Range of Mitigation Projects - Columbia County			
Natural Hazards Profiled	Unincorporated Columbia County	City of Lake City	Town of Ft. White
Flooding	X	X	X
Sinkhole	X	X	X
Hurricanes/ Tropical Storms	X	X	X
Tornado	X	X	X
Thunderstorms/Winds/Lightning/Hailstorms	X	X	X
Erosion/Riverine Erosion	X	X	X
Wildfire	X	X	X
Drought/Heat Wave	X	X	X
Winter Storms/Freezing Temperatures	X	X	X

All Hazards	X	X	X
X - meets the requirements			

Implementation of the Mitigation Projects

All mitigation projects or initiatives were reviewed, analyzed, and revised according to the list of mitigation projects that were in the 2005 LMS Plan. Attachment I contains the list of all mitigation projects for the identified hazards.

As noted, the 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, if completed, if deferred, if deleted or any new projects that have been included.

Prioritization Process

The main emphasis of the prioritization process is to promote projects or initiatives with the greatest mitigation benefits to:

- support public health and safety,
- protect lives and property,
- reduce future damage,
- support essential services,
- support LMS goals,
- ensure regional benefits, and
- protect natural and cultural resources.

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.

After a natural disaster event receives a presidential declaration and Columbia County was declared as a result of the disaster; the county will be eligible for the Hazard Mitigation Grant Program funding. Once the county receives the disaster designation the LMS committee or workgroup 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.

The prioritization process developed 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 Columbia County's citizens and meet the other mitigation benefits noted. 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 Benefit Cost Ratio 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 five weighted criteria developed by the LMS Committee/Workgroup. 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 City prioritizes their own projects before submitting them to the LMS Working Group for review.

Listed in table 5.6 are the criteria and weighted values:

Table 5.6 – Benefit Cost Ratio Prioritization Process for the Mitigation Projects

Prioritization Criteria	Weighted Values
Does it accomplish one or all of the LMS goals?	4 points for each goal accomplished to total with no more than 32 points assigned
Does it promote the reduction of the loss of lives?	Yes = 25 points; No = 0 points
Does it promote the reduction in property damage?	Yes = 20 points; No = 0 points
Is the project required by regulation or is there an additional benefit to be provided by sponsoring agency (federal, state, or local programs?	Yes = 10 points; No = 0 points
Is there funding already available?	a. Funding source already identified = 7 points b. Strong potential source = 3 points c. No source identified = 0 points d. BONUS – if multiple sources are identified = 3 additional points

Table 5.7 identifies the mitigation projects that will benefit each jurisdiction, which is also located in Attachment I, the Columbia County New/Ongoing/Deferred LMS Project List. For details regarding the scope of work, the agency responsible, the estimated costs, the priority, the funding source and estimated timeframe for completion, see Attachment I.

Table 5.7 – Mitigation Projects that will Benefit Each Jurisdiction

Jurisdiction	General Location	Mitigation or Action Name	Mitigation or Action Type	Hazard Mitigated
Columbia County; Town of Ft. White; City of Lake City	Countywide	Residential Retrofits	Retrofit of existing structures	Wind
Columbia County; Town of Ft. White; City of Lake City	Countywide	Training, Outreach, Exercising, Partnership Building	Training, Outreach, Exercising, Partnership Building	All Hazards, emphasis on wind
Columbia County	Countywide	Communications Upgrades	Emergency Response Enhancement	All Hazards
Columbia County; Town of Ft. White; City of Lake City	Countywide	Risk & Vulnerability Assessment to include elements §201.6 c (2)(ii)(A), §201.6 c (2)(ii)(B), and §201.6 c (2)(ii)(C),	Risk & Vulnerability Assessment	All Hazards
Lake City	1650 East Putnam Street	Lake City Water Treatment Plant	Critical Facility Retrofitting	Hurricanes and Tropical Storms, Tornadoes and Downbursts, Wildfire, Flooding, Drought/Heat Wave

Lake City	750 East Margarets Road	Lake City Water Treatment Plant	Critical Facility Retrofitting	Hurricanes and Tropical Storms, Tornadoes and Downbursts
	Countywide	Hazard Outreach Campaign	Education & Outreach	All Hazards
Columbia County	Countywide	Volunteer Fire Department/Emergency Medial Services Facilities Retrofit	Emergency Services	All Hazards
Columbia County	Old County Club Road	Olustee Street	Drainage Improvements	Hurricanes and Tropical Storms, Thunderstorms, Flooding
Lake City	North Lake County	Washington Street Area Sewer Manholes	Drainage Improvements	Hurricanes and Tropical Storms, Thunderstorms, Flooding
Lake City	NE Lake City	Gibbs Street Area Sanitary Sewer Lift Station	Emergency Study and WWTP Flood proofing Enhancements	Hurricanes and Tropical Storms, Thunderstorms, Flooding
Columbia County	Countywide	Repetitive Loss Resident Buyouts	Public Acquisition	Hurricanes and Tropical Storms, Flooding
Lake City	NW Section Lake City	Gwen Lake Drainage Basin: Shelby Terrace	Storm water Management	Hurricanes and Tropical Storms, Thunderstorms, Flooding

Columbia County Fort White Lake City	Countywide	Comprehensive Plan Evaluation	Comprehensive Plan Evaluation	All Hazards
Lake City	NE Division Lake City	Fonie St. Jackson St. Aberdeen St. C.R. 100-a	Storm water Management	Hurricanes and Tropical Storms, Thunderstorms, Flooding
Lake City	SW Section Lake City	McFarlane Ave Grandview St. St. Margerets Road Lake Montgomery Outfall Alamo Rive U.S. 441/S. Marion Street	Storm water Management (Water Management District is currently conducting a storm water management study on this area)	Hurricanes and Tropical Storms, Thunderstorms, Flooding
Lake City	NEW Section Lake City	Gwen Lake Drainage Basin: Ashley St. Duval Street Ridgewood Drive Palm Circle Area	Storm water Management	Hurricanes and Tropical Storms, Thunderstorms, Tropical and Riverine Erosion, Flooding
Lake City	SW Section Bays/7th St. Area	Drainage into Lake Montgomery (7th Street/City Park)	Storm water Management	Hurricanes and Tropical Storms, Flooding
Lake City	SW Section El Prado Street	Drainage from S. First Street to Lake Montgomery	Storm water Management	Hurricanes and Tropical Storms, Flooding

Lake City	SW Section Lake City, Grandview and Troy Road	Quail Ridge Subdivision Area Drainage	Storm water Management	Hurricanes and Tropical Storms, Thunderstorms, Flooding
Columbia County	SE Lake City	Alligator Lake Discharge Study	Engineering Study and Drainage Improvements	Hurricanes and Tropical Storms, Flooding
Columbia County	Southern Columbia County	Clay Hole Branch	Engineering Study and Drainage Improvements	Hurricanes and Tropical Storms, Flooding
Lake City	SW Section Lake City	Drainage Retrofit Wall Avenue Poplar Street Spring Street Ball Avenue	Drainage Improvements	Hurricanes and Tropical Storms, Thunderstorms, Flooding
Columbia County Fort White Lake City	Countywide	Evacuation Route Signage	Signage	Hurricanes and Tropical Storms, Tornadoes and Downbursts, Wildfire, Flooding
Columbia County Fort White Lake City	Countywide	Community Emergency Response Team Enhancement	Volunteer Development	All Hazards
Countywide	Countywide	Repetitive Loss Resident Buyouts	Public Acquisition	Hurricanes and Tropical Storms, Thunderstorms, Flooding

Lake City	Central Business District	Downtown Area Lake City	Storm water Management	Hurricanes and Tropical Storms, Thunderstorms, Flooding
Lake City	U.S. Highway 90 East	Lake City Municipal Airport	Critical Facility Retrofitting	Hurricanes and Tropical Storms, Tornadoes and Downbursts, Thunderstorms, Flooding, Wildfires
Columbia County Fort White Lake City	Countywide	Comprehensive Plan High Aquifer Recharge	Comprehensive Plan Evaluation	Hurricanes and Tropical Storms, Thunderstorms, Flooding
Columbia County Fort White Lake City	Countywide	Comprehensive Plan Water Conservation	Comprehensive Plan Evaluation	Hurricanes and Tropical Storms, Thunderstorms, Flooding
Columbia County Fort White Lake City	Countywide	Minimum Housing Codes	Enforcement	All Hazards
Lake City	LCCC Main Campus 149SE College Place Lake City Florida	Construct campus storm water master plan	Storm water Management	Hurricanes and Tropical Storms, Thunderstorms, Flooding

Lake City	LCFlorida Gateway Community College Main Campus 149SE College Place Lake City Florida	Place primary electrical distribution underground	Mitigate storm damage to electrical grid	Hurricanes and Tropical Storms, Tornadoes and Downbursts
Lake City	422 SW Troy St	Repetitive Loss Resident Buyouts	Public Acquisition	Hurricanes and Tropical Storms, Thunderstorms, Flooding
Lake City	817 NW Clubview	Repetitive Loss Resident Buyouts	Public Acquisition	Hurricanes and Tropical Storms, Thunderstorms, Flooding
City Lake City School Board	1000 Pennsylvania Avenue	Richardson Middle School Shelter Retrofitting	Emergency Shelter Retrofitting	All Hazards
Columbia County	Fort White	Backup Generator for Fort White Substation	Emergency Response Enhancement	Hurricanes and Tropical Storms, Thunderstorms, Tornadoes and Downbursts
Columbia County Fort White Lake City	Countywide	Sinkhole Maps	Comprehensive Plan Evaluation	Sinkholes
Columbia County Fort White Lake City	Countywide	Residential Hurricane Shutters	Comprehensive Plan Evaluation	Hurricanes and Tropical Storms, Tornadoes and Downbursts

Columbia County Fort White Lake City	Countywide	Underground Utilities - New Residences	Comprehensive Plan Evaluation	Hurricanes and Tropical Storms, Tornadoes and Downburst
Columbia County	Santa Fe, Suwannee and Ichetuckne e Rivers	Comprehensive Plan Floodplain Restrictions	Comprehensive Plan Evaluation	Hurricanes and Tropical Storms, Flooding
Columbia County	Suwannee Valley	River Road Booker T. Combs Tiger Drain Nova Road	Floodway Study and Floodway Impediment Removal	Hurricanes and Tropical Storms, Flooding
Columbia County	Three Rivers Estates	California Road Central Boulevard	Floodway Study and Floodway Impediment Removal	Hurricanes and Tropical Storms, Flooding
Columbia County	Central	Hartford Road	Floodway Study and Floodway Impediment Removal	Hurricanes and Tropical Storms, Flooding
Columbia County	Santa Fe/O'Leno	Old Bellamy Hall Road Riverville Road	Floodway Study and Floodway Impediment Removal	Hurricanes and Tropical Storms, Flooding
Columbia County	Ichetuckne e Trace	Old Bellamy Hall Road Falkner Road	Floodway Study and Floodway Impediment Removal	Hurricanes and Tropical Storms, Flooding

Columbia County	Olustee Creek/Lulu	Pounds Hammock Road Horne Road High Falls Road James Croft Robert Cox	Floodway Study and Floodway Impediment Removal	Hurricanes and Tropical Storms, Flooding
Columbia County	Arrowhead	Arrowhead Road	Floodway Study and Floodway Impediment Removal	Hurricanes and Tropical Storms, Flooding
Columbia County	Tuskenegg ee Road	Tuskeneggee Road	Floodway Study and Floodway Impediment Removal	Hurricanes and Tropical Storms, Flooding
Columbia County	Pinemount Road	Pinemount Road	Floodway Study and Floodway Impediment Removal	Hurricanes and Tropical Storms, Flooding
Columbia County	North Swamp	Double Run Hunt Road Bell Road	Floodway Study and Floodway Impediment Removal	Hurricanes and Tropical Storms, Flooding
Columbia County	Falling Creek/Gwe n Swamp	Blackjack Road Dicks Road	Floodway Study and Floodway Impediment Removal	Hurricanes and Tropical Storms, Flooding
Columbia County	Pinemount/ Lake Lona Basin	Jeffia Allen Road Perry Road Pinemount Road Murray Road	Floodway Study and Floodway Impediment Removal	Hurricanes and Tropical Storms, Flooding

Columbia County	Five Points	Double Run Road	Road Improvements	Hurricanes and Tropical Storms, Thunderstorms, Flooding
Columbia County	Countywide	Retention Ponds Study	Engineering Study and Drainage Improvements	Hurricanes and Tropical Storms, Thunderstorms, Flooding
Columbia County	SW Section	Cris Street Area Floodway Study	Engineering Study	Hurricanes and Tropical Storms, Flooding
Columbia County	Santa Fe/O'Leno	Bible Camp Road	Roadway and drainage improvements	Hurricanes and Tropical Storms, Thunderstorms, Flooding
Columbia County	Country Club Road	Cherokee Avenue Retention Pond	Silt and debris removal	Hurricanes and Tropical Storms, Thunderstorms, Flooding
Columbia County Fort White Lake City	Countywide	Regulatory Floodplain Sinkholes	Floodplain Enhancement	Hurricanes and Tropical Storms, Thunderstorms, Flooding, Sinkholes
Columbia County	Countywide	Comprehensive Plan Sinkholes	Comprehensive Plan Evaluation	Sinkholes
Columbia County Fort White Lake City	Countywide	Tornado Mitigation	Comprehensive Plan Evaluation	Tornadoes and Downbursts

Columbia County Fort White Lake City	Countywide	Tornado Mitigation	Comprehensive Plan Evaluation	Tornadoes and Downbursts
Columbia County Fort White Lake City	Countywide	Repetitive Loss Resident Buyouts	Retrofit	Hurricanes and Tropical Storms, Thunderstorms, Flooding

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 hosts of funding sources available to counties of all sizes. Table 5.8 is a current list of possible funding sources that can be used for the mitigation projects.

Table 5.8 – Possible Funding Sources

Capitalization Grants for Clean Water State Revolving Funds	EPA awards capitalization grants to States to establish their Clean Water State Revolving Funds (SRF). The States, through the SRF, make loans for high priority water quality activities. As loan recipients make payments back into the fund, money is available for new loans to be issued to other recipients. While traditionally used to build wastewater treatment facilities, loans are used increasingly for other water quality management activities, including: agricultural; silviculture, rural and urban runoff control; estuary improvement projects; wet weather flow control, including stormwater and sewer overflows; alternative wastewater treatment technologies; and nontraditional projects such as landfills and riparian buffers.
Community Assistance Program State Support Services Element (CAP-SSSE)	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 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-affected 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 and Recreation Lands, 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.
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.
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.
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: 1. The degree to which a given alternative mode, management strategy, design or location is economically justified. 2. The degree to which such an alternative is considered preferable from an environmental or social perspective. 3. The degree to which eventual construction and operation of such an alternative can be financed and managed.
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 (FEMA). 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 - To 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: (1) elevation, relocation, or demolition of insured structures; acquisition of insured structures and property; (2) dry flood proofing of insured structures; (3) minor, localized structural projects that are not fundable by State or other Federal programs (e.g., erosion-control and drainage improvements), (4) beach nourishment activities such as planting of dune grass. 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. The FHCF Zip Code is 32024, County Code is 1, Rating is 23 for Columbia County.
Grants & Loans for Public Works & Development Facilities, Economic Development Administration	To provide financial assistance for the construction of public facilities needed to initiate and encourage the creation or retention of permanent jobs in the private sector in designated areas where economic growth is lagging.
Hazard Mitigation Grant Program (HMGP)	This 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 (FEMA), 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.
Pollution Prevention Grants Program	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 Essential Highways and Highway Bridges, and Public Works	Through the U.S. Army Corps of Engineers -To provide bank 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 Program (RFC)	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	The Residential Construction Mitigation Program (RCMP) receives $7 million annually from the Florida Hurricane Catastrophe Trust Fund (ch. 215.559, Florida Statutes): $2.8 million is designated for the Mobile Home Tie-Down Program. Based on legislative directive the Division of Emergency Management provides the funding directly to Tallahassee Community College (TCC). By statute, TCC prepares a separate report for the Governor and the Legislature on these directives $700,000 is designated for Hurricane Research to be conducted by Florida International University (FIU) to continue the development of an innovative research of a full-scale structural testing to determine inherent weakness of structures when subjected to categories 1 to 5 hurricane-force winds and rain, leading to new technologies, designs and products. $2,467,389.00 is to be used to improve the wind resistance of residences through loans, subsidies, grants, demonstration projects, direct assistance, and cooperative programs with local and federal governments. The program is developed in coordination with Advisory Council whose members consist of representatives from the Florida Association of Counties, the Florida Department of Insurance, the Federation of Manufactured Home Owners, the Florida Manufactured Housing Association, the Florida Insurance Council, and the Florida Home Builders Association.

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: 1. 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 2. 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	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 such as plant closings, military base closures and defense contract cutbacks, and natural disasters (SSED), or from long-term economic deterioration in the area's economy (LTED). 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

(SSED) and Long Term Economic Deterioration (LTED)	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, the District of Columbia, 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 Program (STP)	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 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	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 Actions

It is anticipated that the county, municipalities within the county, and private not-for-profit corporations with actions 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 contained in the LMS as well as the functions they provide.

Columbia County Department of Emergency Management
The Columbia County Department of Emergency Management is the lead agency responsible to develop and maintain the LMS. This includes annual and 5-year updates and continual maintenance of the LMS mitigation project list. In addition, the department is responsible for the direction for the county communities in preparing for, responding to, recovering from and mitigating against natural, technological and man-made hazards. The Director of Emergency Management 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 and City Building, and Zoning Departments
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 Vice Chair of the LMS Committee/Workgroup, County Planner 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 and City Fire Departments
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 Assistant 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 School Board
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 Director of Purchasing 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 and City Public Work Departments
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 County Engineer 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 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 Department of Transportation
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 District Two 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.

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 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.

Utility Company
Review and offers recommendations in regard to City subdivision plans and requirements. The Utility Company 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 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.

United Way of Suwannee Valley
Works with the Suwannee Valley Homeless Coalition and local churches to secure temporary warming shelters for the homeless and others without heat when temperatures fall below 35 degrees Fahrenheit.

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 Columbia 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. Natural Hazards and other processes, like erosion, continually alter hazard prone areas.

There have been *some significant changes in development* in Columbia County since the last LMS plan was approved. Three fire stations have been added to the county:

1. Station 49 at CR 18 located in *Ft. White*
2. Station 50 on Mershon located North of *Lake City*
3. Station 51 on Lake Jeffrey Road, located in *Unincorporated Columbia County*, just outside of Lake City

All three fire stations are mobile home units/stations and will decrease the vulnerability for each jurisdiction. The county LMS Plan was revised and updated to reflect changes in local mitigation efforts and priorities.

In addition, the vulnerability for the county has been reduced and progress has been made due to the mitigation projects that have been completed over the past several years especially the stormwater

projects that address the flood, erosion and sinkhole hazards and the completion of the county's CWPP for the wildfire hazard.

Status Update on the County's Mitigation Projects

Completed Mitigation Projects

Columbia County has completed various mitigation projects over the past several years, especially several stormwater projects that were deemed necessary since Tropical Storm Debby. These projects mitigated flooding, sinkhole and erosion hazards that are vulnerable in the unincorporated areas of the county. In addition, several other completed projects addressed hurricanes, tropical storms, riverine erosion, wildfire, and drought/heat wave events that present vulnerability. (See Table 6.1 – Completed Mitigation Projects over the last five years).

Deleted Mitigation Projects

Over the last 5 years, the LMS Committee/Workgroup have analyzed specific mitigation projects that were considered not applicable to the strategy of the LMS and after careful discussion by the group, were deleted from the LMS project or initiative list.

New, Ongoing, and Deferred Mitigation Projects

This list is the "current" LMS project list for the county. There are identified new mitigation projects and the current mitigation projects that are considered ongoing and deferred due to funding at the time.

For specific details on each of the mitigation project lists (completed, deleted, or new, ongoing and deferred) are located in the Columbia County Local Mitigation Strategy Project Master List, excel attachment.

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 Attachment I, the Columbia County Local Mitigation Strategy Project Master List.

Table 6.1 – Mitigation Projects Completed (2010 – 2015)

Jurisdiction	Mitigation Project or Initiative	Hazard Mitigated	Scope of Work
Columbia County	Emergency Operations Center Expansion	All Hazards	Expand the County Emergency Operations Center.
Columbia County	Additional EOC Damage Assessment Staff	All Hazards	Recruitment and training of additional Emergency Operations Center Damage Assessment Staff.
Columbia County	School Core Area Sheltering	All Hazards	Encouragement the school district to, when building new schools, install backup generators and hurricane shutters.
Columbia County	Emergency Shelter Retrofit - Fort White High School	All Hazards	Install hurricane shutters on high school cafeteria building.
Lake City	Emergency Shelter Retrofit - Lake City Middle School	All Hazards	Install hurricane shutters.
Lake City	Emergency Shelter Retrofit - Summers Elementary School	All Hazards	Install hurricane shutters.
Columbia County	Emergency Shelter Retrofit - Columbia City Elementary School	All Hazards	Install hurricane shutters and backup electrical generator.
Columbia County Fort White Lake City	Annual Pew-Hurricane Season Elected Officials Meeting	Hurricanes and Tropical Storms	An annual pre-hurricane season meeting with elected officials and department heads to familiarized important decision makers with emergency operations and procedures during and immediately after hurricane events.
Columbia County Fort White Lake City	Comprehensive Plan Maintenance	Hurricanes and Tropical Storms, Flooding, Tropical and Riverine Erosion	Maintain current local government comprehensive plan requirements for 75-foot natural vegetated buffers from the Ichetucknee and Suwannee Rivers: 50-foot natural vegetative buffers from all other perennial rivers, streams and creeks.
Columbia County	FEMA FIRM Map Updates	Hurricanes and Tropical Storms, Flooding	Amend County Comprehensive Plan to include updated Federal Emergency Management Agency Flood Insurance Rate Maps when available.

Columbia County Fort White Lake City	FEMA FIRM 1-foot Elevation	Hurricanes and Tropical Storms, Flooding	Continue local government participation in the Federal Emergency Management Agency National Flood Insurance Program and require all habitable structures built within the 100-year flood prone areas be elevated no lower than 1-foot above the base flood elevation.
Columbia County Fort White	Comprehensive Plan Maintenance - 100-year Floodplains	Hurricanes and Tropical Storms, Flooding	Maintain local government comprehensive plan policies, which limit the allowable use and intensity of use of lands within the 100-year flood plains of the Ichetucknee and Suwannee Rivers as Environmental Sensitive on the future Land Use Plan Map.
Columbia County Fort White Lake City	Stormwater Utility	Hurricanes and Tropical Storms, Thunderstorms, Flooding	Implement a stormwater utility for drainage improvements.
Columbia County	Comprehensive Plan Floodable Areas	Hurricanes and Tropical Storms, Flooding	Development special overlay districts with higher development standards in areas located outside FEMA firms. Map 100-year flood plains, which are known to have been flooded during the 2004 hurricanes.
Columbia County Fort White Lake City	Public Education Program - Disaster Prevention	All Hazards	Update County website to include an education program for homeowners and businesses regarding disaster prevention and mitigation.
Columbia County	Records Maintenance - News Events	All Hazards	Maintain a historical record of natural disasters and disaster-related news events to assist in documenting natural hazards. Maintain a geographic information system-based inventory of repetitive loss structures.
Columbia County Fort White Lake City	First Responder Hazardous Materials Training	All Hazards	Conduct hazardous materials training programs for first respondents and operational level personnel.

Columbia County Fort White Lake City	Digital FEMA FIRM Maps	Hurricanes and Tropical Storms, Flooding	Incorporate into local flood[plain mitigation programs all updated and digitalized Federal Emergency Management Agency floodplain maps as they become available as a result of a Federal Emergency Management Agency Flood Map Modernization Program.
Columbia County Fort White Lake City	Repetitive Loss Resident Buyouts	Hurricanes and Tropical Storms, Thunderstorms, Flooding	Reduce or eliminate the long term risk of flood damage to residences with repetitive losses by retrofitting and/or elevating structures.
Columbia County	Community Wildfire Protection Plan (CWPP)	Wildfire	Work with the Florida Forest Service in completing the Columbia County CWPP.
Columbia County	Firewise Design Principles	Wildfire	Work with the Florida Forest Service to inform the public of Firewise building and landscape design principles.
Columbia County Fort White Lake City	Firewise Design Principles	Wildfire, Drought/Heatwave	Maintain local laws, which allow local government to enact burn bans during periods of drought.
Columbia County	Emergency Shelter Retrofit - Columbia City Elementary School	All Hazards	Install hurricane shutters and backup electrical generator.
Columbia County, Fort White	Stormwater Projects that were deemed necessary since Tropical Storm Debby - report submitted April 27, 2015	HAZARDS MITIGATED _ (Flood, Erosion, Sinkhole) - Unincorporated Columbia County - The stormwater projects were completed by the Public Works Department. Timeframe for completion - the projects were completed over a 2 1/2 year timeframe (August 2012 - April 2015). They are as follows: Hubble Street -, repair damaged pipe; Bauldree - construct pipe/gate value; Parkview Baptist Church - repair outfall ditch, erosion prevention; Columbia County Senior Services - outfall repair of stormwater pond; CR252-CHS parking - construct site and stormwater for school expansion; SW Sweetbreeze - construct inlet/pipe system; Sports Hall of Fame - outfall repair of stormwater pond; Old Jacksonville Highway - repair ditch, add slide drain; Emerald Forest Pond - construct stormwater pond to alleviate flooding; SW Hillcrest - construct pond, ditches to prevent future erosion; SE Forest Pond - construct stormwater pond to alleviate flooding; NE Birdie Street - repair lift station, maintenance on system; CR 252B and Jeff	

		Davis Lane - repair cross drain; Melrose Park Drainage - construct stormwater system to assist with localized flooding; NW Auburn Pl - construct swale, cross drain maintenance; SW Beth - Pipe failure, replace inlets, pipes, and road repair; Pine Knoll Pond - construct pond, pumping station; String of Lakes - clean outfall leading to Brown Road cross drain; CR250E - overall stormwater maintenance, cross drains, side drains; Brown Road Culvert - clean cross drain, construct roadside swale; Sept Storm - Sept. storm event, approximately 2 weeks pumping operations; Storm recover - 1 week, pump maintenance/repair, and preparation of next event; Scenic Lake Drive - repair erosion resulting from storm event; Drainage easements CR252W - overall stormwater maintenance, cross drains, side drains, easements; Lake Jeffrey Fire Station Pond - construct pond for new fire station parking areas; Parnell Rd - erosion repair and prevention; Old Wire/Herlong Pond - repair pond and erosion; Hubble Street - construct ditch from Hubble street to pond; Whistle Loop - ditch work, pipe extensions and MES; Egret - stormwater maintenance; Brinkley - construct berm and overflow; Columbia City - sinkhole repair; Mayo Road - overall stormwater maintenance, culverts, side drains; Natalie Street - cross drain replacement; Birdie Street - stormwater pump station improvements/repairs; Christie Rd - sediment removal from roadside swales; Mallard Ct - swale construction; Harris Lp - repair erosion; Palmetto Blvd - replace cross drain; Landfill - retaining wall construction - Town of Ft. White - Ichetucknee Avenue - overall stormwater maintenance, culverts, side drains.

Plan Maintenance and Evaluation

The Columbia County Department of Emergency Management Director in conjunction with the Columbia County LMS Committee/Working Group coordinates the following process for monitoring, evaluating, and revising the LMS Plan over the next five years.

Every year the LMS Committee/Working Group will meet at least once an annual basis 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; and
- Changes to the 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 Committee/Working Group may chose 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 Committee/Workgroup 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 Committee/Working Group will utilize this information and evaluate the goals, objectives, and actions contained in the LMS to determine if they are still applicable. The most recent review and discussion on the LMS Goals and Objectives was at the *October 14, 2014* meeting and selected details were updated and the remaining goals were determined that they meet the needs for the County.

Also, 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 changes. The updated LMS plan will become available online at examiner.com to give the public an opportunity to review the document prior to the final plan approval.

Upon final coordination between these groups and formal approval from FDEM, the updated Local Mitigation Strategy will be presented to the Board of County Commissioners and the governing bodies of the municipalities for their approval and adoption.

Incorporation into Existing Planning Mechanisms

When feasible, the local governments should incorporate 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. Local governments will consider new information and policy guidance provided in the LMS in their next evaluation and appraisal report for amendments to their comprehensive plans. The last Evaluation and Appraisal Report for the County was submitted to the Florida Department of Economic Opportunity (FDEO), Proposed Amendment No. CPA, 13.01 Evaluation Amendments on August 22, 2013; the Town of Fort White in October 2009; and the City of Lake City in April 1, 2010. Amendments to local government comprehensive plans to implement recommendations contained in the reports are anticipated to be adopted by the local governments within one year of approval of their Evaluation and Appraisal Reports. Amendments to implementing regulations and ordinances necessary to implement the comprehensive plan amendments are anticipated to occur within one year after approval of the comprehensive plan amendments.

Section 163.3 177, Florida Statutes, requires local government comprehensive plans to include a capital improvements element and a 5-year schedule of capital improvements. Furthermore, Section 163.3 177 (3)(b), Florida Statutes, requires the capital improvements element to be reviewed and modified as necessary on an annual basis. In addition, that statue mandates that the identified improvements be consistent with the plan and that all public facilities shall be consistent with the capital improvements element. Therefore, all identified capital improvement projects contained in the LMS, which are anticipated to be implemented within the next five years should be considered for incorporation into capital improvements element on an annual basis.

The LMS is intended to provide the local communities an opportunity to implement across planning boundaries. There are a variety of ways that the LMS has incorporated elements of other planning mechanisms and programs in addition to related mechanisms and program that have integrated components of the LMS.

A. Suwannee River Water Management District Strategic Plan 2009 – 2018

- ✓ Community-Based Flood Management
  SRWMD is in cooperation with FEMA, which has provided federal funding for FEMA flood rate map modernization. These maps provide data for local development regulations and help communities avoid flood hazards from new development. SRWMD will continue to develop accessible and accurate floodplain data for all communities (SRWMD Strategic Plan, pg 5). The updated maps are used for Columbia NFIP and CRS activities.

- ✓ Land Acquisition
  Acquiring land for nonstructural flood protection through the "Excellence in Land Management Program," (Strategic Plan, pg 13). When appropriate the acquisition projects should be included on the LMS list of mitigation actions or projects.

- ✓ Resource Monitoring and Reporting
  - SRWMD will improve water management through monitoring water quality and quantity in natural systems. The data collected will serve as an information source for developing Minimum Flow Level's, regulatory programs, land management, and flood protection (Strategic Plan, pg 5).
  - Groundwater and surface water levels and rainfall networks are collected at numerous sites around the District. River levels and rainfall data are provided to the National Weather Service for use in flood forecasting. During flood events, the District is a primary source of flooding information for the public (Strategic Plan, pg 9).

- ✓ Regulatory Programs
  - SRWMD will continue to implement district rules to protect resources and ensure minimal impact. Permits are required for all activities that affect water quality, flooding and stormwater management, water supplies, and impacts to water related natural systems (Strategic Plan, pg 6).

B. Columbia County Capital Improvements

- ✓ Serves as a means to monitor and evaluate the effectiveness of Columbia County's Planning Program
- ✓ Helps the county in maintaining a consistent level of service standards for public facilities and recreation
- ✓ The Capital Improvements Element strives to remain consistent with other elements in the Comprehensive Plan, particularly the Future Land Use Element.

C. Columbia County CRS and Floodplain Ordinance

- ✓ Columbia County's current floodplain ordinance was amended December 30, 2008 to meet 44 Code of Federal Regulations Section 60.3(b) of the National Flood Insurance Program.

- ✓ The Emergency Operations Center of Columbia County works closely with the Building and Zoning Department to map areas that are prone to frequent floods and track repetitive loss properties. After a disaster all damaged structures are inspected and the damage documented. Repetitive loss properties are purchased utilizing grant monies whenever possible.
- ✓ Columbia County maintains a variety of outreach programs to ensure residents can easily access flood information and remain informed about the latest issues surrounding flood management.
  - The county library maintains a wealth of information for the public to educate themselves on flood issues, which include retrofitting, safety, insurance, maps, historical data, and many other sources of information.
  - The county developed and distributed a booklet for residence and property owners to provide important information regarding the risk of floods in Columbia County.

D. Columbia County Land Development Regulations

- ✓ Article 4 – Zoning Regulations
  - Columbia County attempts to limit development in flood prone areas by requiring all structures (with the exception of permitted docks, walkways, a piers) to be set back a minimum of 35 feet from wetlands, 75 feet from the Suwannee, Santa Fe, and Ichetucknee Rivers, and 35 feet from all other perennial rivers, streams, and Creeks (Sec. 4.3.7, 4.4.7, 4.6.7, 4.7.7, 4.8.7, 4.9.7, 4.10.7, 4.11.7, 4.12.7, 4.13.7, 4.14.7, 4.15.7, 4.16.7, 4.17.7, 4.18.6, 4.18.12, 4.19.6, 4.19.12, 4.20.7).
  - Columbia County restricts development of environmentally sensitive areas “ESA” defined as districts with land used to “ provide mitigating measures to protect the natural functions of areas which are limited to the planning and treatment of land development within the 100-year floodplain of the Ichetucknee Springs State Park, O'Leno State Park, Osceola National Forest, Pinhook Swamp, Suwannee River Corridor, Santa Fe River Corridor and Ichetucknee Trace, as designated within the FEMA flood insurance rate map for the county.” These regulations prohibit intensive residential, intensive recreational and intensive agricultural uses and prohibit industrial and commercial development within the 100-year floodplain of the areas designated as environmentally sensitive areas (Sec 4.4.1).
  - Columbia County mitigates the potential for fires by requiring industrial zoned districts with bulk storage yards (including bulk storage of flammable liquids) to be subject to provisions of local and state fire codes (Sec. 4.17.5).
  - Site analyses are required for all planned residential developments in order to identify flood prone areas (Sec 4.18.6, 4.19.6).

- ✓ Article 5 – Subdivision Regulations
  - Columbia County requires that subdivided land shall prevent periodic and seasonal flooding by providing adequate protective flood control and drainage facilities (Sec 5.2.2).

- Land which the Board of County Commissioners finds to be unsuitable for subdivision development due to flooding, improper drainage, steep slopes, rock formations, adverse earth formations or topography, utility easements, or other features which will reasonably be harmful to the safety, health, and general welfare of the present or future inhabitants of the subdivision and/or its surrounding areas shall not be subdivided or developed unless adequate methods are formulated by the subdivider and approved by the Board of County Commissioners to solve the problems created by the unsuitable land conditions (Sec 5.5).
- Preliminary subdivision plats are required to document natural features, including lakes, marshes or swamps, water courses, wooded areas, and land subject to the 100-year flood as defined by the FEMA official flood maps (Sec. 5.33, 5.36)

✓ Article 7 – Stormwater Management Regulations
- Actions taken under emergency conditions to prevent imminent harm or danger to persons, or to protect property from imminent fire, violent thunderstorms, hurricanes/tropical storms, or other hazards is exempt from land development regulation. A report of the emergency action to the board of county commissioners and water management district is required as soon as possible (Sec. 7.2.1).

✓ Article 8 – Flood Damage Prevention Regulation (review the CRS data above)
- Columbia County maintains a set of floodplain regulations that are designed to restrict, protect, control, and prevent or regulate flooding throughout the County (Sec 8.1.3).

✓ Article 12 – Appeals, Special Exceptions, Variances
- The Board of County Commissioners may permit modifications in the minimum standards of design set forth within flood damage prevention regulations. The Land Development Regulation Administrator shall maintain the records of all variance actions and report any variances to the FEMA upon request (Sec 12.3.3).

✓ Article 14 – Permitting and Concurrency Management
- Mining which will result in an adverse effect on environmentally sensitive lands, such as wetlands and floodplains is prohibited (Sec 14.7).

E. Columbia County Comprehensive Plan 2023

✓ Future Land Use Element
- In moving forward, Columbia County will continue to preserve environmentally sensitive areas (within the areas of the 100-year flood, as designated by the FEMA flood insurance rate map dated January 6, 1988, and located in the Santa Fe River corridor, Suwannee River corridor, Olustee Creek corridor and Ichetucknee trace). All developments in these areas will maintain a 75- foot undisturbed buffer from a perennial river, stream or creek and a minimum 50-foot

setback from a lake, pond or wetland and all of the developed area will remain outside of floodplains and wetlands (Policy I.1.6, I.2.2).
- As part of the county's development review process, environmentally sensitive land (including flood prone areas) shall be identified for protection. (Policy I.7.4)

✓ Housing Element
- In attempting to achieve its commitment to safe, affordable housing, Columbia County will prohibit future government subsidized housing in areas with the 100-year floodplain, as designated by the FEMA flood insurance rate map (Policy III.1.2).

✓ Conservation Element
- In order to develop land use in potentially hazardous location, Columbia County will continue to regulate development within the 100 year floodplain. In addition, the county shall participate in the NFIP 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-flood prone portion of a site. Where the entire site is in a flood prone area, or an insufficient buildable area on the non-flood prone portion of a site exists, all structures located in floodplains shall be elevated no lower than one foot above base flood elevation. Where the entire site is in a flood prone area or an insufficient buildable area on the non-flood prone portion of site exists, all structures located in areas of shallow flooding shall be elevated at least two feet above the highest adjacent grade (Policy V.2.8).

F. City of Lake City COMP

- Policy V.2.6 The City shall continue to 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 structures 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-flood prone portion of a site exists, all structures, located in flood plains, 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 nonfloodprone portion of site exists, all structures, located in areas of shallow flooding shall be elevated at least two feet above the highest adjacent grade.
- Policy V.2.8 The City shall conserve wetlands by prohibiting, where the alternative of clustering

all structures in the non-wetland portion of the site exist, any development or dredging and filling which would alter their natural functions. Residential dwelling units not more dense than 1 dwelling unit per 5 acres subject to the following minimum performance standards:
1. Residences and any support buildings shall be built on pilings of sufficient height to exceed by 1 foot the highest recorded flood level in the wetland. If there is no flooding data available, residences and any support buildings shall be built at least 2 feet above the highest seasonal water level;

- Policy V.4.5 The City shall address, during the development review process, the mitigation of development activities within environmentally sensitive areas, which include but are not limited to those areas identified as environmentally sensitive areas, on the FLUM of this Comprehensive Plan to ensure that the possible impacts created by the proposed development activity will not significantly alter the natural functions of these significant natural resources. All new development will 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 impact and recreation value of these areas is maintained.

G. Town of Ft. White

In reference to the Town of Ft. White and their participation of related planning mechanisms – the Town of Ft. White participates in all LMS activities and mitigation projects or initiatives including adopting resolutions in the LMS Plan. Per the building and zoning department, the plans related to Ft. White are in the updating stage for review and analysis.

Continued Public Involvement

The Columbia County LMS Committee/Working Group will hold 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 will be 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 will be advertised on the online websites and in the following printed newspapers prior to each meeting inviting the public to attend and participate:

- Columbia County Department of Emergency Management website: http://www.columbiacountyem.com/
- Columbia County Department of Emergency Management Facebook: https://www.facebook.com/pages/Columbia-County-Florida-Emergency-Management/353463268093780

- The Columbia County Observer: http://www.columbiacountyobserver.com/
- The Lake City Reporter: http://www.lakecityreporter.com/
- The Suwannee Valley Times: http://www.suwanneevalleytimes.com/

The LMS Committee will provide an alternative method for those interested in the county mitigation efforts, and are unable to attend the LMS meetings, an opportunity to review the plan and submit formal comments. A draft LMS Plan, meeting notices, agendas, minutes, and any other relevant materials presented at the county LMS meetings will be available for review at the Columbia County Department of Emergency Management office.

Comments can be submitted in writing to:

Columbia County Department of Emergency Management
Attn: Emergency Management Director
P.O. Box 1787
Lake City, FL 32056

In addition, a draft of the LMS Plan will also be available on the EM website:

http://www.columbiacountyem.com

The LMS Working Group will hold at least one public meeting to solicit formal comments from the public prior to the final plan approval. After approval by the County LMS Committee, 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 Committee/Workgroup will present the updated plan to the County Commission as well as the Commissions of the City of Lake City and the Town of Fort White 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.

Appendices

Appendix I – Columbia County's LMS meeting documentation over the last five years including (i.e. meeting advertisement or public notice, agenda, sign-in sheets, and meeting minutes).

Appendix II - The Columbia County Community Wildfire Protection Plan.

Appendix III – The Repetitive Loss Map and a Special Flood Hazard Map with Conservation Land for the County.

Appendix IV – Article on Roads and Neighborhoods in Columbia County Prone to Flooding.

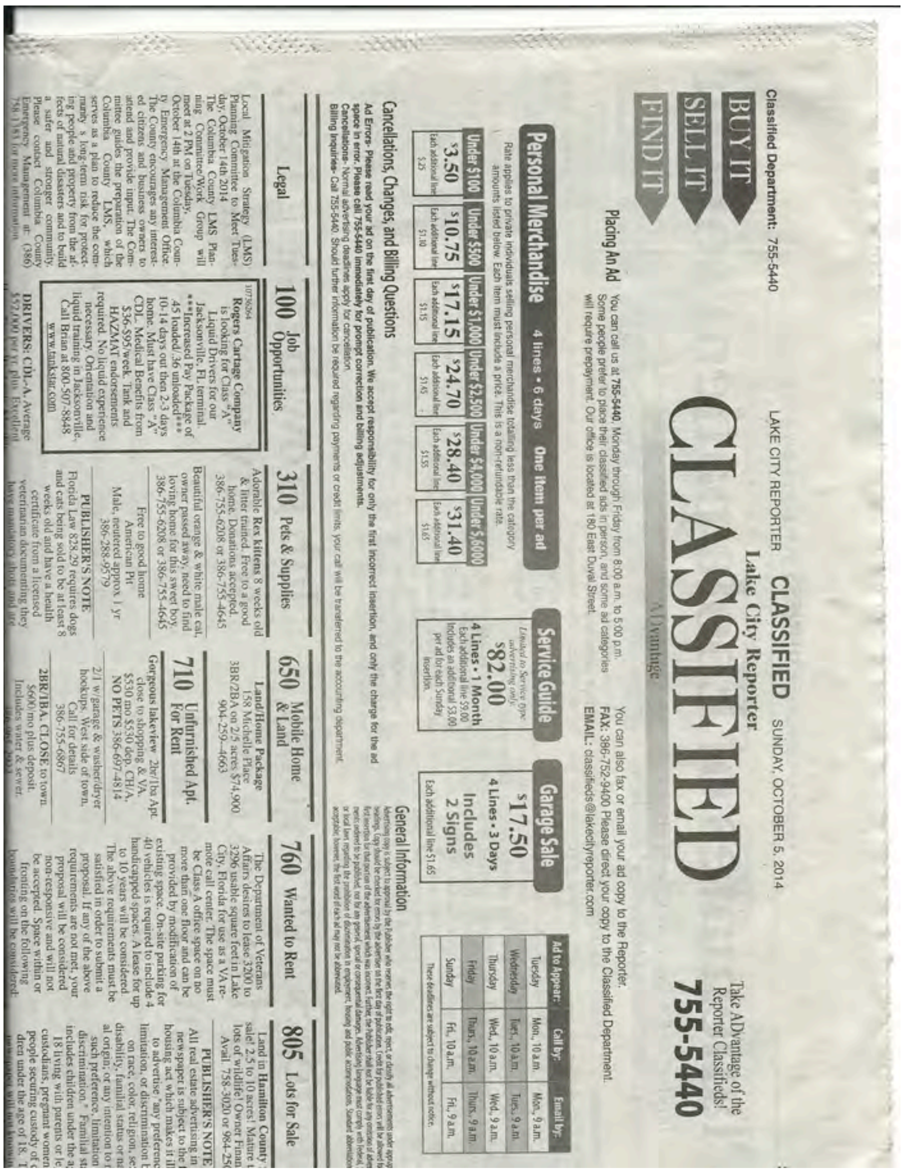
Appendix V - Article 8 – Flood Prevention Damage Regulations from the County Land Development Regulations.

Appendix VI – Flood Mitigation Outreach Material for the County Residents

Appendix I - Columbia County LMS Meetings (Advertisement, Agenda, Minutes, Sign-In Sheets)

(A) Meeting Date: October 14, 2014

A1 - Advertisement



Classified Department: 755-5440

LAKE CITY REPORTER CLASSIFIED SUNDAY, OCTOBER 5, 2014

BUY IT SELL IT FIND IT

CLASSIFIED

Lake City Reporter

Take ADvantage of the Reporter Classifieds!

755-5440

Placing An Ad

You can call us at 755-5440, Monday through Friday from 8:00 a.m. to 5:00 p.m. Some people prefer to place their classified ads in person, and some ad categories will require prepayment. Our office is located at 180 East Duval Street.

You can also fax or email your ad copy to the Reporter. FAX: 386-752-9400 Please direct your copy to the Classified Department. EMAIL: classifieds@lakecityreporter.com

Personal Merchandise 4 lines • 6 days One item per ad

Under $100	Under $500	Under $1,000	Under $2,500	Under $4,000	Under $6,000
$3.50	$10.75	$17.15	$24.70	$28.40	$31.40

Service Guide: $82.00, 4 Lines • 1 Month

Garage Sale: $17.50, 4 Lines • 3 Days, Includes 2 Signs

Cancellations, Changes, and Billing Questions

Ad Errors- Please read your ad on the first day of publication. We accept responsibility for only the first incorrect insertion, and only the charge for the ad space in error. Please call 755-5440 immediately for prompt correction and billing adjustments.

Legal

Local Mitigation Strategy (LMS) Planning Committee to Meet Tuesday, October 14th 2014

The Columbia County LMS Planning Committee/Work Group will meet at 2 PM on Tuesday, October 14th at the Columbia County Emergency Management Office. The County encourages any interested citizens and business owners to attend and provide input. The Committee guides the preparation of the Columbia County LMS, which serves as a plan to reduce the community's long-term risk for protecting people and property from the affects of natural disasters and to build a safer and stronger community. Please contact Columbia County Emergency Management at: (386) 758-1383 for more information.

100 Job Opportunities

Rogers Cartage Company is looking for Class "A" Liquid Drivers for our Jacksonville, FL terminal. ***Increased Pay Package of .45 loaded/.36 unloaded*** 10-14 days out then 2-3 days home. Must have Class "A" CDL. Medical Benefits from $36-$95/week. Tank and HAZMAT endorsements required. No liquid experience necessary. Orientation and liquid training in Jacksonville. Call Brian at 800-507-8848 www.tankstar.com

A2 - Agenda

Columbia County
Local Mitigation Strategy (LMS) Meeting
October 14, 2014

I Welcome and Introductions

II LMS Committee/Workgroup Members

III LMS Mitigation Project or Action List
What is the status update or progress of the LMS mitigation projects?

IV LMS Goals, Objectives and Policies
Do they meet the needs for the County?
Are there any changes to be reported for the next LMS plan update?

V Yearly planning for the LMS
What steps are occurring each year to meet the requirements for the next LMS annual plan update?

VI Adjourn

A3 - Sign-In Sheet

Columbia County Local Mitigation Strategy (LMS)
Meeting Sign-In Sheet – October 14, 2014

Name	Organization/Company	E-Mail	Phone
ED WARD	FDOT	ED.WARD@DOT.STATE.FL.US	386-961-7581
Scott R[illegible]	Columbia [illegible]	[illegible]	[illegible]
Jeff Crawford	CCFR	Jeff_Crawford@ColumbiaCountyFla.Com	758-3907
DOC BLOODWORTH	FL Forest Service	doc.bloodworth@FreshFromFlorida.Com	386-758-5706
Bob Hathcox	City of Lake City	hathcoxb@lcfla.com	386 719 5752
Laura Reissener	City of Lake City	reissenerl@lcfla.com	386-719-5754
Emily Buchanan	Lake City Reporter	ebuchanan@lakecityreporter.com	386-754-0426
Roselle Derequin	Red Cross	roselle.derequito@redcross.org	352-339-1474
Amara Fazal	Red Cross	Amara.Fazal2@redcross.org	352-339-3368
BRIAN KEPNER	Col. Co. Bld+Zoning	You know it	Same
Frank Armijo	LCFD.	armijof@lcfla.com	386-365-4475
PIPER Walton	FGC	piper.walton@FGC.edu	754-4442
RICK DAMON	CCSO	RICK.DAMON@COLUMBIASHERIFF[illegible]	386 7523222
James Brinkley	Lifeguard Ambulance Service	james.brinkley@lifeguardambulance.com	386-623-2024
JON LASH	~~Citizen~~		752-0987
Ron Croft	Columbia County 911 Addr/GIS	ron_croft@columbiacountyfla.com	386 758 1125
CHAD WILLIAMS	" " ENGINEER	chad_williams@columbiacountyfla.com	386 758 1019
R.M. "Mike" Null	Columbia County School District	nullm@columbia.k12.com	386 755-8024
Scarlet P. Frisina	BOCC – Commissioner	scarlet_frisina@columbiacountyfla.com	386-365-0687
Shayne Morgan	Columbia County EM	shayne_morgan@columbiacountyfla.com	386-758-1387

A4 - Meeting Minutes

Columbia County
Local Mitigation Strategy (LMS)
Meeting Minutes
October 14, 2014

I Welcome – Shayne Morgan, LMS Chair welcomed the members.

Vice Chair Brian Kepner was also present.

II LMS Committee Members & Guests Introduction – Shayne Morgan asked that all members introduce themselves. (Official sign-in sheet is provided as an attachment to these minutes).

III LMS Mitigation Project or Action List – the committee members went through each of the projects listed, updates were captured for each project. (The updated project list is provided as an attachment to these minutes).

IV Goals & Objectives – Two changes to the Goals & Objectives:

- Add the language from 1.9 to all perils
- Change Division of Forestry to Florida Forest Service

A motion was made by Ron Croft and seconded by James Brinkley to accept the project list and Goals & Objectives after revisions.

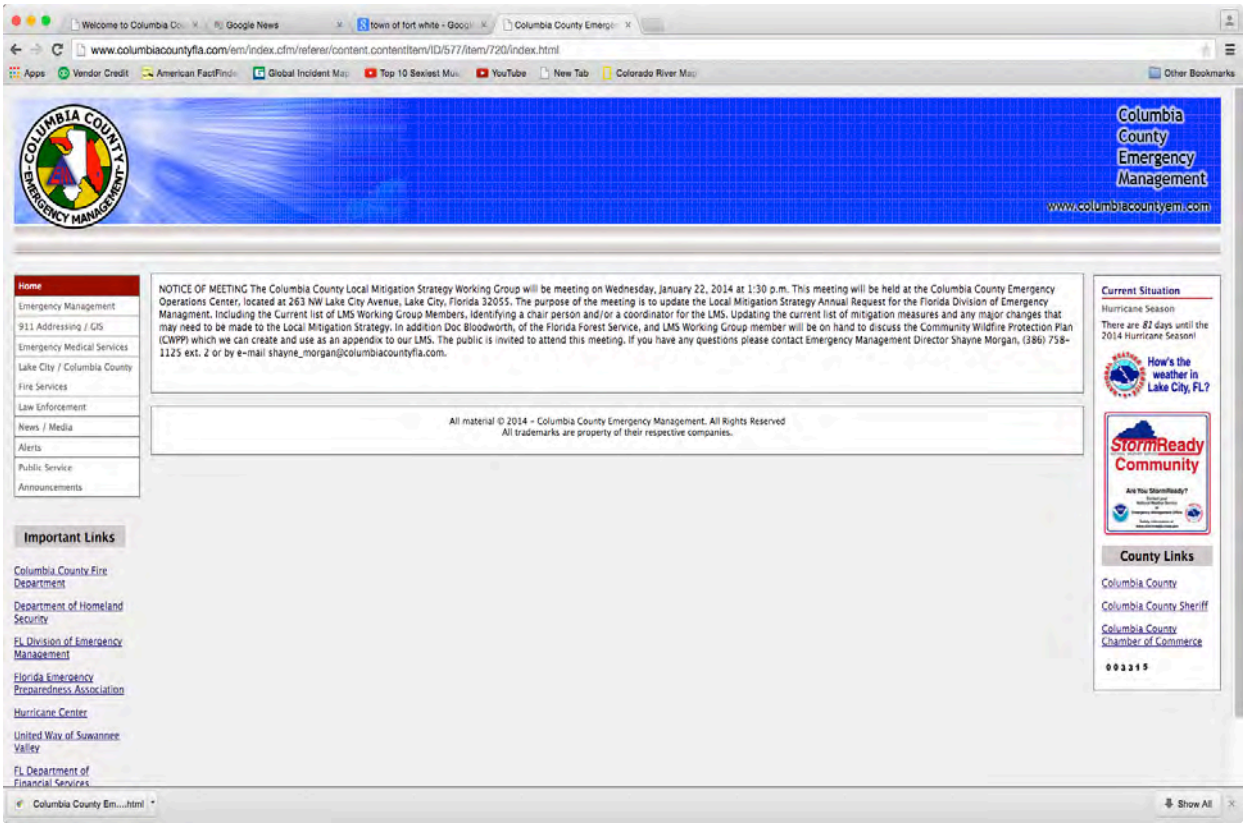
V Public Participation – The importance of including and educating the public on mitigation was discussed. Listed below are the activities being conducted by Columbia County:

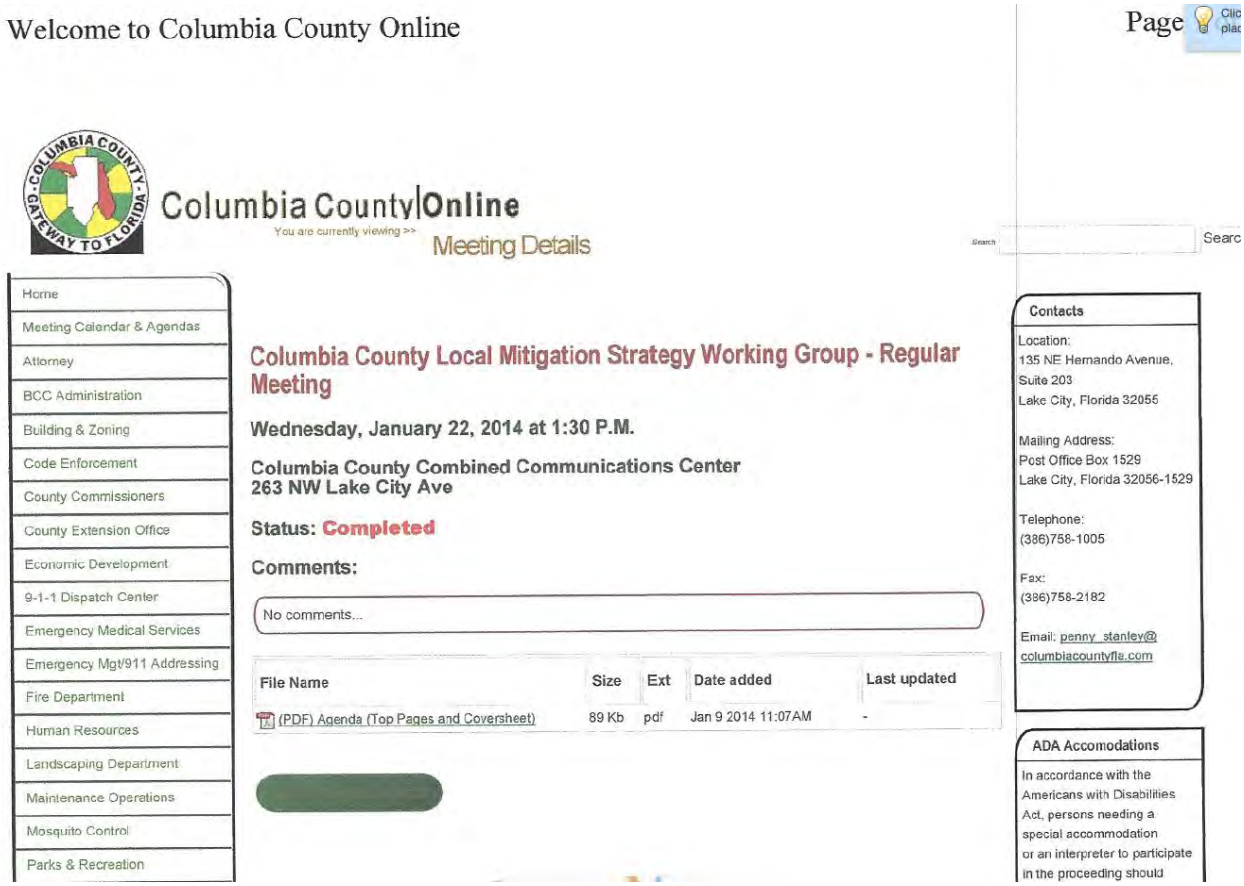
- Columbia County Department of Emergency Management advertises all LMS meetings in the local papers, informs residents via Social Media on Facebook and on the County Website.
- Florida Forest Service brings Smokey Bear to schools within the County to promote wildfire safety and Firewise.
- Press attends mitigation meetings and events and write articles to inform the citizens of activities being conducted
- First Responders conduct “show & tell” presentations at all the schools within Baker County.

V Adjourn – There being no further business, the meeting was adjourned.

(B) Meeting Date: January 22, 2014

B1 - Advertisement

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Emergency Mgt/911 Addressing
Fire Department
Human Resources
Landscaping Department
Maintenance Operations
Mosquito Control
Parks & Recreation
Columbia County Local Mitigation Strategy Working Group - Regular Meeting
Wednesday, January 22, 2014 at 1:30 P.M.
Columbia County Combined Communications Center
263 NW Lake City Ave
Status: Completed
Comments:
No comments...
File Name
Size
Ext
Date added
Last updated
(PDF) Agenda (Top Pages and Coversheet)
89 Kb
pdf
Jan 9 2014 11:07AM
-
Contacts
Location:
135 NE Hernando Avenue,
Suite 203
Lake City, Florida 32055
Mailing Address:
Post Office Box 1529
Lake City, Florida 32056-1529
Telephone:
(386)758-1005
Fax:
(386)758-2182
Email: penny_stanley@columbiacountyfla.com
ADA Accomodations
In accordance with the Americans with Disabilities Act, persons needing a special accommodation or an interpreter to participate in the proceeding should

B2 - Agenda

Columbia County Local Mitigation Strategy Working Group
January 22, 2014 1:30 p.m.
Columbia County Emergency Operations Center

I. Introductions
II. Nomination and Election of Chair
III. Nomination and Election of Coordinator
IV. Review current list of mitigation projects in current LMS
V. Any changes that need to be added/removed from current list
VI. Community Wildfire Protection Program (CWPP) -- Doc Bloodworth, Florida Forest Service
VII. Open Discussion
VIII. Adjournment

B3 - Sign-In Sheets

Columbia County Emergency Management
263 NW Lake City Avenue
Lake City, FL 32055

Meeting: Local Mitigation Strategy Meeting

Date/Time: January 22, 2014; 1:30 p.m.

NAME	AGENCY	PHONE	E-MAIL
Piper Dalton	FGC	625-1518	Piper.Dalton@FGC.EDU
Judy Tatem	CCSD	255-8192	TatemJ@ColumbiaK12.com
[illegible]	CCSO	758-1370	
Lt. Mark Boatwright	FHP	754-6271	Kennethboatwright@flhsmv.gov
BRIAN KEPNER	Col. Co.	754 7119	brian_kepner@columbiacountyfla.com
Frank E Armijo	L.C.F.D	758-5442	armijof@lcfla.com
Tony Britt	Lake City Reporter	754-0422	tbritt@lakecityreporter.com
DAVID L. BOOZER	CCFR	754-7071	david_boozer@columbiacountyfla.com
Timothy L. Westberry	LCFD	758-5444	westberryt@lcfla.com
Ronal N. Croft	CC Add/E25	758 1125	[illegible]

Columbia County Emergency Management
263 NW Lake City Avenue
Lake City, FL 32055

Meeting: Local Mitigation Strategy Meeting

Date/Time: January 22, 2014; 1:30 p.m.

NAME	AGENCY	PHONE	E-MAIL
Brian Kauffman	SRWMD	800 226 1066	bck@srwmd.org
David Kraus	Columbia County	386 623 6320	[illegible]@columbiacountyfla.com

Columbia County Emergency Management
263 NW Lake City Avenue
Lake City, FL 32055

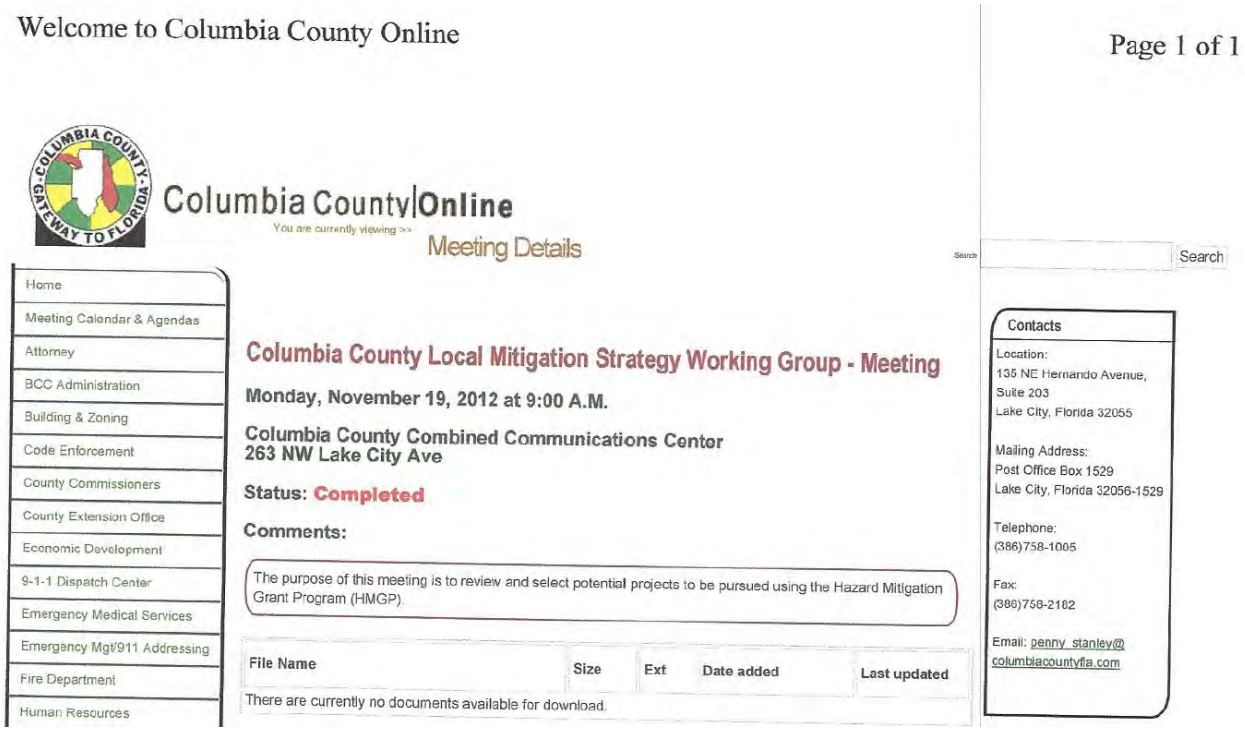
Meeting: Local Mitigation Strategy Meeting

Date/Time: January 22, 2014; 1:30 p.m.

NAME	AGENCY	PHONE	E-MAIL
Shayne Morgan	CCEM	758 1125	shayne-morgan@columbiacountyfla.com
Doc Woodworth	FL Forest Svc.	758-5706	doc.woodworth@FreshFromFlorida.com
ED WARD	FDOT	961-7581	ED.WARD@DOT.STATE.FL.US
TOM KLECKA	Red Cross	352-356-2063	tom.klecka@redcross.org
SANDRA KLECKA	Red Cross	352-356-2071	sandra.klecka@redcross.org
John Hampton	Red Cross	352 281-5180	johnhampton@redcross.org
Laura Reissener	City of Lake City	719 5754	laura@lcfla.com
ROBERT HATHCOCK	City of Lake City	719 5754	" " "
Terri Jenkins	US FWS Okefenokee NWR	912-313 4225	terri_jenkins@fws.gov
Jeffery Crawford	CCFR	758-3907	

Meeting Date: November 19, 2012

C1 - Advertisement



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- Emergency Medical Services
- Emergency Mgt/911 Addressing
- Fire Department
- Human Resources

Columbia County Local Mitigation Strategy Working Group - Meeting

Monday, November 19, 2012 at 9:00 A.M.

Columbia County Combined Communications Center
263 NW Lake City Ave

Status: Completed

Comments:

The purpose of this meeting is to review and select potential projects to be pursued using the Hazard Mitigation Grant Program (HMGP).

File Name	Size	Ext	Date added	Last updated

There are currently no documents available for download.

Contacts

Location:
135 NE Hernando Avenue,
Suite 203
Lake City, Florida 32055

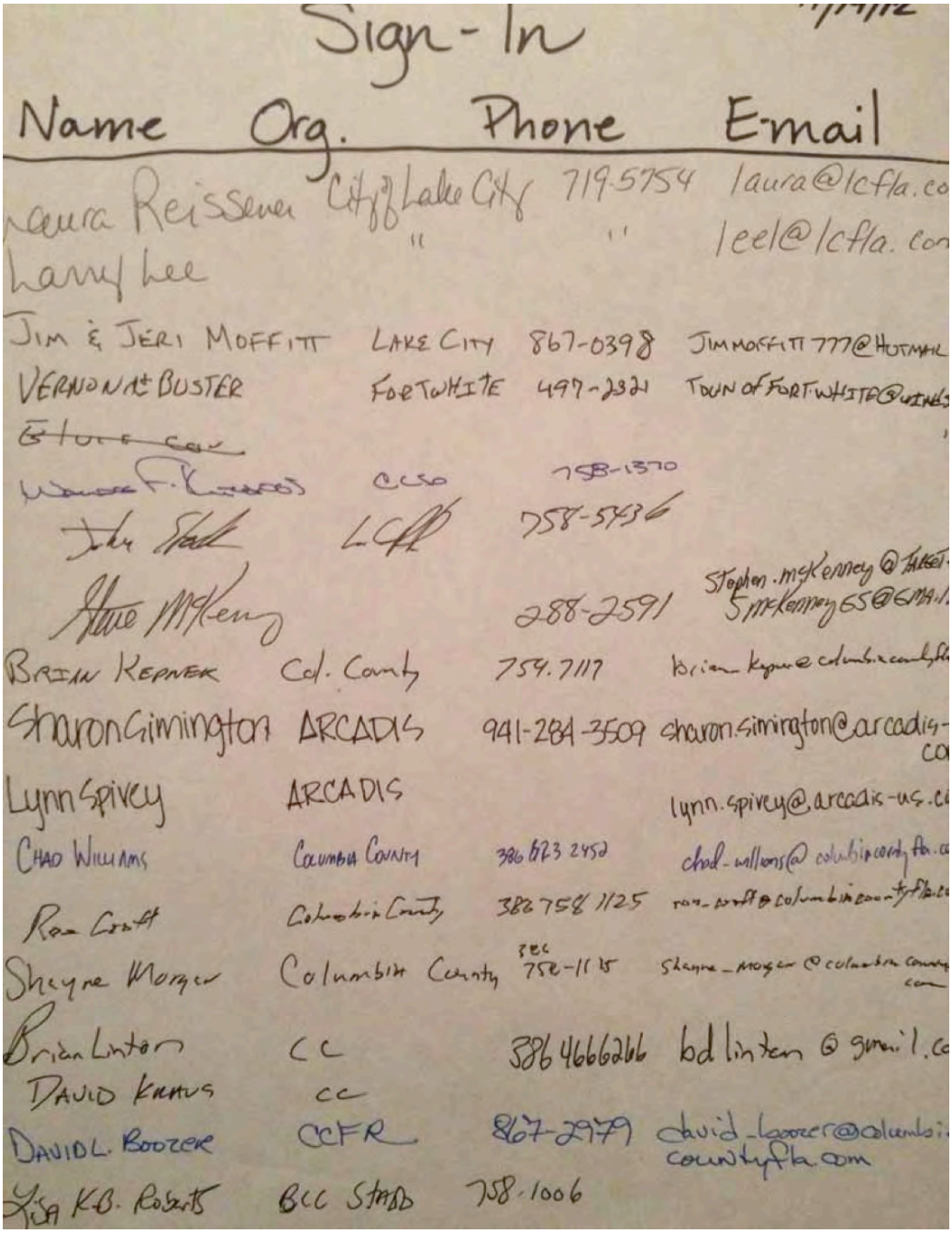
Mailing Address:
Post Office Box 1529
Lake City, Florida 32056-1529

Telephone:
(386)758-1005

Fax:
(386)758-2162

Email: penny_stanley@columbiacountyfla.com

C2 - Sign-In Sheet



Sign-In

Name	Org.	Phone	E-mail
Laura Reisseuer	City of Lake City	719-5754	laura@lcfla.co
Larry Lee	"	"	lee@lcfla.com
Jim & Jeri Moffitt	Lake City	867-0398	JimMoffitt777@Hotmail
Vernon "Buster"	Fort White	497-2321	Town of Fort White@gmail
~~Store car~~			
[illegible]	CCSO	758-1370	
[illegible]	LCFL	758-5436	
[illegible]		288-2591	Stephen.mckenney@[illegible]
Brian Kepner	Col. County	754.7117	brian.kepner@columbiacountyfla
Sharon Gimington	ARCADIS	941-284-3509	sharon.simington@arcadis-co
Lynn Spivey	ARCADIS		lynn.spivey@arcadis-us.co
Chad Williams	Columbia County	386 623 2450	chad_williams@columbiacountyfla.co
Ron Croft	Columbia County	386 758 1125	ron_croft@columbiacountyfla.co
Shayne Morgan	Columbia County	386 758-1125 ext	shayne_morgan@columbiacountyfla.com
Brian Linton	CC	3864666266	bdlinton@gmail.co
David Knaus	CC		
David L. Boozer	CCFR	867-2979	david_boozer@columbiacountyfla.com
Lisa K.B. Roberts	BCC Staff	758-1006	

Meeting Date: March 15, 2012

D1 - Advertisement

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Fire Department

Columbia County Local Mitigation Strategy Working Group - Meeting

Thursday, March 15, 2012 at 9:00 A.M.

Columbia County Combined Communications Center
263 NW Lake City Ave

Status: Completed

Comments:

No comments...

File Name	Size	Ext	Date added	Last updated
(PDF) Agenda (Top Pages and Coversheet)	219 Kb	pdf	Mar 5 2012 4:43PM	-

Contacts

Location:
135 NE Hernando Avenue,
Suite 203
Lake City, Florida 32055

Mailing Address:
Post Office Box 1529
Lake City, Florida 32056-1529

Telephone:
(386)758-1005

Fax:
(386)758-2182

Email: penny_stanley@columbiacountyfla.com

D2 – Sign- In Sheet

Columbia County
Local Mitigation Strategy
Working Group Meeting
March 15, 2012

NAME	AGENCY/ORG	PHONE	EMAIL
Shayne Morgan	CCEM	(386) 758-1383	Shayne_Morgan@columbiacountyfla.com
Ronald N. Croft	911 Addressing / GIS	386 758 1125	ron_croft@columbiacountyfla.com
Leroy Marshall	SRWMD	386 362 0440	lrm@srwmd.org
BRIAN KEPNER	Col. Co. Bld & Zoning	386 754 7119	brian_kepner@columbiacountyfla.com
Casey M. Schmelz	American Red Cross	(352) 281-5180	cschmelz@redcrossncfc.org

Meeting Date: May 19, 2011

E1 - Advertisement

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Planning & Zoning / Board of Adjust. *Regular Meeting* *Location: School Board Administrative Complex* **Comments:**	Date: Thursday, May 26 2011 Time: 7:00 P.M. Status: Scheduled	
911 Communications Committee *Regular Meeting* *Location: Emergency Operations Center* **Comments:** Regular Meeting	Date: Tuesday, May 24 2011 Time: 9:00 A.M. Status: Scheduled	
Columbia County Local Mitigation Strategy Working Group *Location: Emergency Operations Center* **Comments:** Columbia County is in the process of enhancing the Risk Assessment portion of our Columbia County Local Mitigation Strategy (LMS) this year. The risk assessment provides the foundation for our LMS strategy by identifying our communities' risks and vulnerabilities.	Date: Thursday, May 19 2011 Time: 9:00 A.M. Status: Completed	

Meeting Date: May 4, 2011

F1 – Advertisement

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Fire Department

Columbia County Local Mitigation Strategy Working Group -

Wednesday, May 4, 2011 at 9:00 A.M.

Columbia County Combined Communications Center
263 NW Lake City Ave

Status: Completed

Comments:

No comments...

File Name	Size	Ext	Date added	Last updated
(PDF) A Public Invitation to Participate	265 Kb	pdf	Apr 19 2011 4:14PM	-

Contacts

Location:
135 NE Hernando Avenue,
Suite 203
Lake City, Florida 32055

Mailing Address:
Post Office Box 1529
Lake City, Florida 32056-1529

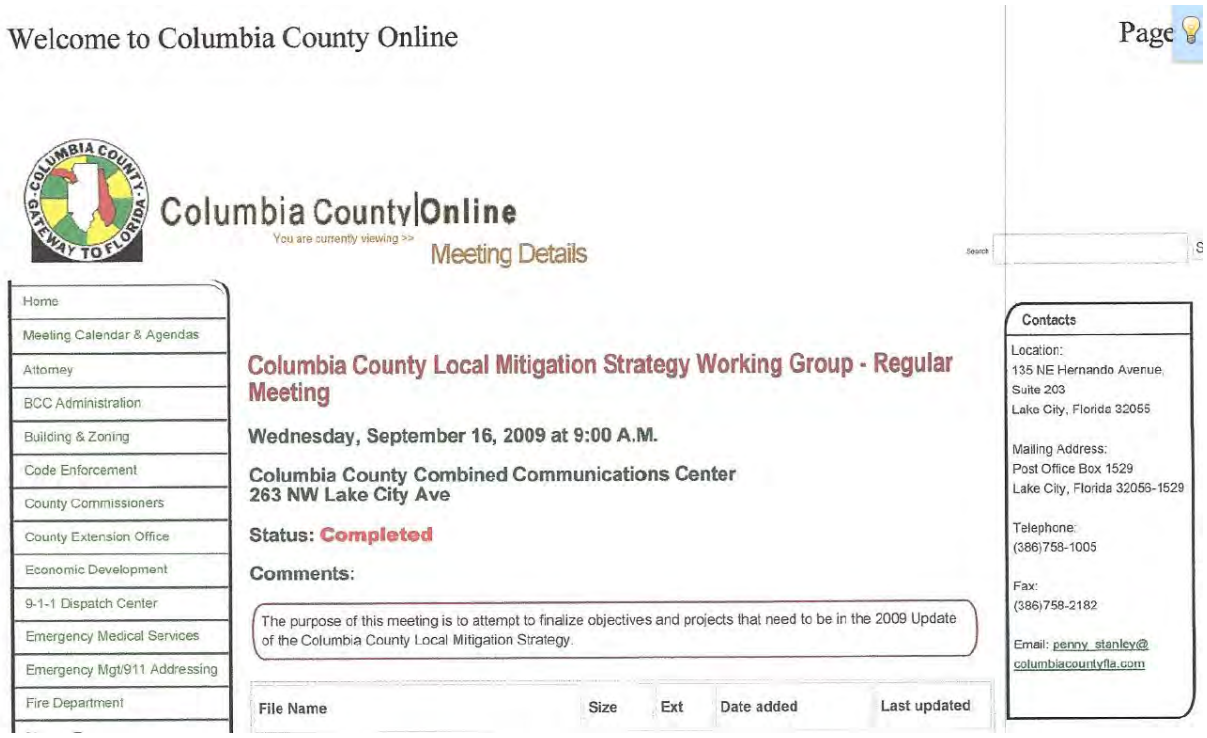
Telephone:
(386)758-1005

Fax:
(386)758-2182

Email: penny_stanley@columbiacountyfla.com

Meeting Date: September 16, 2009

G1 – Advertisement



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- Emergency Mgt/911 Addressing
- Fire Department

Columbia County Local Mitigation Strategy Working Group - Regular Meeting

Wednesday, September 16, 2009 at 9:00 A.M.

Columbia County Combined Communications Center
263 NW Lake City Ave

Status: Completed

Comments:

The purpose of this meeting is to attempt to finalize objectives and projects that need to be in the 2009 Update of the Columbia County Local Mitigation Strategy.

File Name	Size	Ext	Date added	Last updated

Contacts

Location:
135 NE Hernando Avenue,
Suite 203
Lake City, Florida 32055

Mailing Address:
Post Office Box 1529
Lake City, Florida 32056-1529

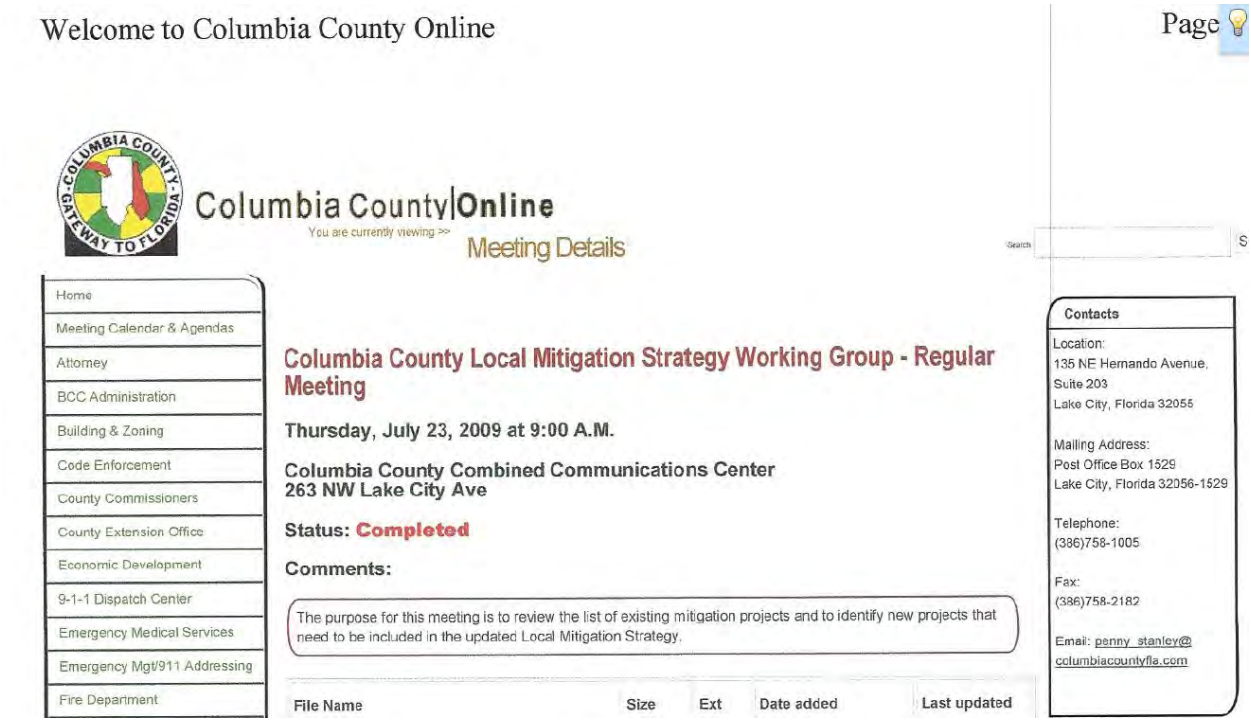
Telephone:
(386)758-1005

Fax:
(386)758-2182

Email: penny_stanley@columbiacountyfla.com

Meeting Date: July 23, 2009

H1 – Advertisement



Appendix II – Columbia County Community Wildfire Protection Plan

Columbia County
Community Wildfire Protection Plan

A Forward-Looking Process That Facilitates Fire Adapted Communities

June 2015

BENTON GRADE FIRE 2000

135 NE HERNANDO AVENUE
SUITE 203
LAKE CITY, FL 32056-1529

FLORIDA FOREST SERVICE
SUWANNEE FORESTRY CENTER
137 SE FORESTRY CIRCLE
LAKE CITY, FL 32025

Executive Summary

Community Wildfire Protection Plans (CWPPs) are authorized by the Healthy Forests Restoration Act of 2003. Having a CWPP gives the county priority status when applying for federal funding for wildfire hazard mitigation projects.

The CWPP helps the larger community in identifying risk and ways to mitigate wildfire risk.

The CWPP can consolidate knowledge and serve as a single resource for wildland fire risk and hazard mitigation information. Included are an assessment of Columbia 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 CWPP addresses the challenges of wildfire protection in the Wildland Urban Interface (WUI) through locally supported proactive solutions and activities, which facilitate the creation of Fire Adapted Communities (FAC). FAC articulates the collaborative community-wide effort message. The fire service, local decision makers, the public, and land managers each have an important role to play. Columbia County's recommended FAC activities should address the following strategies:

Integrate wildfire hazard mitigation planning into the comprehensive planning process

Adopt and implement planning and zoning measures to reduce risk to communities from wildfire

Align public investments in fuels treatments to demonstrable risk reduction activities by communities and landowners

Utilize fuels management programs to address protection of communities and their values.

Encourage communities, homeowners and landowners to actively manage land for fuels reduction

Examine and develop solutions to better utilize grant programs that address community, homeowner and volunteer capacity for fire mitigation efforts and activities for risk reduction

Reduce human caused ignitions

Engage non-traditional partners, such as the insurance industry and non-governmental organizations, in efforts to promote Fire Adapted Communities

Details for implementing the actions, such as responsible agencies and funding considerations are included in the Plan.

The CWPP is an adjunct to the Local Mitigation Strategy (LMS) and furthers the goals, mitigation strategies

and recommendations of the LMS Working Group. For that reason, the CWPP and its list of mitigation projects, once approved by the LMS Committee, shall be deemed an appendix to the LMS.

Plan Approval

This Community Wildfire Protection Plan (CWPP) is a cooperative effort to improve wildfire protection and response. The individuals listed below comprise the core decision-making team responsible for the development of this plan. The parties mutually agree on the plan contents.

County Government Representative

Signature: _____

Date: _____

County Fire Services Representative

Signature: _____

Date: _____

Local Florida Forest Service Representative

Doc Bloodworth
Wildfire Mitigation Specialist, Suwannee Forestry Center
137 SE Forestry Circle
Lake City, Florida 32025
386 243-6228

Signature: _____

Date: _____

US Forest Service Representative

Susan Kett
Prescribed Fire Specialist, National Forests in Florida
US Forest Service
475 S.E. CR 245
Lake City, FL 32025
386-758-9078

Signature: _____

Date:_____

Community Background and Existing Situation

Description of Community

Columbia County is located in the north central portion of the State of Florida and is bordered on the north by the State of Georgia, on the east by Baker and Union Counties, on the south by Alachua and Gilchrist Counties and on the west by Hamilton and Suwannee Counties. The Santa Fe River forms the boundary in the south and the Suwannee River forms a boundary on the northwest border of the County. Approximately 80,640 acres are located within the Osceola National Forest, on the eastern side of the County. The County has two incorporated municipalities within its border, The City of Lake City and The Town of Fort White. The interchange for Interstate Highways 10 and 75 is located in the northwest portion of the County. Since the 2010 LMS approval, no new municipalities have been either created or disbanded. The planning area continues to include the City of Lake City, Town of Fort White, and the unincorporated areas.

Community Statistics

According to 2010 population estimates by the Office of Economic and Demographic Research, 67,531 persons live in 24,206 households in Columbia County. This reflects 85 persons per square mile. Columbia County is described as Florida's 40th most populous county with 0.4% of the state's total population. Population projections through 2020 indicate an additional 17.1% increase to 77,000 persons. The majority of this growth will occur in more rural areas of the county. These locations have the highest wildfire risk in the county due agricultural land usage.

Total Land Area

Columbia County encompasses 797 square miles. Approximately 126 square miles or 80,640 acres are located within the Osceola National Forest on the eastern side of the County. The County's forestland totals 380,408 acres; 258,904 private and 121,504 public.

Wildfire Problem Statement

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 concern revolves around the increase of residential development in the Wildland Urban Interface (WUI), where natural vegetation meets homes and communities. About 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 these new residents are unaware of the natural role of wildland fire in Florida and therefore are unprepared.

Wildland-Urban Interface (WUI) fires are fast moving fires that often require many pieces of wildland firefighting equipment, and suppression is a difficult, time-consuming and costly operation. Wildland fire suppression must also take on the challenge of home and structure protection during almost every fire that is detected. Every year in Florida, an average of 3,200 wildfires burn nearly 130,000 acres; with residential and commercial structures either damaged or threatened 80% of the time. The cost of these operations grows proportionally with their complexity.

During the latest ten-year period, Columbia County has experienced 566 wildland fires, burning 6311 acres. The Impassable Bay Fires of 2004 and 2011 and The Bugaboo Fire of 2007 had a heavy impact on Columbia County but, as in Baker County, most of the acreage was in National Forest and is not reflected in FFS total acreage reporting. See Wildfire History below.

Another note to illustrate the affects of wildfires on nearby federal lands: Since the year 2000, the Okefenokee National Wildlife Refuge and the Osceola National Forest have recorded 15 major wildfires consuming more than 1.3 million acres. The affected counties include Clinch, Charlton, Ware, Columbia and Baker - report 1836 wildfires burning 294,089 acres for the past decade.

Risk analysis for wildfires takes into account fuel types and density, fire history and dwellings within the area. These factors as well as others are combined in the Southern Wildfire Risk Assessment Portal (SouthWRAP), administered by the Florida Forest Service. SouthWRAP displays maps depicting the greatest areas of concern in Columbia County. Appendix B (of the CWPP) contains maps and the Southern Wildfire Risk Assessment Portal Summary Report for Columbia County.

Additional information is needed at the community level, such as maps of current and anticipated fire prone areas, information on access routes, a warning system to alert residents of fire-related evacuations, and real-time data on the location and availability of water and other firefighting resources. Certain of that needed information follows in the body of this plan.

Planning Process

This plan was produced through a project facilitated by the Florida Forest Service (FFS) with funding from the American Recovery and Reinvestment Act of 2009.

The CWPP planning process is a collaborative effort among local, regional, state, and federal government agencies that have a role in protecting the community and residents from wildfire.
A kickoff meeting for all agencies participating in the project was held coincident to an LMS meeting on January 22, 2014. Additional meetings were held on March 27, 2014, March 10, 2015, and April1, 2015. Lists of those attending and summaries of meetings to develop this plan are included in Appendix A (of the CWPP).

The following individuals participated in the planning process and provided input in the preparation of this CWPP.

CWPP Working Group Members

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Information Resources

Reference the National Association of Counties' Guide to Wildfire Risk and Mitigation: "Planning fire-adaptive communities and mitigating the impact of wildfire is crucial to protecting residents and reducing emergency management costs. County officials play an essential role in leading community initiatives to prevent and mitigate the risks associated with fire in the Wildland Urban Interface."

The following were sources of guidance for the development of this plan: the 2010 Baker County Local Mitigation Strategy; the National Association of Counties Guide to Wildfire Risk and Mitigation; the American Planning Association Report: Planning for Wildfires; A Community Guide to Preparing and Implementing A Community Wildfire Protection Plan; U.S. Fire Administration: Your Role in Fire-Adapted Communities; The Fire Adapted Communities (FAC) Coalition Guide to Fire Adapted Communities; Florida's Forest Fire Laws and Open Burning Regulations; The Florida Fire Prevention Code, Chapter 17 Wildland Urban Interface; Florida Wildfire Aviation Plan; the Southeastern Interstate Forest Fire Protection Compact; the Florida Forest Service Fire Manual and the publication, Wildfire Risk Reduction in Florida-Home, Neighborhood, and Community Best Practices; The U of F IFAS publication, Wildfire Risk Assessment Guide for Homeowners in the Southern US; The National Fire Protection Association (NFPA) Guide to Community Wildfire Safety Through Regulation and NFPA Standards 1141,1142,1143,1144; The Firewise Communities/ USA Guide to Landscape and Construction; Blueprint for Safety by the Federal Alliance for Home Safety(FLASH); Fortified for Safe Living and the Wildfire Home Assessment Checklist by the Institute for Business and Home Safety; The Fire Smart Home Handbook and The Southern Wildfire Risk Assessment Portal Summary Report for Columbia County, FL.

Vulnerability Assessment

Wildfire Vulnerability Overview

Wildfires occur in Florida throughout the entire year. Typically, North Florida, including Columbia County, sees the greatest number of wildfires occurring during the months of April, May and June. Three major fires - The Benton/Benton Grade Fires of 2000, The Impassable Bay Fire of 2004 and The Bugaboo Fire of 2007 burned a total of 69,999 acres, a heavy impact on Columbia County.

During the 10-year period from January 1, 2005 through December 31, 2014, Columbia County saw a total of 566 wildfires that burned 6311 acres. See Wildfire History below.

Estimated Wildland Urban Interface (WUI) Community Protection Zones-CPZ

The Wildland Urban Interface (WUI) is defined in the National Fire Plan as the area where houses and wildland vegetation coincide. Inclusive would be WUI buffers of 1.5 miles around actual places where people live as well as significant infrastructure, gas pipeline locations and major evacuation routes.

The WUI is not a place, per se, but a set of conditions that can exist and make a community and its infrastructure vulnerable to a wildfire disaster. It can be a county, major subdivision or it can be four homes on an open range. These conditions can include (but are not limited to): the amount, type, and distribution of vegetation; the flammability of the structures (homes, businesses, outbuildings, decks, fences) in the area, and their proximity to fire-prone vegetation and to other combustible structures; weather patterns and general climate conditions; topography; hydrology; average lot size; and road construction.

Every year in Florida, an average of 3,200 wildfires burn nearly 130,000 acres; with residential and commercial structures either damaged or threatened 80% of the time. This makes WUI CPZ focal areas for human-environment conflicts such as wildland fires. For Columbia County, it is estimated 99% percent of the total population of 67,531 live within the WUI.

The Assessment Portal can be used to illustrate, determine and display the susceptibility of communities to wildfires or the amount of WUI acreage in the areas of interest. In the application of SouthWRAP, planners are able to express the exposure risks not only of property owners, but of wildland firefighters as well. In the WUI, those interests should not compete. If they might, the creation of winnable situations is a must.

The Southern Wildfire Risk Assessment Summary Report for Columbia County

The Summary Report contains information products and other support tools which homeowners, land owners, elected officials, local fire agencies and state/federal fire management agencies utilize in their determinations concerning key priorities for planning and wildland fire management issues such as firefighter safety, wildfire response and reduction of firefighting costs. Further explanation of SouthWrap and a copy of the entire Summary Report for Columbia County can be seen in Appendix B (of the CWPP).

Community Protection Zones/CPZs (previously Communities-At-Risk)

The Healthy Forests Restoration Act of 2003 defined at-risk communities as interface communities within the vicinity of Federal lands and other woodlands that are at risk from wildfire. The intent of identifying these at-risk communities was that they would prepare CWPPs and would ultimately then receives priority for pre-fire mitigation planning activities.

For purposes of this CWPP, the areas of interest are called Community Protection Zones, or (CPZs). CPZs are based on an analysis of the Where People Live housing density data and surrounding fire behavior potential. The Florida Forest Service maintains a list of these at-risk communities based on vulnerability information. They are:

Columbia City, Deep Creek, Drew Grade, Ellisville, Five Points, Five Points, Ft. White, Hollingsworth Bluff, Lake City, Lulu, Mason City, McColskey, Mershon, Mikesville, Mt. Carrie/Osceola Communities, Suwannee Valley, Three Rivers Estates, Wilson Springs, Winfield and Watertown. Other Communities/areas of Interest can be considered based on historical data and local experience.

Having been selected and shape files ascribed, the above communities/areas can be spotlighted as WUI CPZs. WUI CPZs represent those areas considered highest priority for mitigation planning activities. Inclusive would be CPZ WUI buffers of 1.5 miles around actual places where people live as well as significant infrastructure, utility corridors and major evacuation routes. Secondary CPZ boundaries inherently incorporate fire behavior conditions as well.

Using the SouthWRAP Professional Viewer, WUI CPZs shape files can be mapped and Summary Reports generated which provide an array of maps such as Wildland Urban Interface, WUI Risk Index, the Community Protection Zones, Burn Probability, Wildfire Behavior Outputs, Surface Fuels and Dozer Operability Rating. Maps of the named CPZs would be contained in Appendix B (of the CWPP).

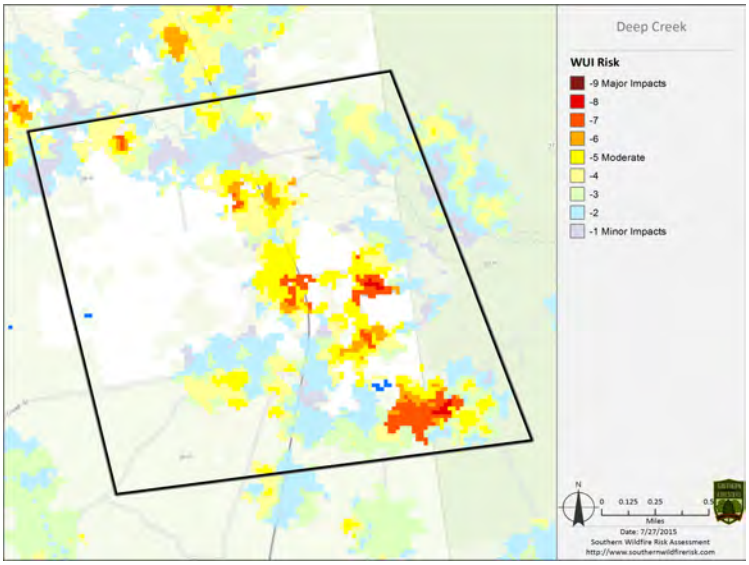
There are three types of WUI Community Protection Zones:
1) Boundary – areas where development is adjacent to public or private wildlands
2) Intermix – structures are scattered and interspersed among wildland areas
3) Island or occluded – area of wildland surrounded by development, i.e. a subdivision preserve

- Understanding WUI CPZs and the potential impact and consequences of wildland fire on people and there structures is the foundation for quantifying risks and prioritizing wildfire hazard mitigation planning activities.

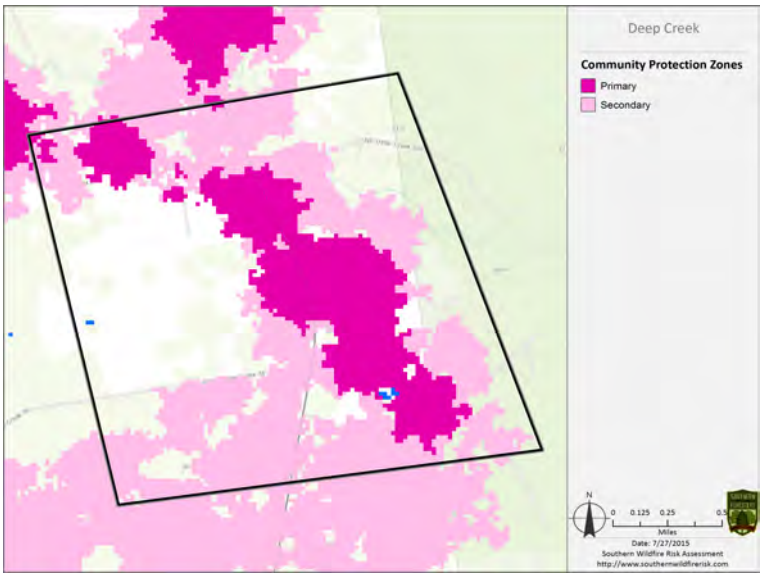
The Southern Wildfire Risk Assessment Portal (SouthWRAP)

Examples of the Deep Creek WUI CPZ maps are below:

The WUI Risk Index - The WUI Risk Index layer is a rating of the potential impact of a wildfire on people and their homes.



Community Protection Zones - CPZs are based on an analysis of the Where People Live housing density data and surrounding fire behavior potential.



A Wildfire Mitigation Specialist is assigned to each of the Florida Forest Service (FFS) field units.

As part of the total Florida Wildfire Hazard Mitigation Program, the mitigation specialist assists in all community planning and provides guidance for the application of Firewise principles in pre-fire action plans.

Critical Facilities/Infrastructure Vulnerabilities

The Columbia County Office of Emergency management develops and maintains a protected asset inventory, which reflects which facilities are within CPZ. This determination can be made according to the latest WUI Risk Index map included in this plan.

Wildfire History

The totals presented below are based on Florida Forest Service records and it is these figures, which form the basis for vulnerability analysis in the Southern Wildfire Risk Assessment Portal. However, these numbers are limited by the very nature of the FFS Fire Management Information System (FMIS) which only records fire on state and private lands.

Columbia County Wildfires/Acres Burned:

2005 - 52/610
2006 - 82/252
2007 - 46/735
2008 - 54/525
2009 - 39/110
2010 - 69/263
2011 - 95/333
2012 - 52/3339
2013 - 45/78
2014 - 32/64

Fires by Type of Acres Burned

01/01/2005 through 12/31/2014

County	Acres				Fires	Total Acres
	Limited Action	Commercial Forest	Non-Commercial Forest	Non-Forest		
Columbia	521.4	4,687.9	570.2	1,052.2	566	6,310.3

Fires by Causes

Suwannee Forestry Center
01/01/2005 through 12/31/2014
Columbia County

Cause	Fires	Percent	Acres	Percent
Campfire	10	1.77	16.0	0.25
Children	22	3.89	23.9	0.38
Debris Burn	0	0	0.0	0
Debris Burn--Auth--Broadcast/Acreage	13	2.30	80.3	1.27
Debris Burn--Auth—Piles	18	3.18	129.7	2.05
Debris Burn--Auth--Yard Trash	97	17.14	173.7	2.75
Debris Burn--Nonauth--Broadcast/Acreage	26	4.59	151.8	2.41
Debris Burn--Nonauth--Piles	46	8.13	141.7	2.25
Debris Burn--Nonauth--Yard Trash	72	12.72	226.0	3.58

Equipment use*	0	0	0.0	0
Equipment--Agriculture	17	3.00	349.3	5.53
Equipment--Logging	5	0.88	1.6	0.03
Equipment--Recreation	2	0.35	1.5	0.02
Equipment--Transportation	12	2.12	65.2	1.03
Incendiary	11	1.94	20.1	0.32
Lightning	62	10.95	3,969.3	62.89
Miscellaneous --Breakout	7	1.24	141.2	2.24
Miscellaneous --Electric Fence	1	0.18	85.0	1.35
Miscellaneous --Fireworks	7	1.24	17.9	0.28
Miscellaneous --Power Lines	31	5.48	60.8	0.96
Miscellaneous --Structure	4	0.71	0.8	0.01
Miscellaneous--Other	16	2.83	41.5	0.66
Railroad	4	0.71	376.4	5.96
Smoking	4	0.71	2.1	0.03
Unknown	79	13.96	235.8	3.74
Total	566		6,311.6	

During the ten-year period shown, the primary cause of wildfires in Columbia County is “Escaped Debris Burning” at 48% (and of that 30% was escaped Yard Trash). For the period, lightning, the second highest cause of wildfires, accounted for 11% of the total wildfires. In Columbia County then, 89% of the wildfires were human-caused.

Fire on Federal Land

The totals presented above are based on Florida Forest Service records and it is these figures, which form the basis for vulnerability analysis in the Southern Wildfire Risk Assessment Portal. However, these numbers are limited by the very nature of the FFS tracking system which only records fire on state and private lands.

To demonstrate how much greater the totals would be if a fire occurred on federal lands, the US Forest Service gathered data from the Columbia County portion of the Osceola National Forest. During the same period, 01/01/2005 through 12/31/2014, there were 98 wildfires in the Columbia County portion of the

Osceola, which burned 87,119 acres.

US FS FIRES BY CAUSE 1/1/2005 - 12/31/2014		
CAUSE	# FIRES	# ACRES
Lightning	66	85788.4
Arson	13	733.7
Debris Burn	2	5.5
Miscellaneous	6	131.8
Equipment	6	22.6
Railroad	2	400.1
Campfire	3	37.1
Children	0	0
Smoking	0	0
Total	98	87119.2

Source: US Forest Service

Occasionally, wildfires originate on the Department of Interior's Okefenokee National Wildlife Refuge. The Refuge, located northeast of Columbia County, extends into southern Georgia. Large wildfire frequency and long term drought are occurring with much more regularity than in past decades. Research and current climate studies indicate that this trend is likely to continue into the next century. When wildfire does come across the refuge, they tend to be classified as "mega fires", and directly affect or threaten Columbia County. Such was the case with the Big Turn-Around Fire of 2007, which burned 560,000 acres, and 2011's Honey Prairie Fire, which burned 310,000 acres.

Local Capacity and Current Wildfire Protection Activities

Organizations and Resources

Local Emergency Management

Columbia County Department of Emergency Management
263 NW Lake City Avenue.
Lake City, FL 32055

Local Disaster Support Agencies

Agency	Address	Phone
Red Cross	971 W Duval Street	386-752-0650
United Way	325 NE Hernando Street	386-752-5604
Catholic Charities Bureau Inc.	259 NW Burk Ave.	385-754-9180

Local Fire Services (A map of Fire Stations/Fire Protection Areas is in Appendix B (of the CWPP).

Staffed Fire Stations/Fire Protection Areas

Fire Station	Address	Phone
Columbia County Fire Rescue Admin	509 SW Bascom Norris Drive	386-754-7057
St. 42 Suwannee Valley	7264 NW US Hwy 41	386-758-2133
St. 43 West Columbia	2318 SW Pinemount Road	386-758-2165
St. 45 Ellisville	12595 S US Hwy 441	386-758-2134
St. 46 Ft. White	495 SW Dortch Street	386-497-3333
St. 48 Racetrack	370 SE Racetrack Lane	386-754-7063
St. 49 CR 18	3303 SW CR 18, Ft. White	386-497-4510
St. 50 Mershon	1456 NW Mershon Street	386-758-4907
St. 51 Lake Jeffrey	1579 NW Lake Jeffrey Road	386-438-5128
St. 1 Lake City Fire Department	225 NW Main Blvd #101	386-752-3312

Volunteer Fire Stations/Fire Protection Areas

Fire Station	Address	Phone
St.41 Deep Creek	11936 N US Hwy 441	386-755-9395
St. 44 Columbia City	332 SW Wingate Street	386-758-1357
St. 47 Lulu	262 SE Community Drive	386-758-2166

The Columbia County Fire Department has:
Automatic Aid Agreements with High Springs Fire Department and Union County Fire Rescue
Mutual Aid Agreements with High Springs Fire Department, Union County Fire Rescue and White Springs Fire Department,

And the county is currently in negotiation to finalize agreements with Suwannee County Fire Rescue, Baker County Fire and Hamilton County Fire Rescue.

The 2014-2015 Operations Plan Between the Florida Forest Service and Columbia County Fire Department: The purpose of this plan is to outline the framework of both administration and operational functions for the Florida Forest Service (FFS) and Columbia County Fire Department as they relates to outdoor burning, wildland fires, and other emergencies which may require interaction between the two departments.

Florida Forest Service (FFS)

The Florida Forest Service, Suwannee Forestry Center has the primary responsibility for prevention, detection and suppression of wildfires wherever they may occur.

FFS Work Stations/Fire Protection Areas and Fixed Wing Aircraft Suwannee Forestry Center	Address	Phone
Lake City Forestry Station	137 SE Forestry Circle Lake City FL 32025 STR: 34/3S/17E	386-243-6243
O'Leno Tower	761 SE Spirit Loop High Springs, FL 32643 STR: 34/6S/17E	386-454-8250
Bullock Tower Located on US 41, 3 miles north of White Springs Fixed Wing Aircraft	STR: 35/1S/15E Assigned Pilot Lake City Airport Hanger # B1	386-243-6243 386-243-6231

The Florida Forest Service (FFS) uses 17 single-engine patrol aircraft to provide aerial fire detection and intelligence to firefighters. The FFS aircraft pilot assigned to the Suwannee Forestry Center is a Certified Wildland Firefighter. When engaged in wildfire suppression the pilot has positive radio contact with FFS ground resources, the local fire department, emergency responders and law enforcement. In some incidents the FFS aircraft pilot will assume aerial command and control of all ground resources. Medium and light duty helicopters are also close by for added observation, to transport firefighters and to apply counter fire, water and fire retardants.

The Southeastern Interstate Forest Fire Protection Compact: Member States are Alabama, Florida,

Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia. The purpose of this compact is to promote effective prevention and control of forest fires in the southeastern region of the United States by the development of integrated forest fire plans, by the maintenance of adequate forest firefighting services by the member states, by providing for mutual aid in fighting forest fires among the compacting states of the region and with states which are party to other regional forest fire protection compacts or agreements, and for more adequate forest protection.

US Forest Service
Osceola National Forest, District Ranger Station
US HWY 90
Olustee, FL 32072
386-752-2577
Air Tanker Base
475 S.E. CR 245
Lake City, FL 32025
386-758-9078

The Florida Forest Service and the USDA Forest Service work together under the Incident Command System in response to wildfires. An Air Tanker Base is located at the Lake City Airport. Air tankers are positioned at this base when conditions in the area warrant. Turn-around time for a single air tanker to anywhere in the county is approximately one retardant drop every 20 minutes.

The Georgia Forestry Commission, In Echols County
US HWY 129 North
Statenville, GA
229-559-5694

The Fire Adapted Community (FAC) – The next step in wildfire preparedness

A FAC is a human community consisting of informed and prepared citizens collaboratively planning and taking action to safely coexist with wildland fire. Residents possess the knowledge and skills to properly prepare their home when wildfire is threatening and to safely evacuate when necessary. Supported by local, state and federal agencies, the FAC uses tools to prepare its homes, neighborhoods, businesses, infrastructure, natural areas and surrounding landscape for wildfire. See www.fireadapted.org

At a minimum, Columbia County's FAC pre-fire actions should include the following plans and programs:

A Community Wildfire Protection Plan (CWPP). A collaborative plan created by the fire department, state and local forestry staff, land managers, community leaders, and the public. The planning process

maps values at risk, including neighborhoods, businesses, infrastructure, and natural areas. Proposed actions to mitigate community and homeowner vulnerabilities to wildfire hazards, includes prescribed burning, the application of Firewise principles or other measures that adapt a community to fire. See http://www.forestsandrangelands.gov/communities/cwpp.shtml

Firewise Communities/USA. This program engages homeowners regarding the personal proactive steps, which can be taken to mitigate their vulnerabilities to wildland fire. Once the neighborhood has met specific criteria, they can apply for national Firewise recognition. See www.firewise.org

Ready, Set, Go! The program engages both the public and emergency services agencies in preparing a community for wildfire. Local fire departments deliver the Fire Adapted Communities message using Firewise principles, wildfire situational awareness, and with assistance from law enforcement, safe evacuation planning and execution. See www.wildlandfirersg.org and Appendix B (of the CWPP)for map of Columbia County Evacuation Routes.

Notes: 1. ISOs, in their Community Rating System (CRS), are considering the existence of Fire Adapted Communities (FAC) as a mitigating factor. 2. The U.S. Fire Administration recommends everyone should have a comprehensive home fire protection plan that includes smoke alarms, fire sprinklers, and practicing a fire escape plan.

Community Development in the WUI

As population's increase and development continues to push into the Wildland Urban Interface (WUI), it will be necessary to take active steps to reduce the wildfire risk to Columbia County residents. In identified Community Protection Zones (CPZ), wildfire hazard mitigation through land development regulations, vegetative fuel reduction, and on-going public engagement programs serves to greatly reduce the potential for loss of human life and property from wildfire. Inclusive would be WUI buffers of 1.5 miles around the actual places where people live, significant infrastructure as well as, utility corridors and major evacuation routes.

Where the SouthWRAP Summary Report WUI Wildfire Risk Index rating indicates a potential impact of wildfire on people and their homes, the construction techniques for new developments and residential structures should be in conformance with:

The Florida Fire Prevention Code, Chapter 17 Wildland Urban Interface, and
The NFPA codes 1141, 1142, 1143 and 1144, which are adopted by reference in the Florida Fire Prevention Code.

These standards provide a methodology for assessing wildland fire ignition hazards around existing

structures, residential developments, subdivisions and improved property or planned property improvements that will be located in a wildland urban interface area. Minimum requirements for new construction and fuel modification to reduce the potential of structure ignition from wildland fires are provided, as well as requirements for the supply of water for suburban and rural firefighting.

Existing structures can be retrofitted to meet these Standards through the implementation of either Firewise principles and the adoption of appropriate language in the building codes. Permits for structure improvement or repair should require adherence to these principles and the above Standards.

Developers wishing to obtain a permit to build in a WUI CPZ should be required to create a Wildland Fire Hazard Mitigation Plan that addresses fuel modification within the structure ignition zone. Issues to be addressed: landscaping for defensible space, ignition-resistant construction, hazardous fuel reduction, water supply, access roads, fire protection and plan maintenance. See Appendix A (of the CWPP)for this and other policy recommendations.

Vacant properties and land preserves should be maintained in accordance with acceptable fire prevention practices. Disincentives to the maintenance of such properties should be replaced with an incentive system to facilitate the removal of dense, hazardous vegetation.

County owned property and critical infrastructure should have active, pre-fire mitigation action plans to help reduce the liability for damage caused by wildfires coming off county owned properties. Inclusive would be WUI buffers of 1.5 miles around actual places where people live, significant infrastructure as well as, utility corridors and major evacuation routes.

Detailed information for high priority wildfire mitigation actions/projects, including participating agencies and evaluation criteria, can be found in Appendix C (of the CWPP).

Local Mitigation Strategy (LMS) Working Group

The LMS is at the heart of community hazard planning and is considered to be the minimum level of strategic hazard planning in most communities. The Columbia County LMS Committee/Work Group was established to make the population, neighborhoods, businesses, institutions and critical facilities of the community more resilient to the impacts of future disasters. The Local Mitigation Strategy, the Columbia County Comprehensive Plan and LDRs should address issues connected to wildland fire activity, prevention, mitigation and suppression. To cite the 2010 LMS Mitigation Strategy:

MITIGATION STRATEGY

5.1.3. Wildfire

Goal 5 – Minimize the effects of wildfire in Columbia County
Objective 5.1

Support the Florida Division of Forestry (now Florida Forest Service) with fuel reduction activities in the Wildland Urban Interface.
Objective 5.2
Support Florida Division of Forestry (now Florida Forest Service) to educate homeowners about wildfires and the need for vegetation management programs such as prescribed fire.
Objective 5.3
Coordinate with the Florida Division of Forestry (now Florida Forest Service) to develop and retrofit strategies incorporating Firewise construction and landscaping techniques
Goal 6 – Minimize loss of public utilities
Objective 6.1
Continually work with utility companies to maintain utility service minimizing downtime.

When updating the Local Mitigation Strategy (LMS), Columbia County can consider the following wildfire mitigation categories when prioritizing projects for Pre-Disaster Hazard Mitigation Grant Program (HMGP) eligibility: Defensible Space for Wildfires, Application of Ignition-Resistant Construction and Hazardous Fuel Reduction.

For detailed guidance on FEMA Mitigation Policy MRR-2-0801 visit www.fema.gov

Other partner organizations:

Wildland Fire Response Capabilities

The Florida Forest Service has the primary responsibility for prevention, detection and suppression of wildfires wherever they may occur.

When wildfire comes to Columbia County, mutual aid and wildfire suppression is coordinated between the Florida Forest Service, Columbia County Fire, Georgia Forestry Commission and USDA Forest Service.

The Columbia County Fire Department has Automatic Aid Agreements with High Springs Fire Department and Union County Fire Rescue. Mutual Aid Agreements with High Springs Fire Department, Union County Fire Rescue and White Springs Fire Department, And is currently in negotiation to finalize agreements with Suwannee County Fire Rescue, Baker County Fire and Hamilton County Fire Rescue

Wildland Fuel Management Capabilities

Best Management Practices

The Florida Forest Service shall promote natural resource management and fuel reduction through the use of prescribed fire and other fuel reduction measures.

The resources of The Florida Forest Service (FFS) are available to the County. The FFS Regional Wildfire Hazard Mitigation Team actively seeks opportunities to support local residents and communities with their hazardous fuels reduction programs on nearby woodlands. Inclusive would be WUI buffers of 1.5 miles around actual places where people live, as well as significant infrastructure, utility corridors and major evacuation routes.

Open Burning

The Florida Forest Service (FFS), USDA FS, Okefenokee National Wildlife Refuge, individuals and land managers certified and authorized to do so by the FFS, have active Prescribed Fire and Hazardous Fuel Reduction programs within their respective forests and rangelands. Results are best illustrated by the following fire management information:

Burning Authorizations Summary
Suwannee Forestry Center
01/01/2005 through 12/31/2014
Columbia County

Burn Type	Authorized Fires	Authorized Acres	Authorized Piles
Agricultural--Pasture	3,890	29,933	4,339
Agricultural--Range management	42	1,258	29
Agricultural--Stubble (post harvest)	118	1,011	231
Agricultural--Sugarcane	4	3	1
Agriculture—Citrus	0	0	0
Land clearing--Non-residential--With ACI	475	0	492
Land clearing--Non-residential--Without ACI	5,789	920	11,206
Land clearing--Residential--With ACI	302	0	420
Land clearing--Residential--Without ACI	5,512	459	9,476
Silvicultural--Disease control	18	0	55
Silvicultural--Ecological	97	6,978	42
Silvicultural--Hazard removal	978	129,060	951
Silvicultural—Other	0	0	0
Silvicultural--Prior to seed	189	1,155	664

Silvicultural--Site preparation	468	4,275	1,263
Silvicultural—Wildlife	98	11,815	6
Total	17,980	186,867	29,175

Experience Implementing Wildfire Protection Programs

The Florida Forest Service has the primary responsibility for prevention, detection, and suppression of wildfires wherever they may occur. The Florida Forest Service shall provide leadership and direction in the evaluation, coordination, allocation of resources, and monitoring of wildland fire management and protection.

Also, there are the 2010 County LMS-Wildfire Objectives and Completed Projects:
- Work with the Florida Division of Forestry (now the Florida Forest Service) to inform the public of Firewise building and landscape design principles
- Maintain local laws, which allow local government to enact burn bans during periods of drought
- EOC Publication Natural Hazards Guide-FIRE and
- CWPP Assessments, Meetings and Reports

CWPP Goals and Objectives

Goal 1: By the LMS Working Group, their approval of this CWPP and affirming it an appendix to the Local Mitigation Strategy NLT November 2015.

Goal 2: Evaluate WUI Parameters and Criteria for Columbia County in SouthWRAP
Objective 2.1: Assess WUI CPZ of Columbia County
Objective 2.2: Identify/spotlight and map Primary CPZ and CPZ/Firewise project areas of most concern
Objective 2.3: Determine priorities for mitigation planning activities
Objective 2.4: Seek the incorporation and application of the Firewise principles of ignition-resistant construction, defensible space/landscape design and hazardous fuel reduction into county land use and development codes.

Goal 3: Enhance Columbia County Fire Department Wildland Firefighting Capabilities
Objective 3.1: Obtain training from all possible sources
Objective 3.2: Exercise wildland firefighting safety and response

Goal 4: Promote the Fire Adapted Communities Initiatives of the Florida Forest Service (A Fire Adapted Coalition which would identify wildfire risks in the county and develop and implement projects and programs that will protect the citizens is envisioned.)
Objective 4.1: Participate in the Florida Firewise Program and initiate projects according to Objective 2. 2.

Objective 4.2 Join and Participate in the IAFC Ready Set Go! Program
Objective 4.2a: Provide RSG training for county emergency, fire and law enforcement personnel
Objective 4.2b: Provide RSG workshops for homeowners, stressing Firewise principles, wildfire situational awareness, safe evacuation planning and execution.

Goal 5: Document and showcase Columbia County's CWPP, Firewise activities, Ready Set Go! Program and other wildfire hazard mitigation actions for ISO consideration.

Goal 6: Engage the media with updates on a broad range of public messages to facilitate public wildfire risk awareness, preparation and mitigation. This effort will include the use of social media.

Goal 7: Conduct monitoring and evaluation of plan progress at least annually to review goals and update plan as needed or as new information becomes available

Implementation and Plan Maintenance

As part of the Florida Wildfire Hazard Mitigation Program, the FFS provides local mitigation planning teams to assist state and local government agencies in the development of policy, planning and construction regulations and response improvements for inclusion in LCPs, LDRs, LMSs and CWPPs. These actions contribute to the integration of wildfire hazard preparedness and mitigation into the planning process at all levels.

The CWPP is to be implemented as resources become available to incrementally mitigate community wildfire vulnerability. An action plan has been collaboratively developed by the CWPP Working Group to guide implementation efforts over the next 5 years. An action as listed in this Plan is a strategy, project, or program that reduces wildfire vulnerability in the community. Each action will be assigned a lead agency or organization that will be responsible for implementation. The use of collaborative such as interagency and public-private partnerships to implement the CWPP is encouraged.

Potential Funding Sources

Columbia County is eligible to receive special federal funding for the purposes of furthering Firewise principles within the county. Reference Title III, Secure Rural Schools Act: this funding shall be utilized for developing the Columbia County CWPP, carrying out projects which incorporate eligible Firewise principles and, in liaison with the FFS, assisting communities in gaining Firewise Communities USA recognition. Similar FEMA HMGP funding is available to Columbia County for pre-fire mitigation activities. For detailed guidance on FEMA Mitigation Policy MRR-2-0801 visit www.fema.gov

The county fire department is encouraged to join the International Association of Fire Chiefs Ready, Set Go

Program and receive a $1000 grant for program expenses. Ready, Set, Go! www.wildlandfirersg.org/

Additional descriptions of major federal and state funding sources applicable to wildfire hazard mitigation and response improvements are available in the State of Florida Enhanced Hazard Mitigation Plan and the Wildfire Hazard Mitigation Plan Annex, 2013.

The National Association of Counties(NACO) has a members-only Grants Clearinghouse with a listing of federal, state, corporate and foundation grants available to counties and community-based organizations.

The CWPP Working Group should meet annually to discuss budget requests among the partner agencies and determine potential grant opportunities that can be applied for during the year.

Plan Maintenance and Evaluation

The CWPP should be evaluated and updated on an annual basis to ensure information is current, monitor progress of the Plan, and alter Plan content as necessary. Every 5 years the plan should receive a major update in which the vulnerability assessment is updated and the action plan is evaluated for its effectiveness over the past 5 years and its suitability for the next 5 years. A resource for evaluating the plan is the *Community Wildfire Protection Plan Evaluation Guide* prepared by the University of Oregon Resource Innovations Institute for a Sustainable Environment in 2008. The FFS has adapted evaluation questions from this resource to guide Florida communities in assessing the CWPP during a major plan update. The organizational representation from the Working Group should be reconvened, at a minimum, to conduct the major update. The 5-year update should ideally occur prior to or simultaneously with the 5-year update to the Local Mitigation Strategy. Only the 5-year update requires new plan approval signatures.

1. Action Plan for the Fire Adapted Community

This section describes implementation strategies or actions that will advance the goals and objectives of this CWPP. These pre-fire actions are organized by mitigation category: 1) wildland fuel management, 2) community outreach and education, 3) Firewise building retrofit and landscaping, 4) policy and regulation recommendations, and 5) wildland fire response improvements. The following action recommendations are listed in priority order within each mitigation category based upon ability to most significantly decrease wildfire vulnerability in the community.

As part of the Florida Wildfire Hazard Mitigation Program, the FFS assists in all community planning and provides guidance for the application of FAC concepts and Firewise principles in pre-fire action plans.

Detailed information for high priority actions and projects, including participating agencies and evaluation criteria, can be found in Appendix C (of the CWPP).

Wildland Fuel Management

Hazardous Fuel Reduction projects help reduce the size and intensity of wildland fires and also decrease the likelihood that a wildfire will start in an area. These actions can increase the safety of people and property while reducing response and suppression costs.
Fuel management treatments designed to reduce wildfire risk are temporary and in most cases reduce the hazard in the treated area for three to five years. Periodic management is required on a regular basis to maintain fuels at an acceptable level to reduce wildfire risk. Inclusive would be WUI buffers of 1.5 miles around actual places where people live, as well as significant infrastructure, utility corridors and major evacuation routes.

The US Forest Service, Okefenokee National Wildlife Refuge, and Florida Forest Service will work jointly to maintain fuel treatment schedules, and specifically target prescribed fire treatments to protect communities within Columbia County. This expanded core partners group is also focused on longleaf pine restoration, and fuel treatments to encourage Landscape scale fire resiliency.

Additionally, Florida Forest Service will work with commercial land management agencies and private landowners to maintain individual fuel management goals. Public demonstrations can be conducted to show the various fuel management methods, which can be used to achieve site-specific benefits. These Hazardous Fuel Reduction methods can include:

- Prescribed burning;
- Mechanical treatment (e.g., mowing, mulching, disking, fire line plowing, and chopping);
- Chemical treatment (herbicide application);
- Biomass removal (e.g., pine straw harvesting, vegetation or tree thinning, and timber harvesting); and
- Biomass conversion (grazing).

As projected in the LMS, the county should embark on a vigorous education program to help residents know and understand Firewise principles, the value of vegetation management, and need for prescribed burning in fire prone areas. A Fire Adapted Coalition would identify wildfire risks in the county and develop and implement projects and programs that will protect the citizens. Detailed information for high priority wildland fire hazard mitigation actions/projects, including participating agencies and evaluation criteria, can be found in Appendix C (of the CWPP).

Wildland Fuel Management Actions

	Lead Agency	Timeframe	Potential Funding
Objectives:			
1-Support the Florida Forest			

Service with fuel reduction activities in the WUI.
2-Support the Florida Forest Service to educate homeowners about wildfires and the need for vegetation management programs such as prescribed fire.

Community Outreach and Engagement

The Fire Adapted Community (FAC): the next step in wildfire preparedness

Wildfire preparedness programs are designed to raise awareness and improve both homeowner and community-level knowledge of risk reduction needs and practices.
Suggested elements of discussion should include:

Community Protection - How wildfire spreads and why we must adapt to living with wildfire
Access - How residents and communities can avoid falling victim
Defensible Space - Easy steps anyone can take to reduce the chances of wildfire damage
The Built Environment - Facts every resident should know about saving their property from wildfire
Evacuation - Preparing residents to evacuate their home in the event of wildfire

Not only does outreach enable us to engage with the residents we serve, but it can provide great relationship-building opportunities with other agencies, local officials, local businesses, and neighborhood associations. In the best cases, outreach programs will influence attitudes and opinions and result in effective action. Good examples of public engagement initiatives are FAC, Florida Firewise Communities, the IAFC program Ready, Set, Go and the SouthWRAP Public Viewer.

In our application of SouthWRAP, which provides several fire behavior landscape characteristics, and WUI related indices, we are able to express the exposure risks not only of our property owners, but of our wildland firefighters as well. In the WUI, those interests should not compete. If they might, the creation of winnable situations is a must.

Florida has been actively engaged in the Firewise Communities/USA program since 1999.
Wildfire mitigation specialists are assigned to each of the Florida Forest Service (FFS) field units.
They serve as the point persons for assistance with all Fire Adapted Communities initiatives, CWPPs, Florida Firewise Communities, the International Association of Fire Chiefs (IAFC) Ready Set Go Program and the SouthWRAP.

As part of the total Florida Wildfire Hazard Mitigation Program, the FFS field unit assists in all community planning and provides guidance for the application of firewise principles in pre-fire action plans.

Vacation homes pose another area of risk. These "seasonal" residents may not be familiar with the local WUI threat and may bring with them inaccurate notions of fire and operational response capabilities. It is important for fire departments to reach out to these populations to inform them of the local situation and build understanding to perform a home assessment on their property. The brochure, RSG for Seasonal Residents and Property Owners can be seen in Appendix B (of the CWPP).

Prior to fire danger hitting critical levels the Florida Forest Service may request the assistance of a Fire Prevention Team. A Fire Prevention Team is a group of people specifically tasked to reduce human-caused wildfires. Efforts made by a team should not be looked at as a quick fix, but should be set up in conjunction with an ongoing Fire Prevention and Wildfire Risk Awareness program.

Community Outreach and Engagement Actions

	Lead Agency	Timeframe	Potential Funding
Objective: 1-Support the Florida Forest Service with fuel reduction activities in the WUI. 2-Support the Florida Forest Service to educate homeowners about wildfires and the need for vegetation management programs such as prescribed fire.			
2010 LMS Completed project: Countywide Firewise Design Principles. Work with the Florida Division of Forestry (Florida Forest Service) to inform the public of Firewise building and landscape design principles.	BCC/FDOF		
LMS meetings open to public Social Media The Natural Hazards Guide-FIRE			

Firewise Communities, Building Retrofit and Landscaping

Currently there are no Firewise Communities in Columbia County. As suggested in 5. Goals and Objectives

2.2 and 4.1, the Pre-fire CPZ/Firewise projects can include public-private partnerships which teach community and home risk assessment and Firewise principles such as hazardous fuel reduction, defensible space and landscaping within the home-ignition zone and the application of ignition-resistant construction. Communities and neighborhoods that should receive emphasis are those impacted by fire behavior in the past and identified as at-risk in the SouthWrap CAR Editor. Maps spotlighting these project areas can be added to Appendix B (of the CWPP). Projects can be listed and documented in Appendix C (of the CWPP).

A Wildfire Mitigation Specialist is assigned to each of the Florida Forest Service (FFS) field units. As part of the total Florida Wildfire Hazard Mitigation Program, the mitigation specialist assists in all community planning and provides guidance for the application of Firewise principles in pre-fire action projects and plans.

Presentations should be provided to appropriate county officials on FAC, Firewise principles and Ready, Set, Go!

Firewise Communities, Building Retrofit and Landscaping Actions

	Lead Agency	Timeframe	Potential Funding
One LMS goal relating to wildfire is to minimize damage to existing and future buildings and critical infrastructure as a result of wildfires. LMS Objectives; 1-Support the Florida Forest Service with fuel reduction activities in the WUI. 2-Coordinate with the Florida Forest Service to develop and retrofit strategies incorporating Firewise construction and landscaping techniques.			

Policy and Regulation Recommendations

A community's investment in fire mitigation is a proven and reliable predictor of future fire losses. A community that invests in promoting effective building code enforcement and fire prevention efforts should experience lower losses. In addition to potential insurance benefits, these initiatives can also provide useful benchmarking information that helps fire departments, building code enforcement departments, and other public officials measure the effectiveness of their efforts and plans for improvements.

Updating local government plans, policies, and regulations is another effective way to advance wildfire hazard mitigation goals. By modifying requirements for development in WUI CPZs, new development can be proactively designed to reduce wildfire risk and therefore make living and working in these areas safer.

The County should seek the incorporation and application of Firewise principles, ignition-resistant construction, and defensible space/landscape design and hazardous fuel reduction into county land use and development codes. Language for incorporation into Comprehensive Plan could include:

Policy…To Improve the Local Mitigation Strategy for Wildfire Hazard

The County shall incorporate wildfire prevention, education, and mitigation strategies into the County Local Mitigation Strategy.

Policy… Require Wildfire Hazard Mitigation Plan

Any new subdivision or non-residential development in WUI CPZs shall complete a "Wildfire Hazard Mitigation Plan" specific to that development, and subject to review and approval by the County Fire Marshall as part of plan approval process. The wildfire mitigation plan shall address at a minimum:
-Access
-Vegetation
-Building construction
-Utilities
-Fire protection (to include water supplies)
-Home Owner's Association organization and ongoing education
-Additional factors: including vacant areas within the development that present a barrier to wildfire access such as canals or ditches
All of these factors can be evaluated based on NFPA 1144 Standard for Reducing Structure Ignition Hazards from Wildland Fire, 2013 Edition, NFPA 1141 Standard for Fire Protection Infrastructure for Land Development in Suburban and Rural Areas, 2012 Edition and NFPA 1142 Standard on Water Supplies for Suburban and Rural Firefighting 2012 Edition.

Policy…To Adopt Mitigation Standards Based on the Southern Wildfire Fire Risk Assessment Portal

The County shall adopt LDRs to set forth standards for development within high-risk wildfire areas as identified by the Southern Wildfire Risk Assessment Portal Summary Report for Columbia County.

A Wildfire Mitigation Specialist is assigned to each of the Florida Forest Service (FFS) field units.
As part of the total Florida Wildfire Hazard Mitigation Program, the mitigation specialist assists in all community planning and provides guidance for the application of firewise principles in pre-fire action policies and plans.

Policy and Regulation Actions

	Lead Agency	Timeframe	Potential Funding
2010 LMS Completed Project: Maintain local laws, which allow local government to enact burn bans during periods of drought. See Appendix C (of the CWPP).	BCC		
2014-2015 County Operating Plan Between: Columbia County and the Florida Forest Service			

A Possible Example of Success: from Headwaters Economics Case Study, May 2015

"Success on the ground may look something like this: A fire breaks out and is allowed to burn because of the ecological benefits. Because of a variety of risk reduction and mitigation efforts, including land use planning mechanisms, the fire burns around the community and no houses are destroyed.

Incentives for community features that reduce wildfire risk, such as fuel breaks, cluster development, landscape treatments, development and design standards, subdivision regulations and other planning tools are successfully applied where appropriate. No expensive air tanker planes are needed, and no one is injured or killed.

As a result of good planning, wildland fire has played its role in reducing fuels, and agency funds are now used for landscape restoration projects rather than defense of homes. Developers have been rewarded, through density bonuses, expedited processing time and other incentives, for producing subdivisions that are fire-adapted. As a result of safer residential developments, home values have increased and insurance rates have declined."

Wildland Fire Response Improvements

Current Statistics: Every year in Florida, an average of 3,200 wildfires burn nearly 130,000 acres; with residential and commercial structures involved 80% of the time. These WUI facts are important to know as the fire service is often not able to respond to every home affected by wildland fire.

A Fire Adapted Communities (FAC) located in the WUI requires little assistance from firefighters during a wildland fire. Residents accept the responsibility for living in a high fire-hazard area. They possess the knowledge and the skill to 1. Prepare homes and property to survive wildland fires and 2. Evacuate early, safely and efficiently.

The need: to avoid compromising the ability of WUI firefighters to fight fire effectively and safely.

Opportunities to improve WUI fire response capabilities are critical to reducing the risk of wildfire damage to people, property and community assets. Improvements in response capabilities can include addressing advanced WUI training needs, home and neighborhood risk assessments, increasing staff and volunteer fire fighting resources and appropriate procedures or protocols.

Columbia County Fire Department has been proactive in its effort to gain Wildland Firefighting Training for staff. This activity should be pursued to give all firefighters complete wildfire training and tactical knowledge. The initial attack capabilities of local firefighters to conduct suppression operations until the Florida Forest Service Wildland Firefighters arrive will greatly diminish potential loss.

In reevaluating firefighting capabilities of the County, up-to-date information provided by the appropriate Insurance Service Organization (ISO) about needed changes is used to examine the adoption of fire prevention codes, fire prevention and fire investigation programs, fire-district boundaries, automatic-aid agreements, fire station locations, fuel loads, road networks and access to water supplies. In aligning the capabilities of the County with the applicable elements of the ISO Fire Suppression Rating Schedule, the County is able to maintain the desired Public Protection Classification.

Wildland Fire Response Improvement Actions

	Lead Agency	Timeframe	Potential Funding
Automatic Aid Agreements			
Mutual Aid Agreements			
Reverse 911			
Three new fire stations			
2014-2015 County Operating Plan Between: Columbia County and the Florida Forest Service			

CWPP: Appendix A: Planning Process Meetings

A Forward-Looking Process That Facilitates Fire Adapted Communities

On January 22, 2014: Attendee list attached.
A kickoff meeting for all agencies participating in the CWPP project was held coincident to an LMS meeting of the entire LMS Working group. It was decided to proceed with the development of a countywide CWPP.

On March 27, 2014: Attendee list attached.
The LMS Chairman, Shayne Morgan, convened a core Work Group. A draft CWPP was presented by the FFS representatives for review. A 10-14 month timeline was established for CWPP completion.

In February, 2015:
An informal discussion between the EOC, County Fire and the FFS resulted in the revitalization of the CWPP effort. The FFS representative prepared a re-draft of a CWPP for review by a work group.

On September 8, 2014: Completion of the 2014-2015 County Operating Plan between Columbia County Fire Department and the Florida Forest Service: copy attached.

On March 10, 2015: Attendee list attached.
A work group of stakeholders convened to review the re-draft and proceed with the finalization of the CWPP. It was agreed also that the completed CWPP be approved by the LMS Working Group for inclusion as an appendix to the LMS. Various tasks remain in the assimilation of data and information necessary to complete the plan. The latest draft to be e-mailed to all work group members. Changes affected by members are to be e mailed to the FFS representative for entry into working draft.

On April 1, 2015: Attendee list attached.
A final review of the draft CWPP took place with changes and additions recorded. The FFS representative will finalize CWPP and deliver to LMS Chairman before April 14, 2015. This will allow ample time for LMS Committee approval and inclusion into the LMS as an appendix, the LMS review by state and local authorities and county commission adoption of the LMS by June 30, 2015.

November, 2015: Final draft of CWPP presented to the LMS Chairman for approval as an appendix to the LMS.

CWPP: Appendix B: Wildfire Vulnerability Assessment, Maps and Other Items

The Southern Wildfire Risk Assessment Portal

The Southern Wildfire Risk Assessment Portal (SouthWRAP) is a new tool being used by the Florida Forest Service. The goal: Increases awareness, communication and visualization of risk assessment data. With access to a basic computer and internet connection, the program can provide easy-to-use, consistent and high quality wildfire risk information, which presents a seamless statewide picture of wildfire risk.

Through access and analysis of county data, wildfire mitigation specialists, prevention planners, community leaders and citizens can generate maps and download wildfire risk information that represents specific areas of interest.

The SouthWRAP Professional Viewer allows for analysis of risk and mitigation projects in particular areas or across landscapes, as well as the generation of reports for those areas. The report is designed to enhance agency management plans, by providing maps and charts of the WUI, surface fuels, or fire behavior indices. For purposes of this CWPP, the areas of interest are called Community Protection Zones, or (CPZs).

Insert the SouthWRAP Wildfire Risk Assessment Portal Summary Report for Columbia County.
Insert additional maps not included in Summary Report. Examples: A map of Fire Stations/Fire Protection Areas, Road networks, Railway Networks, Evacuation Routes, Utility Corridors, Layered maps which Spotlight WUI CPZ and CPZ/Firewise projects, Hunt Camps within the Osceola National Forest, etc.

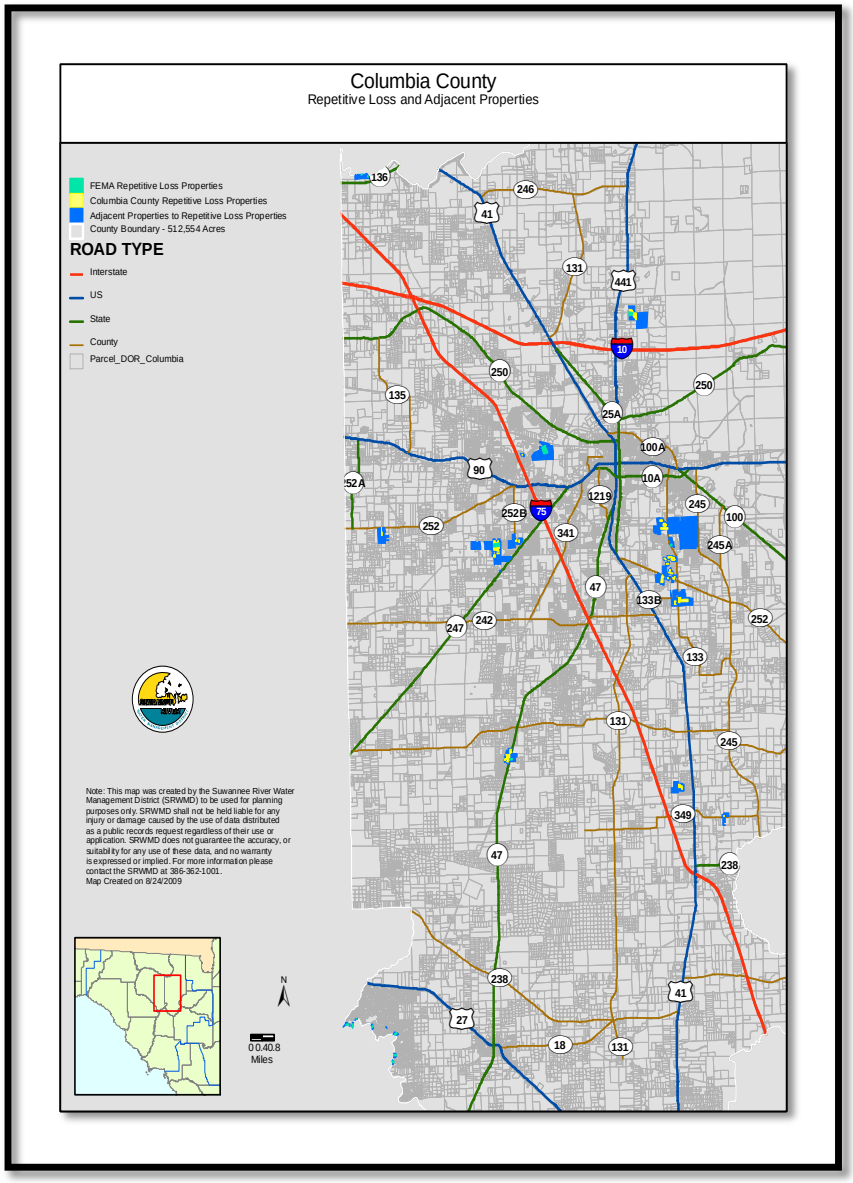
CWPP: Appendix C: CWPP/LMS Projects

Projects included here are those either suggested in the Goals and Objectives or described in the Action Plan of the CWPP. These Project Detail Sheets can be used for adding projects to the Local Mitigation Strategy Project List and applying for grant funding. The following information will be provided for each project, as available.

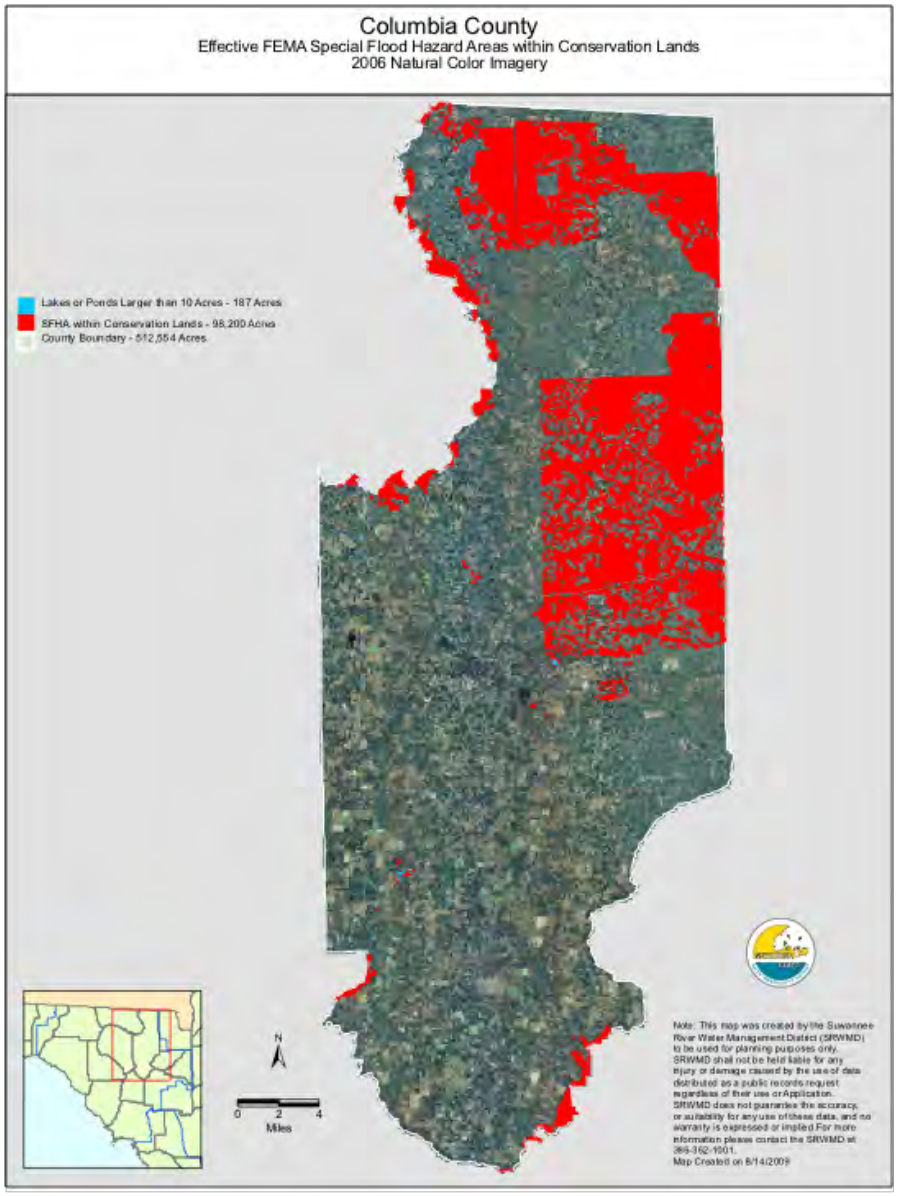
Project Name
Project Type [Wildland fuel management, outreach and education, Firewise, policy/regulations, or response improvement]
Timeframe for Implementation
Agency Responsible for Implementation
Project Description
Estimated Cost
Potential Funding Source
Target Population Benefited
    Estimated Size:
    Method for determining:
Partnerships for Implementation
Project Evaluation Criteria

Appendix III – Repetitive Loss Map and a Special Flood Hazard Map with Conservation Land

Columbia County Repetitive Loss Property Map



FEMA Special Flood Hazard Areas with Conservation Lands Map



Appendix IV – Road and Neighborhoods in Columbia County Prone to Flooding

Lake City Journal

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Roads and neighborhoods in Columbia County prone to flooding where the old Ichetucknee River once ran through them

By Karl Burkhardt

Lake City residents travelled from Alligator Lake to the Ichetucknee River by boat a century ago. Today, people take the same route, but it is called State Road 47.

Tributaries that flowed into the Ichetucknee River also have new names, including County Roads 240, 242 and 341.

The river went underground many years ago, following a series of channels through the limestone, marked on the surface by springs and sinks.

On rare occasions, the underground river fills to capacity.

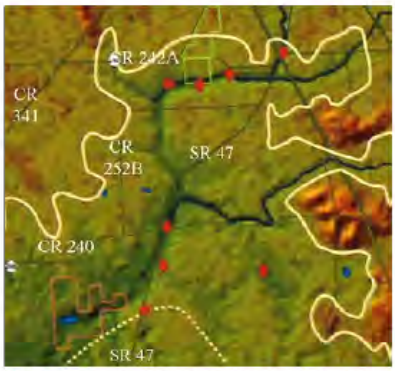
Then the old riverbed once again becomes a river and the tributaries overflow with rainwater.

People who own homes, businesses and farms suddenly are in the midst of a flood.

Lakes form in low lying areas that long ago had been lakes.

The Ichetucknee Trace is clearly visible on topographical maps. In fact, the old riverbed looks like a river, even when it is dry, because low places are shown in dark green.

Divers still follow the river underground, exploring and



Red diamonds mark the springs along the Ichetucknee Trace, shown in dark green lines. Roads follow the trace in many places and cross it in other locations. The yellow line follows the Cody Scarp. (SRWMD graphic, edited by the LakeCityJournal.com)

Columbia County workers are using vehicles with very large wheels to get to homes in flooded areas. (LakeCityJournal.com photo)

charting this natural wonder.

Visit Ichetucknee Underwater, a slide show provided by some of the best underwater photographers in the world.

One of the lowest areas is Callaway subdivision, off County Road 247. Many homes were flooded eight years ago in what has been described as a 100-year event. Some homes were demolished and others had extensive renovations.

Life returned to normal until last month. Relentless rain from Tropical Storm Debby put even more water into the subdivision. This may be designated a 500-year event. There is no guarantee that the next major flood will not happen for another 100 or 500 years.

FEMA National Flood Insurance, which is the only source for flood insurance, designated the area a flood zone. Flood insurance is not mandatory, but banks make it a requirement for a loan or mortgage.

And governments cannot stop people from building houses in flood zones.

"No government has the right to restrict completely the use of someone's property, unless the government wants to buy it, said County Manager Dale Williams at the July 5 commission meeting.

"The law says that all we can do is impose reasonable restrictions. Reasonable restrictions are a moving target and have, for the most part, been established by court law."

County Commissioner Jody DuPree, noted, "In 2006, a preliminary FEMA flood map was presented," DuPree said.

The areas that are now flooded are the ones designated as flood zones on that map.

"Operation and maintenance of that system was by the homeowners association," DuPree said. They were responsible for maintaining storm-water control systems.

"The Homeowners Association disbanded in 2004, abandoning that system," DuPree said.

Suwannee River Water Management, which has standards for storm-water retention ponds and drainage, requires that retention ponds be able to handle an inch of water per hour, DuPree said. Rain from Tropical Storm Debby was far greater than that.

SRWMD can limit use of wetlands. An expensive process called mitigation requires that an area, much larger than the one being used, be restored as a wetland and preserved forever.

Meanwhile, employees of Columbia County and the Suwannee River Water Management District, are using pumps to move the water to an available retention pond, and from there to an area that has drainage.

When the flood is over, homeowners who have flood insurance will collect on their policies and be allowed to repair the houses.

They will have the opportunity to buy the flood insurance, subsidized by the federal government because it would be prohibitively expensive for a commercial company to provide.

And Columbia County will be required to issue building permits, if the applications meet building standards.

One thing may change this year. Columbia County plans to put markers in flood zones, indicating historic high water levels.

Appendix V – Article 8, Flood Prevention Damage Regulations

Adopted: December 30, 2008, amended art. 8 in its entirety and enacted similar provision as set out herein

Reviewed In July 2015 – modifications included:

FOOTNOTE(S): --- (**1**) ---

Editor's note— Ord. No. 2008-53, § 1, adopted Dec. 30, 2008, amended art. 8 in its entirety and enacted similar provisions as set out herein. The former art. 8 derived from Ord. No. 98-1, adopted March 4, 1998.

ARTICLE 8. FLOOD PREVENTION DAMAGE REGULATIONS

SECTION 8.1 STATUTORY AUTHORIZATION, FINDINGS OF FACT, PURPOSE, AND OBJECTIVES.

The Legislature of the State of Florida has authorized and delegated in Chapter 125 Florida Statutes, the responsibility to local government units to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry. Therefore, the Board of County Commissioners of Columbia County, Florida does hereby adopt the following floodplain management regulations.

8.1.2 FINDINGS OF FACT The flood hazard areas of Columbia County are subject to periodic inundation, which results 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.

These flood losses are caused by the cumulative effect of obstructions in floodplains causing increases in flood heights and velocities, and by the occupancy in flood hazard areas by uses vulnerable to floods or hazardous to other lands, which are inadequately elevated, flood-proofed, or otherwise unprotected from flood damages.

8.1.3 STATEMENT OF PURPOSE It is the purpose of this article to promote the public health, safety and general welfare and to minimize public and private losses due to flood conditions in specific areas by provisions designed to:

1. Restrict or prohibit uses which are dangerous to health, safety and property due to water or erosion hazards, which result in damaging increases in erosion or in flood heights and velocities;

2. Require that uses vulnerable to floods including facilities, which serve such uses be protected against flood damage throughout their intended life span;
3. Control the alteration of natural floodplains, stream channels, and natural protective barriers, which are involved in the accommodation of flood waters;
4. Control filling, grading, dredging and other development, which may increase erosion or flood damage; and
5. Prevent or regulate the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards to other lands.

8.1.4 OBJECTIVES The objectives of this article are to:

1. Protect human life, health and to eliminate or minimize property damage;
2. Minimize expenditure of public money for costly flood control projects;
3. Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
4. Minimize prolonged business interruptions;
5. Minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, roadways, and bridges and culverts located in floodplains;
6. Maintain a stable tax base by providing for the sound use and development of flood prone areas in such a manner as to minimize flood blight areas; and
7. Ensure that potential homebuyers are notified that property is in a flood hazard area.

SECTION 8.2 DEFINITIONS

All words used in this Article, shall carry their customary dictionary meanings, except that the following words, terms and phrases, when used in this Article, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

Accessory structure (Appurtenant structure) means a structure that is located on the same parcel of property as the principal structure and the use of which is incidental to the use of the principal structure. Accessory structures should constitute a minimal investment, may not be used for human habitation, and be designed to have minimal flood damage potential. Examples of accessory structures are detached garages, carports, storage sheds, pole barns, and hay sheds.

Appeal means a request for a review of the Floodplain Administrator's interpretation of any provision of this article or a request for a variance.

Area of shallow flooding means a designated AO or AH Zone on the community's Flood

Insurance Rate Map (FIRM) with base flood depths from one to three feet where a clearly defined channel does not exist, where the path of flooding is unpredictable and indeterminate, and where velocity flow may be evident. Such flooding is characterized by ponding or sheet flow.

Area of special flood hazard is the land in the floodplain within a community subject to a one percent or greater chance of flooding in any given year. This term is synonymous with the phrase "special flood hazard area."

Base flood means the flood having a one percent chance of being equaled or exceeded in any given year (also called the "100-year flood" and the "regulatory flood"). Base flood is the term used throughout this article.

Base Flood Elevation means the water-surface elevation associated with the base flood.

Basement means that portion of a building having its floor sub-grade (below ground level) on all sides.

Breakaway wall means a wall that is not part of the structural support of the building and is intended through its design and construction to collapse under specific lateral loading forces without causing damage to the elevated portion of the building or the supporting foundation system.

Building – see Structure.
Coastal high hazard area means an area of special flood hazard extending from offshore to the inland limit of a primary frontal dune along an open coast and any other area subject to high velocity wave action from storms or seismic sources. The area is designated on the FIRM as Zone V1 – V30, VE, or V.

Datum A reference surface used to ensure that all elevation records are properly related. Many communities have their own datum that was developed before there was a national standard. For the purpose of this article, datum shall refer to the North American Vertical Datum (NAVD) of 1988, which is expressed in relation to mean sea level.

Development means any man-made change to improved or unimproved real estate, including, but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavating, drilling operations, or storage of materials or equipment.

Elevated building means a non-basement building built to have the lowest floor elevated above the ground level by foundation walls, posts, piers, columns, pilings, or shear walls.

Encroachment means the advance or infringement of uses, plant growth, fill, excavation, buildings, permanent structures or development into a floodplain, which may impede or alter the flow capacity of a floodplain.

Existing Construction means, for the purposes of floodplain management, structures for which "the start of construction" commenced before the data of the initial Flood Insurance Rate Map (FIRM). Existing construction, means for the purposes of determining rates structures for which the "start of construction" commenced before the effective date of the first FIRM. This term may also be referred to as "existing structures".

Existing manufactured home park or subdivision means a manufactured home park or subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including at a minimum the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed before the effective date of the floodplain management regulations adopted by a community.

Expansion to an existing manufactured home park or subdivision means the preparation of additional sites by the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads).

Flood or flooding means:

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

1. The overflow of inland or tidal waters.
2. The unusual and rapid accumulation or runoff of surface waters from any source.
3. Mudslides (i.e., mudflows), which are proximately caused by flooding as defined in paragraph (a) (2) of this definition and are akin to a river of liquid and flowing mud on the surface of normally dry land areas, as when earth is carried by a current of water and deposited along the path of the current.

b. The collapse or subsidence of land along a shore of a lake or other body of water as the result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels or suddenly caused by an unusually high water level in a natural body of water, accompanied by a severe storm or by an unanticipated force of nature, such as a flash flood or an abnormal tidal surge or by some similarly unusual and unforeseeable event, which results in flooding as defined in paragraph (a) (1) of this

definition.

Flood Boundary and Floodway Map (FBFM) means the official map of the community on which the Federal Emergency Management Agency (FEMA) has delineated the areas of special flood hazard and regulatory floodways.

Flood Hazard Boundary Map (FHBM) means an official map of the community, issued by FEMA, where the boundaries of the areas of special flood hazard have been identified as only Approximate Zone A.

Flood Insurance Rate Map (FIRM) means an official map of the community, issued by FEMA, which delineated both the areas of special flood hazard and the risk premium zones applicable to the community.

Flood Insurance Study (FIS) is the official hydraulic & hydrologic report provided by FEMA. The study contains an examination, evaluation, and determination of flood hazards, and, if appropriate, corresponding water surface elevations, or an examination, evaluation, and determination of mudslide (i.e., mudflow) and other flood-related erosion hazards. The study may also contain flood profiles, as well as the FIRM, FHBM (where applicable), and other related data and information.

Floodplain means any land area susceptible to being inundated by water from any source (see definition of “flooding”).

Floodplain management means the operation of an overall program of corrective and preventive measures for reducing flood damage and preserving and enhancing, where possible, natural resources in the floodplain, including but not limited to emergency preparedness plans, flood control works, floodplain management regulations, and open space plans.

Floodplain Administrator is the individual appointed to administer and enforce the floodplain management regulations of the community.

Floodplain management regulations means this article and other zoning ordinances, subdivision regulations, building codes, health regulations, special purpose ordinances (such as floodplain ordinance, grading ordinance, and erosion control ordinance), and other applications of police power which control development in flood-prone areas. This term describes Federal, State of Florida, or local regulations in any combination thereof, which provide standards for preventing and reducing flood loss and damage.

Floodproofing means any combination of structural and non-structural additions, changes, or

adjustments to structures, which reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures and their contents.

Floodway means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.

Floodway fringe means that area of the floodplain on either side of the regulatory floodway where encroachment may be permitted without additional hydraulic and/or hydrologic analysis. Freeboard means the additional height, usually expressed as a factor of safety in feet, above a flood level for purposes of floodplain management. Freeboard tends to compensate for many unknown factors, such as wave action, bridge openings and hydrological effect of urbanization of the watershed, that could contribute to flood heights greater than the height calculated for a selected frequency flood and floodway conditions.

Functionally dependent use means a use that cannot be used for its intended purpose unless it is located or carried out in close proximity to water, such as a docking or port facility necessary for the loading and unloading of cargo or passengers, shipbuilding or ship repair. The term does not include long-term storage, manufacture, sales, or service facilities.

Hardship as related to variances from this article means the exceptional hardship associated with the land that would result from a failure to grant the requested variance. The community requires that the variance is exceptional, unusual, and peculiar to the property involved. Mere economic or financial hardship alone is not exceptional. Inconvenience, aesthetic considerations, physical handicaps, personal preferences, or the disapproval of one's neighbors likewise cannot, as a rule, qualify as an exceptional hardship. All of these problems can be resolved through other means without granting a variance, even if the alternative is more expensive, or requires the property owner to build elsewhere or put the parcel to a different use than originally intended.

Highest adjacent grade means the highest natural elevation of the ground surface, prior to the start of construction, next to the proposed walls of a structure.

Historic Structure means any structure that is:

a) Listed individually in the National Register of Historic Places (a listing maintained by the Department of Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register:

b) Certified or preliminarily determined by the Secretary of the Interior as contributing to the

historical significance of a registered historic or a district preliminarily determined by the Secretary to qualify as a registered historic district:

c) Individually listed on the Florida inventory of historic places, which has been approved by the Secretary of the Interior; or

d) Individually listed on a local inventory of historic places in communities with historic preservation programs that have been certified either:

1. By the approved Florida program as determined by the Secretary of the Interior, or

2. Directly by the Secretary of the Interior.

Lowest adjacent grade means the lowest elevation, after the completion of construction, of the ground, sidewalk, patio, deck support, or basement entryway immediately next to the structure.

Lowest floor means the lowest floor of the lowest enclosed area (including basement). An unfinished or flood resistant enclosure, used solely for parking of vehicles, building access, or storage, in an area other than a basement, is not considered a building's lowest floor, provided that such enclosure is not built so as to render the structure in violation of the non-elevation design standards of this article.

Mangrove Stand means an assemblage of mangrove trees which are mostly low trees noted for a copious development of interlacing adventitious roots above ground and which contain one or more of the following species: Black mangrove (Avicennia Nitida); red mangrove (Rhizophora mangle); white mangrove (Languncularia Racemosa); and buttonwood (Conocarpus Erecta).

Manufactured home means a building, transportable in one or more sections, which is built on a permanent chassis and designed to be used with or without a permanent foundation when connected to the required utilities. The term also includes park trailers, travel trailers, and similar transportable structures placed on a site for 180 consecutive days or longer and intended to be improved property.

Manufactured home park or subdivision means a parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale.

Market value means the building value, which is the property value excluding the land value and that of the detached accessory structures and other improvements on site (as agreed to between a willing buyer and seller) as established by what the local real estate market will bear. Market value can be established by an independent certified appraisal (other than a limited or

curbside appraisal, or one based on income approach), Actual Cash Value (replacement cost depreciated for age and quality of construction of building), or adjusted tax-assessed values.

Mean Sea Level means the average height of the sea for all stages of the tide. It is used as a reference for establishing various elevations within the floodplain. For purposes of this article, the term is synonymous with North American Vertical Datum (NAVD) of 1988.

National Geodetic Vertical Datum (NGVD) of 1929 means a vertical control used as a reference for establishing varying elevations within the floodplain.

New Construction means, for floodplain management purposes, any structure for which the "start of construction" commenced on or after the effective date of the initial floodplain management code, ordinance, or standard based upon specific technical base flood elevation data that establishes the area of special flood hazard – include only one date. The term also includes any subsequent improvements to such structures. For flood insurance rates, structures for which the start of construction commenced on or after the effective date of the date of an initial FIRM or after December 31, 1974, whichever is later – include only one date, and includes any subsequent improvements to such structures.

New manufactured home park or subdivision means a manufactured home park or subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed on or after the effective date of the first floodplain management code, ordinance or standard.

North American Vertical Datum (NAVD) of 1988 means a vertical control used as a reference for establishing varying elevations within the floodplain.

Free of Obstruction means any type of lower area enclosure or other construction element that will obstruct the flow of velocity water and wave action beneath the lowest horizontal structural member of the lowest floor of an elevated building during a base flood event is not allowed. This requirement applies to the structures in velocity zones (V-Zones).

Program deficiency means a defect in the community's floodplain management regulations or administrative procedures that impairs effective implementation of those floodplain management regulations or of the standards required by the National Flood Insurance Program.

Public safety and nuisance means anything which is injurious to safety or health of the entire community or a neighborhood, or any considerable number of persons, or unlawfully obstructs the free passage or use, in the customary manner, of any navigable lake, or river, bay, stream,

canal, or basin.

Recreational vehicle (RV) as defined in Florida Statutes 320.01(1)(b)1.-8., as amended.
Regulatory floodway means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.

Remedy a deficiency or violation means to bring the regulation, procedure, structure or other development into compliance with State of Florida, Federal or local floodplain management regulations; or if this is not possible, to reduce the impacts of its noncompliance. Ways the impacts may be reduced include protecting the structure or other affected development from flood damages, implementing the enforcement provisions of this article or otherwise deterring future similar violations, or reducing Federal financial exposure with regard to the structure or other development.

Riverine means relating to, formed by, or resembling a river (including tributaries), stream, brook, etc.

Sand dune means naturally occurring accumulations of sand in ridges or mounds landward of the beach.
Shallow flooding means the same as area of shallow flooding.

Special flood hazard area means the same as area of special flood hazard.

Start of construction For other than new construction or substantial improvements under the Coastal Barrier Resources Act P. L. 97-348, includes substantial improvement, and means the date the building permit was issued, provided the actual start of construction, repair, reconstruction, or improvement was within 180 days of the permit date. The actual start means the first placement of permanent construction of a building (including a manufactured home) on a site, such as the pouring of slabs or footings, installation of piles, construction of columns, or any work beyond the stage of excavation or placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main building. For substantial improvement, the actual start of construction means the first alteration of any wall, ceiling, floor, or other structural part of a building, whether or not that alteration affects the external dimensions of the building.

Storm cellar means a place below grade used to accommodate occupants of the structure and

emergency supplies as a means of temporary shelter against severe tornadoes or similar windstorm activity.

Structure means for floodplain management purposes a walled and roofed building, including gas or liquid storage tank that is principally above ground, as well as a manufactured home. Substantial damage means damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

Substantial improvement means any reconstruction, rehabilitation, addition, or other improvement of a structure, the cumulative cost of which equals or exceeds 50 percent of the market value of the structure before the "start of construction" of the improvement. This term includes structures that have incurred "substantial damage" regardless of the actual repair work performed. This term does not, however, include any repair or improvement of a structure to correct existing violations of State of Florida or local health, sanitary, or safety code specifications, which have been identified by the local code enforcement official prior to the application for permit for improvement, and which are the minimum necessary to assure safe living conditions.

Substantially improved existing manufactured home parks or subdivisions is where the repair, reconstruction, rehabilitation or improvement of the streets, utilities and pads equals or exceeds 50 percent of the value of the streets, utilities and pads before the repair, reconstruction or improvement commenced.

Variance is a grant of relief from the requirements of this article.

Violation means the failure of a structure or other development to be fully compliant with the requirements of this article. A structure or other development without the elevation certificate, other certifications, or other evidence of compliance required in this article is presumed to be in violation until such time as that documentation is provided.

Watercourse means a lake, river, creek, stream, wash, channel or other topographic feature on or over which waters flow at least periodically. Watercourse includes specifically designated areas in which substantial flood damage may occur.

Water surface elevation means the height, in relation to the North American Vertical Datum (NAVD) of 1988, of floods of various magnitudes and frequencies in the floodplains of coastal or riverine areas.

SECTION 8.3 GENERAL PROVISIONS

8.3.1 LANDS TO WHICH THIS ARTICLE APPLIES This article shall apply to all areas of special flood hazard within the jurisdiction of the Board of County Commissioners of Columbia County, Florida.

8.3.2 BASIS FOR ESTABLISHING THE AREAS OF SPECIAL FLOOD HAZARD The areas of special flood hazard identified by the Federal Emergency Management Agency in the Flood Insurance Study (FIS) for Columbia County, Florida, dated February 4, 2009, with the accompanying maps and other supporting data, and any subsequent revisions thereto, are adopted by reference and declared to be a part of this article. The Flood Insurance Study and Flood Insurance Rate Map (FIRM) are on file at the Columbia County Building and Zoning Department.

8.3.3 DESIGNATION OF FLOODPLAIN ADMINISTRATOR The Board of County Commissioners of Columbia County, Florida hereby appoints the Land Development Regulation Administrator to administer and implement the revisions of this article and is herein referred to as the Floodplain Administrator.

8.3.4 ESTABLISHMENT OF DEVELOPMENT PERMITS A development permit shall be required in conformance with the provisions of this article prior to the commencement of any development activities.

8.3.5 COMPLIANCE No structure or land shall hereafter be located, extended, converted or structurally altered without full compliance with the terms of this article and other applicable regulations.

8.3.6 ABROGATION AND GREATER RESTRICTIONS This article is not intended to repeal, abrogate, or impair any existing easements, covenants, or deed restrictions. However, where this article and another conflict or overlap, whichever imposes the more stringent restrictions shall prevail.

8.3.7 INTERPRETATION In the interpretation and application of this article all provisions shall be:

1. Considered as minimum requirements;
2. Liberally construed in favor of the governing body; and
3. Deemed neither to limit nor repeal any other powers granted under State

of Florida statutes.

8.3.8 WARNING AND DISCLAIMER OF LIABILITY The degree of flood protection required by this article is considered reasonable for regulatory purposes and is based on scientific and engineering consideration. Larger floods can and will occur on rare occasions. Flood heights may be increased by manmade or natural causes. This article does not imply that land outside the areas of special flood hazard or uses permitted within such areas will be free from flooding or flood damages. This article shall not create liability on the part of the Board of County Commissioners of Columbia County, Florida or by any officer or employee thereof for any flood damages that result from reliance on this article or any administrative decision lawfully made thereunder.

8.3.9 PENALITIES FOR VIOLATION Violation of the provisions of this article or failure to comply with any of its requirements, including violation of conditions and safeguards established in connection with grants of variance or special exceptions, shall be punishable for a non-criminal violation. Any person who violates this article or fails to comply with any of its requirements shall, upon adjudication therefore, be fined not more than $500, and in addition, shall pay all costs and expenses involved in the case. Each day such violation Continues, shall be considered a separate offense. Nothing herein contained shall prevent the Floodplain Administrator from taking such other lawful actions as is necessary to prevent or remedy any violation.

SECTION 8.4 ADMINISTRATION

8.4.1 PERMIT PROCEDURES Application for a Development Permit shall be made to the Floodplain Administrator on forms furnished by him or her prior to any development activities, and may include, but not be limited to, the following plans in duplicate drawn to scale showing the nature, location, dimensions, and elevations of the area in question; existing or proposed structures, earthen fill, storage of materials or equipment, drainage facilities, and the location of the foregoing. Specifically, the following information is required:

1. Application Stage:

a. Elevation in relation to mean sea level of the proposed lowest floor (including basement) of all buildings;
b. Elevation in relation to mean sea level to which any non-residential

building will be flood-proofed;
c. Certificate from a registered professional engineer or architect that the non-residential flood-proofed building will meet the floodproofing criteria in Section 8.4.1(2), and Section 8.5.2.(2);
d. Description of the extent to which any watercourse will be altered or relocated as a result of proposed development; and
e. Elevation in relation to mean sea level of the bottom of the lowest horizontal structural member of the lowest floor and provide a certification from a registered engineer or architect indicating that they have developed and or reviewed the structural designs, specifications and plans of the construction and certified that are in accordance with accepted standards of practice in Coastal High Hazard Areas.

2. Construction Stage:

Upon placement of the lowest floor, or flood-proofing by whatever construction means, or bottom of the lowest horizontal structural member it shall be the duty of the permit holder to submit to the Floodplain Administrator a certification of the NGVD or NAVD elevation of the lowest floor or flood-proofed elevation, or bottom of the lowest horizontal structural member as built, in relation to mean sea level. Said certification shall be prepared by or under the direct supervision of a registered land surveyor or professional engineer and certified by same. When flood proofing is utilized for a particular building said certification shall be prepared by or under the direct supervision of a professional engineer or architect and certified by same. Any work undertaken prior to submission of the certification shall be at the permit holder's risk. The Floodplain Administrator shall review the lowest floor and flood-proofing elevation survey data submitted. The permit holder immediately and prior to further progressive work being permitted to proceed shall correct violations detected by such review. Failure to submit the survey or failure to make said corrections required hereby, shall be cause to issue a stop-work order for the project.

8.4.2 DUTIES AND RESPONSIBILITIES OF THE FLOODPLAIN ADMINISTRATOR Duties of the Administrator shall include, but are not be limited to:

1. Review permits to assure sites are reasonably safe from flooding;
2. Review all development permits to assure that the permit requirements of this

article have been satisfied;

3. Advise permittee that additional Federal, State of Florida, or local permits may be required, and if such additional permits are necessary, especially as it relates to Chapters 161.053; 320.8249; 320.8359; 373.036; 380.05; 381.0065, and 553, Part IV, Florida Statutes, require that copies of such permits be provided and maintained on file with the development permit;
4. Notify adjacent communities, the Department of Community Affairs, Division of Emergency Management, the Suwannee River Water Management District, the Federal Emergency Management Agency and other Federal and/or State of Florida agencies with statutory or regulatory authority prior to any alteration or relocation of a watercourse;
5. Assure that maintenance is provided within the altered or relocated portion of said watercourse so that the flood-carrying capacity is maintained;
6. Verify and record the actual elevation (in relation to mean sea level) of the lowest floor (A-Zones) or bottom of the lowest horizontal structural member of the lowest floor (V-Zones) of all new or substantially improved buildings, in accordance with Section 8.5.2.(1) and (2) and Section 8.5.5.(2), respectively;
7. Verify and record the actual elevation (in relation to mean sea level) to which the new or substantially improved buildings have been flood-proofed, in accordance with Section 8.5.2.(2);
8. Review certified plans and specifications for compliance. When floodproofing is utilized for a particular building, certification shall be obtained from a registered engineer or architect certifying that all areas of the building below the required elevation are water tight with walls substantially impermeable to the passage of water, and use structural components having the capability of resisting hydrostatic and hydrodynamic loads and the effects of buoyancy in compliance with Section 8.5.2.(2) of this section;
9. Interpret the exact location of boundaries of the areas of special flood hazard. When there appears to be a conflict between a mapped boundary and actual field conditions, the Floodplain Administrator shall make the necessary Interpretation. The person contesting the location of the boundary shall be given a reasonable opportunity to appeal the interpretation as provided in this article;
10. When base flood elevation data or floodway data have not been provided in accordance with Section 8.3.3, the Floodplain Administrator shall obtain, review and reasonably utilize any base flood elevation and floodway data available from a Federal, State of Florida, or any other source, in order to administer the provisions of Section 8.5;
11. Coordinate all change requests to the FIS, FIRM and FBFM with the

requester, State of Florida, and FEMA, and

12. Where Base Flood Elevation is utilized, obtain and maintain records of lowest floor and floodproofing elevations for new construction and substantial improvements in accordance with Section 8.5.2.(1) and (2), respectively.

SECTION 8.5 PROVISIONS FOR FLOOD HAZARD REDUCTION

8.5.1 GENERAL STANDARDS In all areas of special flood hazard, all development sites including new construction and substantial improvements shall be reasonably safe from flooding, and meet the following provisions:

1. New construction and substantial improvements shall be designed or modified and adequately anchored to prevent flotation, collapse or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy;
2. Manufactured homes shall be anchored to prevent flotation, collapse, or lateral movement. Methods of anchoring may include, but are not limited to, use of over-the-top or frame ties to ground anchors. This standard shall be in addition to and consistent with applicable State of Florida requirements for resisting wind forces;
3. New construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage. See the applicable Technical Bulletin or Bulletins for guidance;
4. New construction or substantial improvements shall be constructed by methods and practices that minimize flood damage. See the applicable Technical Bulletin or Bulletins for guidance;
5. Electrical, heating, ventilation, plumbing, air conditioning equipment and other service facilities, including duct work, shall be designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding;
6. New and replacement water supply systems shall be designed to minimize or eliminate infiltration of floodwaters into the system;
7. New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of floodwaters into the systems and discharges from the systems into flood waters;
8. On-site waste disposal systems shall be located and constructed to avoid Impairment to them or contamination from them during flooding;
9. Any alteration, repair, reconstruction or improvements to a building that is in compliance with the provisions of this article shall meet the requirements of “new construction” as contained in this article;

10. Any alteration, repair, reconstruction or improvements to a building that is not in compliance with the provisions of this article, shall be undertaken only if said non-conformity is not furthered, extended, or replaced;
11. All applicable additional Federal, State of Florida, and local permits shall be obtained and submitted to the Floodplain Administrator. Copies of such permits shall be maintained on file with the development permit. State of Florida permits may include, but not be limited to the following:
    a. Suwannee River Water Management District(s): in accordance with Chapter 373.036 Florida Statutes, Section (2)(a) – Flood Protection and Floodplain Management.
    b. Department of Community Affairs: in accordance with Chapter 380.05 F.S. Areas of Critical State Concern, and Chapter 553, Part IV F.S., Florida Building Code.
    c. Department of Health: in accordance with Chapter 381.0065 F.S. Onsite Sewage Treatment and Disposal Systems.
    d. Department of Environmental Protection, Coastal Construction Control Line: in accordance with Chapter 161.053 F.S. Coastal Construction and Excavation.
12. Standards for Subdivision Proposals and other Proposed Development (including manufactured homes):
    a. All subdivision proposals shall be consistent with the need to minimize flood damage;
    b. All subdivision proposals shall have public utilities and facilities such as sewer, gas, electrical, and water systems located and constructed to minimize or eliminate flood damage;
    c. All subdivision proposals shall have adequate drainage provided to reduce exposure to flood hazards.

8.5.2 SPECIFIC STANDARDS In all A-Zones where base flood elevation data have been provided (Zones AE, A1–30, and AH), as set forth in Section 8.3.2, the following provisions shall apply:

1. Residential Construction. All new construction or substantial improvement of any residential building (including manufactured home) shall have the lowest floor, including basement, elevated to no lower than one foot above the base flood elevation. Should solid foundation perimeter walls be used to elevate a structure, openings sufficient to facilitate automatic equalization of flood hydrostatic forces on both sides of the exterior walls shall be provided in accordance with standards of Section 8.5.2.3.

2. Non-Residential Construction. All new construction or substantial improvement of any commercial, industrial, or non-residential building (including manufactured home) shall have the lowest floor, including basement, elevated to no lower than one foot above the base flood elevation. All buildings located in A-Zones may be flood-proofed, in lieu of being elevated, provided that all areas of the building components below the base flood elevation plus one foot are water tight with walls substantially impermeable to the passage of water, and use structural components having the capability of resisting hydrostatic and hydrodynamic loads and the effects of buoyancy. A registered professional engineer or architect shall certify that the standards of this subsection are satisfied using the FEMA Floodproofing Certificate. Such certification along with the corresponding engineering data, and the operational and maintenance plans shall be provided to the Floodplain Administrator.

3. Elevated Buildings. New construction or substantial improvements of elevated buildings that include fully enclosed areas formed by foundation and other exterior walls below the lowest floor elevation shall be designed to preclude finished living space and designed to allow for the entry and exit of floodwaters to automatically equalize hydrostatic flood forces on exterior walls.

a. Designs for complying with this requirement must either be certified by a professional engineer or architect or meet the following minimum criteria:

1. Provide a minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding;
2. The bottom of all openings shall be no higher than one foot above foundation adjacent interior grade (which must be equal to or higher in elevation than the adjacent exterior grade); and
3. Openings may be equipped with screens, louvers, valves, or other coverings or devices provided they provide the required net area of the openings and permit the automatic flow of floodwaters in both directions.

b. Fully enclosed areas below the lowest floor shall solely be used for

parking of vehicles, storage, and building access. Access to the enclosed area shall be minimum necessary to allow for parking of vehicles (garage door), limited storage of maintenance equipment used in connection with the premises (standard exterior door), or entry to the living area (stairway or elevator); and

c. The interior portion of such enclosed area shall not be finished or partitioned into separate rooms.

4. Standards for Manufactured Homes and Recreational Vehicles

a. All manufactured homes that are placed, or substantially improved within Zones A1-30, AH, and AE, on sites (i) outside of an existing manufactured home park or subdivision, (ii) in a new manufactured home park or subdivision, (iii) in an expansion to an existing manufactured home park or subdivision, or (iv) in an existing manufactured home park or subdivision on which a manufactured home has incurred "substantial damage" as the result of a flood, the lowest floor be elevated on a permanent foundation to no lower than one foot above the base flood elevation and be securely anchored to an adequately anchored foundation system to resist flotation, collapse, and lateral movement.

b. All manufactured homes to be placed or substantially improved in an existing manufactured home park or subdivision within Zones A-1, AH, and AE, that are not subject to the provisions of Section 8.5.2.4.(a) of this Article, must be elevated so that either:

1. The lowest floor of the manufactured home is elevated to no lower than one foot above the base flood elevation, or
2. The manufactured home chassis is supported by reinforced piers or other foundation elements of at least an equivalent strength that are no less than 36 inches in height above the grade and securely anchored to an adequate foundation system to resist flotation, collapse, and lateral movement.

c. All recreational vehicles placed on sites within Zones A1-30.

AH, and AE must either:

1. Be on the site for fewer than 180 consecutive days,
2. Be fully licensed and ready for highway use (a recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick disconnect type utilities and security devices and has no permanently attached additions), or
3. Meet all the requirements for new construction, including anchoring and elevation requirements in accordance with Section 8.5.2.4 (a) and (b) of this Article.

5. Adequate drainage paths around structures shall be provided on slopes to guide water away from structures.

6. Standards for established Base Flood Elevations, without Regulatory Floodways located within the areas of special flood hazard established in Section 8.3.2 and where streams exist for which base flood elevation data has been provided by the Federal Emergency Management Agency without the delineation of the regulatory floodway (Zones AE and A1-30), the following additional provisions shall also apply.

   a. Until a regulatory floodway is designated, no new construction, substantial improvements, or other development including fill shall be permitted within the areas of special flood hazard, unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development will not increase the water surface elevation of the base flood more than one foot at any point within the community.

   b. Development activities which increase the water surface elevation of the base flood by more than one foot may be allowed, provided that the developer or applicant first applies – with the community's endorsement – for a conditional FIRM revision, and receives the approval of the Federal Emergency Management Agency.

7. Floodways. Located within areas of special flood hazard established in Section 8.3.2, are areas designated as floodways. Since the floodway is an

extremely hazardous area due to the velocity of flood waters which carry debris, potential projectiles and have significant erosion potential, the following additional provisions shall also apply:

a. Prohibit encroachments, including fill, new construction, substantial improvements and other developments within the regulatory floodway unless certification (with supporting technical data) by a registered professional engineer is provided through hydraulic and hydrologic analyses performed in accordance with standard engineering practice demonstrating that encroachments would not result in any increase in flood levels during occurrence of the base flood discharge.

b. Prohibit the placement of manufactured homes (mobile homes), except in an existing manufactured homes (mobile homes) park or subdivision. A replacement manufactured home may be placed on a lot in an existing manufactured home park or subdivision provided the anchoring standards of Section 8.5.1.(2), and the elevation standards of Section 8.5.2.(1) and (2), and the encroachment standards of Section 8.5.2.(7).(a), are met.

c. Development activities including new construction and substantial improvements that increase the water surface elevation of the base flood by more than one foot may be allowed, provided that the developer or applicant first applies – with the community's endorsement – for a conditional FIRM revision, and receives the approval of FEMA.

d. When fill is proposed, in accordance with the permit issued by the Florida Department of Health, within the regulatory floodway, the development permit shall be issued only upon demonstration by appropriate engineering analyses that the proposed fill will not increase the water surface elevation of the base flood in accordance with Section 8.5.7.(a).

8.5.3 SPECIFIC STANDARDS FOR A-ZONES WITHOUT BASE FLOOD ELEVATIONS AND REGULATORY FLOODWAYS Located within the areas

of special flood hazard established in Section 8.3.2, where there exist A Zones for which no base flood elevation data and regulatory floodway have been provided or designated by the Federal Emergency Management Agency, the following provisions shall apply:

1. Require standards of Section 8.5.1.

2. The Floodplain Administrator shall obtain, review, and reasonably utilize any base flood elevation and floodway data available from a Federal, State of Florida, or any other source, in order to administer the provisions of this article. When such data is utilized, provisions of Section 8.5.2, shall apply. The Floodplain Administrator shall:

a. Obtain the elevation (in relation to the mean sea level) of the lowest floor (including the basement) of all new and substantially improved structures,

b. Obtain, if the structure has been floodproofed in accordance with the requirements of Section 8.5.2.2, the elevation in relation to the mean sea level to which the structure has been floodproofed, and

c. Maintain a record of all such information.

3. Notify, in riverine situations, adjacent communities, the State of Florida, Department of Community Affairs, NFIP Coordinating Office, and the applicable Water Management District prior to any alteration or relocation of a watercourse, and submit copies of such notifications to FEMA.

4. Assure that the flood carrying capacity within the altered or relocated portion of any watercourse is maintained.

5. Manufactured homes shall be installed using methods and practices that minimize flood damage. They must be elevated and anchored to prevent flotation, collapse, or lateral movement. Methods of anchoring may include, but are not limited to, use of over-the-top or frame ties to ground anchors. This requirement is in addition to applicable State of Florida and local anchoring requirements for resisting wind forces.

6. When the data is not available from any source as in paragraph (2) of this Section, the lowest floor of the structure shall be elevated to at least two

(2) feet above highest elevation of any adjacent unpaved road, or unpaved access easement; or at least one (1) foot above the highest elevation on any adjacent paved road or paved access easement.

7. No encroachments, including fill material or structures, shall be located within a distance of the stream bank equal to 2 (two) times the width of the stream at the top of the bank or 50 (fifty) feet each side from the top of the bank, whichever is greater, unless certification by a registered professional engineer is provided demonstrating that such encroachment shall not result in any increase in flood levels during the occurrence of the base flood discharge.

8. Require that all new subdivision proposals and other proposed developments (including proposals for manufactured home parks and subdivisions) greater than 50 lots or 5 aces, whichever is the lesser, include within such proposals base flood elevation data.

8.5.4 STANDARDS FOR AO-ZONES Located within the areas of special flood hazard established in Section 8.3.2, are areas designated as shallow flooding areas. These areas have flood hazards associated with base flood depths of one to three feet, where a clearly defined channel does not exist and the path of flooding is unpredictable and indeterminate; therefore, the following provisions apply:

1. All new construction and substantial improvements of residential structures in all AO Zones shall have the lowest floor, including basement, elevated above the highest adjacent grade at least as high as the depth number specified in feet on the Flood Insurance Rate Map. If no flood depth number is specified, the lowest floor, including basement, shall be elevated to no less than two feet above the highest adjacent grade.

2. All new construction and substantial improvements of non-residential structures shall:

a. Have the lowest floor, including basement, elevated above the highest adjacent grade at least as high as the depth number specified in feet on the Flood Insurance Rate Map. If no flood depth number is specified, the lowest floor, including basement, shall be elevated to at least two feet above the highest adjacent grade, or

b. Together with attendant utility and sanitary facilities be completely floodproofed to that level to meet the floodproofing standard

specified in Section 8.5.2.2.

3. Adequate drainage paths around structures shall be provided on slopes to guide water away from structures.

SECTION 8.6 APPEALS AND VARIANCE PROCEDURES.

8.6.1 DESIGNATION OF APPEALS BOARD AND PROCEDURES The Columbia County, Florida, Board of Adjustment shall hear and decide appeals when it is alleged there is an error in any requirement, decision, or determination made by the Land Development Regulation Administrator in the enforcement or administration of Article 8 of these land development regulations.

1. Any such appeal shall be in written form and filed within thirty (30) days of the decision of the Land Development Regulation Administrator, and filed with the Land Development Regulation Administrator. Such appeal shall state the location of the property, the date of the notice of violations, and the number of such notice. The appellant must state the modification requested, the reasons therefor, and the hardship or conditions upon which the appeal is made.
Standing to appeal shall be limited to those property owners affected by the decision of the Land Development Regulation Administrator.

2. Decision. In passing upon such appeal, the Board of Adjustment shall consider all technical evaluations, all relevant factors, and standards specified in Article 9 of these land development regulations.

a. Upon consideration of the factors of Article 8 herein the Board of Adjustment may attach such conditions to the granting of modifications to the Land Development Regulation Administrator's determination as it deems necessary to further the purposes of Article 8 of these land development regulations.

3. Any person or persons, jointly or severally, aggrieved by any decision of the Columbia County Board of Adjustment may appeal as set out in Section 12.1.6.6 of these land development regulations.

8.6.2 DESIGNATION OF VARIANCE BOARD The Board of County Commissioners Columbia County, Florida shall hear request for variances from the requirements of this article. Any person aggrieved by the decision of the

board may appeal such decision to the Circuit Court as set out in Section 12.1.6.6 of these land development regulations.

8.6.3 VARIANCE PROCEDURES In acting upon such applications, the Board of County Commissioners shall consider all technical evaluations, all relevant Factors, standards specified in other sections of this article, and:

1. The danger that materials may be swept onto other lands to the injury of others;
2. The danger of life and property due to flooding or erosion damage;
3. The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner;
4. The importance of the services provided by the proposed facility to the community;
5. The necessity to the facility of a waterfront location, where applicable;
Adopted 31 December 2008
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6. The availability of alternative locations for the proposed use which are not subject to flooding or erosion damage;
7. The compatibility of the proposed use with existing and anticipated development;
8. The relationship of the proposed use to the comprehensive plan and floodplain management program for that area;
9. The safety of access to the property in times of flood for ordinary and emergency vehicles;
10. The expected heights, velocity, duration, rate of rise, and sediment of transport of the floodwaters and the effects of wave action, if applicable, expected at the site; and
11. The costs of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical, and water systems, and streets and bridges.

8.6.4 CONDITIONS FOR VARIANCES

1. Variances shall only be issued when there is:
   a. A showing of good and sufficient cause;
   b. A determination that failure to grant the variance would result in exceptional hardship;
   c. A determination that the granting of a variance will not

result in increased flood heights if certified by a professional engineer registered in the State of Florida; and
d. A determination that the granting of a variance will not result in additional threats to public expense, create nuisance, cause fraud on or victimization of the public, or conflict with existing local laws or ordinances.

2. Variances shall only be issued upon a determination that the variance is the minimum necessary deviation from the requirements of this article.
3. Variances shall not be granted after-the-fact.
4. The Floodplain Administrator shall maintain the records of all variance actions, including justification for their issuance or denial, and report such variances in the community's NFIP Biennial Report or upon request to FEMA and the State of Florida, NFIP and the Coordinating Office.

8.6.5 VARIANCE NOTIFICATION Any applicant to whom a variance is granted shall be given written notice over the signature of a community official that:

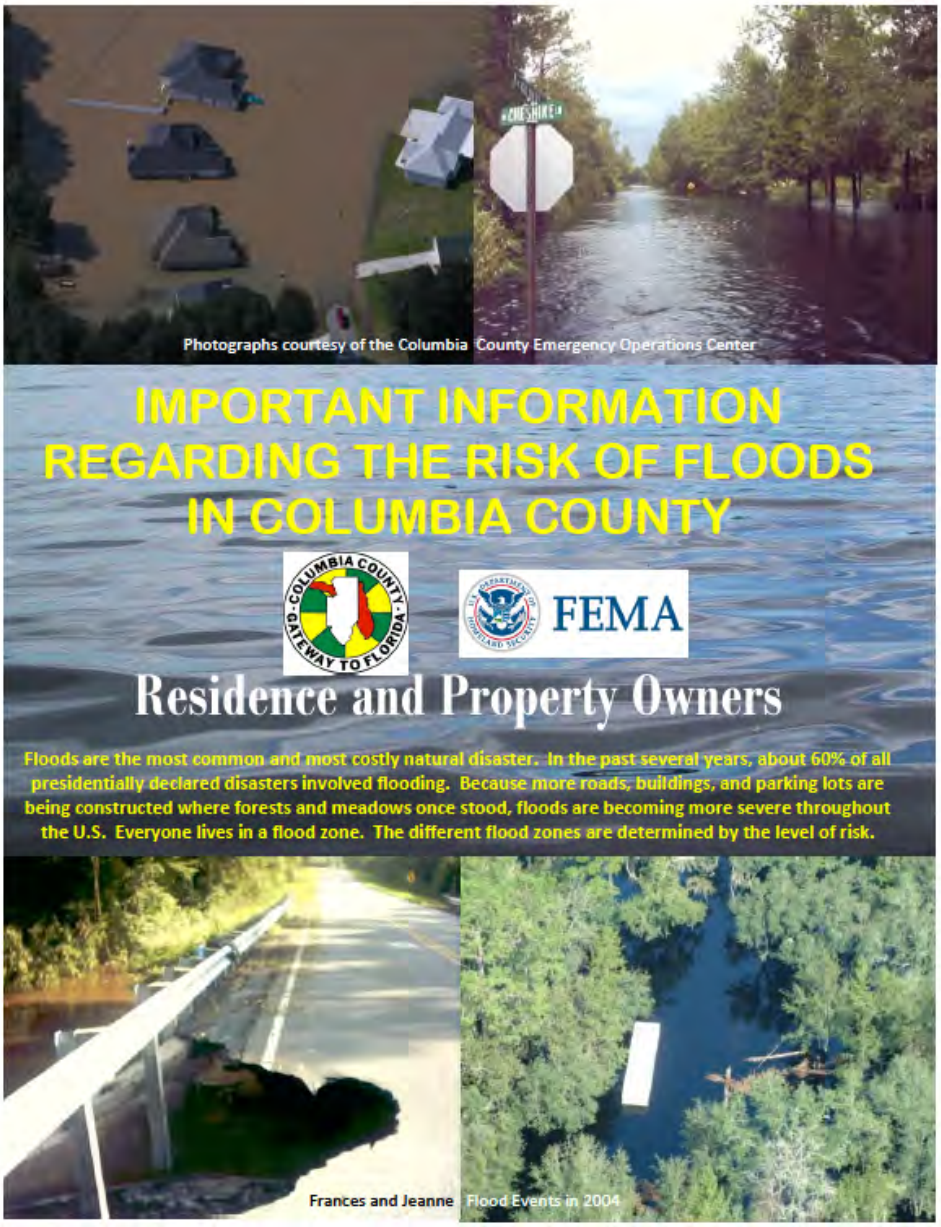
1. Specifying the difference between the base flood elevation and the elevation to which the structure is constructed;
2. The issuance of a variance to construct a structure below the base flood elevation will result in increased premium rates for flood insurance will be commensurate with the increased risk resulting from the reduced lowest ; floor elevation and
3. Such construction below the base flood level increases risks to life and property.

A copy of the notice shall be recorded by the Floodplain Administrator in the Office of the Clerk of Court and shall be recorded in a manner so that it appears in the chain of title of the affected parcel of land.

8.6.6 HISTORIC STRUCTURES Variances may be issued for the repair or rehabilitation of "historic" structures – meeting the definition in this article upon a determination that the proposed repair or rehabilitation will not preclude the structure's continued designation as a "historic" structure.

8.6.7 STRUCTURES IN REGULATORY FLOODWAY Variances shall not be Issued within any designated floodway if any impact in flood conditions or Increase in flood levels during the base flood discharge would result.

Appendix VI – Flood Mitigation Outreach Material for the County Residents



THE LOCAL FLOOD HAZARD

In Columbia County, the primary threat of flooding results from the "ponding" of water during heavy storms and the Suwannee and Santa Fe rivers reaching flood stage. Some flooding can result from overflow of small ditches and streams during significant storm events. Since Columbia County is relatively flat with low-lying areas, storm water sometimes simply overwhelms street drainage and water retention areas. Leaves and other debris can clog storm drains, culverts, and drainage swales, causing water to back up into lower-lying areas. Residents are encouraged not to blow yard waste (i.e. grass clippings, leaves, and small branches) into the street to prevent clogging of the storm water grates, culverts, and other similar devices. County floods of record have occurred in 1928, 1948, 1959, 1964, 1973, 1984, 1986, 1991, and 1998. High water data for these events is available from the Suwannee River Water Management District at **(386) 362-1001.**

THE FLOOD WARNING SYSTEM

In the event of a major storm, Columbia County receives notification from the Emergency Operations Center and certain County departments are put on alert. Local news media sources (radio and television) are notified and distribute instructions to the public. If needed, the Columbia County Fire and Sheriff's Departments may notify area residents by door-to-door personal contact, telephone, and use of sirens and public address systems. During significant storms, the Sheriff's Department and Fire Department monitor storm updates and pass information on to media sources for distribution.

COLUMBIA COUNTY EMERGENCY OPERATIONS CENTER (EOC) www.columbiacountyem.com

Use the Columbia County Emergency Operations Center web site to locate storm information, alerts and helpful information before a disaster happens. Columbia County Emergency Operations Center **(386-758-1126)** works with the National Weather Service and the National Hurricane Center to monitor flood and storm threats and advises the community accordingly. When a storm or flood threatens to impact the County, County staff monitors the event relying on information from various officials and the National Weather Service for detailed and site specific information regarding storm conditions and flood threats. The National Weather Service issues updates, warnings, and evacuation notices.

The following stations service the Columbia County area:

Radio: WDSR-FM 1340, WJTK-FM 96.5, WCJX-FM 106.5, and WNFB-FM 94.3,
Satellite TV Channels: 4, 12, 25, 30, and 47 and **Cable TV Channels:** 6, 8 and WCJB TV20

Report yourself as "Safe and Well" to family and friends...

If you have been affected by a disaster, this website provides a way for you to register yourself as "safe and well". From a list of standard messages, you can select those that you want to communicate to your family members, letting them know of your well-being.

Two main functions:

- *List yourself as Safe and Well:* Person/Family affected by a disaster creates a safe and well registration for them.
- *Search:* Concerned loved ones anywhere search for the messages posted by those who self-registered.

To access the Safe and Well Website go to: www.disastersafe.redcross.org or call 1-866-GET-INFO.

Americans with Disabilities Act Working Group

This information is being provided to you via the ADA Working Group's Clearinghouse on Disability Information. We hope this information is helpful to you.

FLOOD SAFETY MEASURES

You can protect yourself from flood hazards by taking measures to ensure the safety of life and property before, during, and after a flood occurs.

Be prepared before a flood. Copy your most important documents and store originals in a safe place outside the home. Take photos of your most valuable possessions and store copies with other documents. Make an itemized list of other possessions. Store receipts for any expensive household items where they will not be destroyed.

Have an emergency plan. Provide your insurance agent, employer, and family with emergency contact information. Put aside an emergency kit equipped with a large flashlight, batteries, candles, waterproof matches and a battery operated radio. Keep a minimum 3-day supply of non-perishable food and water on hand. Visit www.disasterhelp.gov and www.ready.gov/index.html for more information.

Hurricane Supply Kit

At-Home Kit:

- ❑ 2 Flashlights
- ❑ A Battery Operated Radio
- ❑ Six Extra Sets of Batteries
- ❑ Gel Freezer Packs to Keep Food Cold
- ❑ A Cooler
- ❑ Candles, Matches and a Lighter
- ❑ A Tarp
- ❑ Towels (3 per person)
- ❑ Camera and Film (Video Camera and Blank Video)
- ❑ Kitchen utensils, spoons, knives, forks, hand – operated can opener, bottle opener, cooking pans, spatula, etc.
- ❑ A camping stove and/or grill with fuel, canned heat, and/or charcoal bricks and starter fluid
- ❑ Fire extinguisher (and a box of baking soda to extinguish a fire)
- ❑ If anyone in your family is taking prescription medicines, keep a two – week supply on hand
- ❑ A medicine kit with a first – aid book, a two – week supply of over-the-counter medicines: aspirins, stomach antacids, anti-diarrhea medicine, iodine, hydrogen peroxide, anti-bacterial ointment, bandages, insect repellent, scissors, tape, etc. *Check your first aid book for a list of important items.*
- ❑ A whistle
- ❑ A cell phone (if possible)
- ❑ Drinking water in plastic containers (minimum of one gallon of water per person per day for 14 days)
- ❑ A water purifying kit
- ❑ Non-perishable food in cans or sealed containers (enough for 14 days)
- ❑ A box of large, plastic trash bags
- ❑ A box of locking top, sealing plastic bags – one gallon size

Evacuation Kit:

- ❑ A map and compass
- ❑ A can of tire sealer in your trunk
- ❑ Sleeping bags and/or blankets for each member of your family
- ❑ Air or foam mattresses
- ❑ Identification for everyone
- ❑ Important Documents
- ❑ Extra clothes, shoes, etc.
- ❑ Books, games, playing cards, etc., (This may be an extended stay)
- ❑ Soap, shampoo, toothpaste, toothbrushes, deodorant, toilet paper, feminine products, and paper towels, etc.
- ❑ Cash

Use this information as a start to your own "Family Survival Plan."

Get the whole family involved in making your "Family Survival Plan". The kids will learn and enjoy the experience.

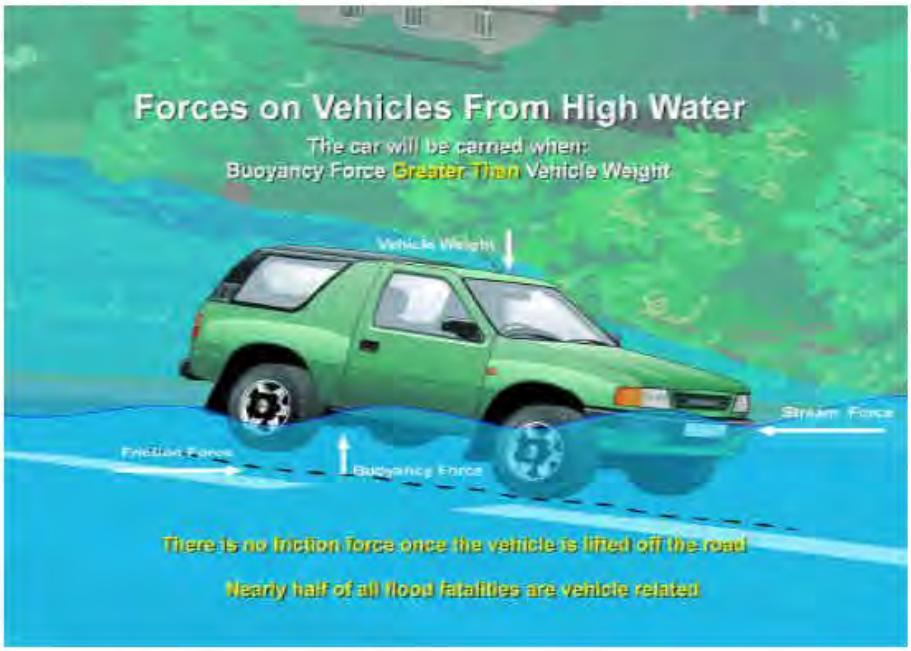
Don't forget to inform those people you have planned to stay with in case of an evacuation.

Stay informed. Turn on a battery operated radio or television to get the latest emergency information. Continue listening to the radio for news about what to do, where to go, and places to avoid.

If evacuation becomes necessary, do so immediately. Be sure that you turn off all utility services at the main connection.

Do not walk through flowing water. Drowning is the number one cause of flood deaths, mostly during flash floods. Currents can be deceptive; six inches of moving water can knock you off your feet. If you walk in standing water, use a pole or stick to see how deep the water is.

Do not drive through a flooded area. More people drown in their cars than anywhere else. Do not drive around road barriers; the road or bridges further down the road may be washed out. Two feet of moving water can sweep your car away. ***TURN AROUND DON'T DROWN***



Stay away from power lines and electrical wires. The number two flood killer after drowning is electrocution. Electric current can travel through water. Report downed power lines to your Power Company or County Emergency Operations Center at **386-758-1126**.

Be alert for gas leaks. Do not smoke or burn candles or lanterns. Gas is easily ignited. In a flood, be sure your gas is turned off by the gas company.

Look out for animals, especially snakes. Small animals may seek shelter in your home.

Don't leave pets behind. If you cannot take your pets with you please contact the Animal Shelter at **386-752-4702** to make arrangements for your pets.

FLOOD INSURANCE

In all 50 states...on coasts, mountains, along rivers, in the desert, in towns, and cities of every size....floods happen. Your home has a 26% chance of being damaged by a flood over the life of a 30-yr. mortgage.

For many people, their home and its contents represent their greatest investment. Property losses due to flooding are not covered under most standard homeowner's insurance policies. You can protect your home and its contents with flood insurance through the National Flood Insurance Program (NFIP.)

The NFIP is a federal program established by Congress in 1968 which enables property owners to buy flood insurance at reasonable rates in participating communities. In return, participating communities carry out flood management measures designed to protect life and property from future flooding.

The NFIP is administered by the Federal Emergency Management Agency through its Federal Insurance Administration. Columbia County has participated in the NFIP since 1996. The Columbia County NFIP community number is 120070.

Flood insurance from the NFIP puts you in control. You won't have to wait in line to apply for disaster assistance. Homeowners, business owners, and renters all can buy flood insurance, as long as their community participates in the NFIP.

Flood insurance claims are paid even if a disaster is not declared by the President. NFIP claims are paid promptly, so flood victims can recover quickly. If you file a flood insurance claim, you may request an advance partial payment for your immediate needs.

Flood insurance reimburses you for all covered losses. Homeowners can buy up to $250,000 of coverage. Separate contents coverage is available up to $100,000 for homeowner's and renters.

To find out more about flood insurance for your property and its contents, contact your insurance agent. There is usually a 30-day waiting period before a flood insurance policy takes effect, so don't wait until a storm threatens before you secure the flood insurance you need. For more information about the NFIP and flood insurance, call **1-800-427-4661**. To assess your risk, visit **www.floodsmart.gov**.

NATURAL AND BENEFICIAL FUNCTIONS OF THE FLOODPLAIN

These benefits take many forms:

1. Natural flood and erosion control---providing flood storage and conveyance, reduce flood velocity, controls erosion of beachfront or riverfront structures.
2. Water quality---filters nutrients and impurities from runoff.
3. Ground water recharge---reduces frequency and duration of surface flow.
4. Biological resources---supports high rate of plant growth, provides breeding and feeding grounds and enhances water fowl habitat.
5. Societal resources---provides open space and aesthetic pleasures, and in areas of scientific study, provides opportunities for environmental research.

COMMUNITY RATING SYSTEM

Columbia County participates in the Community Rating System (CRS), a part of the National Flood Insurance Program (NFIP), which provides a mechanism for reducing flood insurance premiums to reflect what a community does beyond the NFIP's minimum requirements. The CRS is a voluntary incentive program that rewards community actions that reduce flood risk through discounted flood insurance rates.

PROPERTY PROTECTION MEASURES

Every year, flooding causes more property damage in the United States than any other type of natural disaster. While recent construction practices and regulations have made new homes less prone to flooding, many existing structures remain susceptible. Throughout the country there is a growing interest from property owners to develop practical and cost effective methods for reducing or eliminating exposures to flooding. Several effective ways include acquisition and relocation of a building to a site not subject to flooding, construction of floodwalls or berms to keep water away from the property, or retrofitting structures to make them flood proof. Retrofitting is a different approach from the other ways because the property itself remains subject to flooding while the building is modified to prevent or minimize flooding of habitable space.

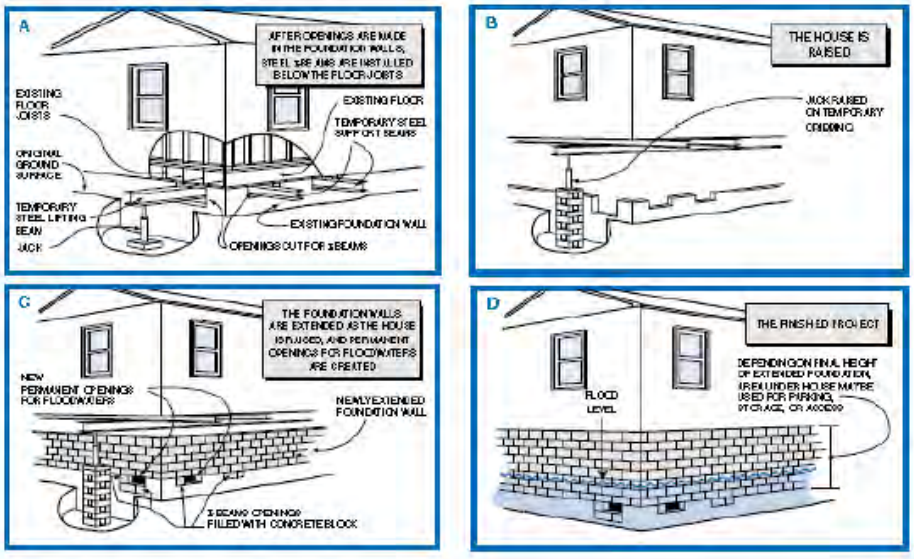
There are several recognizable approaches to retrofitting:

1. Elevation of the structure above flood protection levels.
2. Construction of barriers (floodwalls, berms.)
3. Dry flood proofing (water tight floor and wall systems.)
4. Wet flood proofing (permits entry and passage of flood waters.)

For example, this series of figures from the guide shows how a house on a basement crawlspace foundation can be elevated above the flood level on extended foundation walls.

In the event of pending flood threats it is always advisable to take the following emergency actions:

1. Sand bagging to reduce erosion and scouring.
2. Elevate furniture above flood protection levels.
3. Create floodway openings in non-habitable areas such as garage doors.
4. Seal off sewer lines to the dwelling to prevent the backflow of sewer waters.



FLOODPLAIN DEVELOPMENT PERMIT REQUIREMENTS

Any development in the floodplain requires a building permit according to Article 8 of Columbia County Land Development Regulations. To obtain a flood zone determination, contact the Columbia County Building and Zoning Department at **386-754-7053**, or online at **www.srwmdfloodreport.com**. Copies of Elevation Certificates for all buildings constructed in the floodplain since June, 2004 are available in the Building and Zoning Department. If you witness development that has not been permitted please contact Columbia County Code Enforcement at **(386)-719-2038.**

SUBSTANTIAL IMPROVEMENT REQUIREMENTS

Columbia County requires that if the cost of reconstruction, rehabilitation, addition, or other improvements to a building equals or exceeds 50% of the building's value, the building must meet the same construction requirements as a new building. Substantially damaged buildings must also be brought up to the same standards (e.g., a residence damaged where the cost of repairs equals or exceeds 50% of the building's value before it was damaged must be elevated above the base flood elevation.) The building's value shall be determined before the improvement is started, or if the structure has been damaged and is being restored, before the damage or destruction occurred.

DRAINAGE SYSTEM MAINTENANCE

A community can lose a portion of its drainage system carrying or storage capacity due to dumping, debris, soil erosion and sedimentation, and overgrowth of vegetation. When this happens, flooding occurs more frequently and reaches higher elevations, subjecting properties otherwise protected to unnecessary risk of damage. Keep grass clippings and other debris out of storm water drainage systems to prevent clogging and loss of storm water storage and treatment capacity.

If you experience or are aware of any localized drainage problems, including illegal stream dumping, please notify the Columbia County Road Department at **386-758-1019** so that the problem may be corrected.

AFTER THE FLOOD

Protect yourself and your family from the stress, fatigue, and health hazards that follow a flood:

1. Dry out your home. Floodwaters damage most materials and leave mud, silt and unknown contaminants that promote the growth of mold and mildew.
2. Restore the utilities. The rest of your work will be much easier if you have electricity, clean water, and sewage disposal.
3. Clean up. The walls, floors, closets, shelves, contents, and any other flooded parts of your home should be thoroughly washed and disinfected.
4. Rebuild and flood proof. Take your time to rebuild correctly and make improvements that will protect your building from damage by the next flood. Learn how to flood proof your home by elevating it above the flood level (BFE—Base Flood Elevation.)
5. Inquire about available funds to relocate. There are grant programs to mitigate structures in a flood prone area. www.fema.gov.
6. Purchase flood insurance if you don't already have it.

EVERYONE IS AT RISK. GET THE FACTS. BE FLOOD SMART.

Find out if you live in a flood prone area.
Ask whether your property is above or below the flood water level and learn about the history of flooding for your region.
Know before you buy.

National Flood Insurance Program

What is the National Flood Insurance Program (NFIP)?

The NFIP is a Federal program enabling property owners in participating communities purchase insurance protection against losses from flooding. This insurance is designed to provide an insurance alternative to disaster assistance to meet the escalating costs of repairing damage to buildings and their contents caused by floods.

Insurance Services Office NFIP/CRS

Participation in the NFIP is based on an agreement between local communities and the Federal Government that states if a community will adopt and enforce a floodplain management ordinance to reduce future flood risks to new construction in Special Flood Hazard Areas, the Federal Government will make flood insurance available within the community as a financial protection against flood losses.

Brought to you by the
Columbia County Building & Zoning Department
135 NE Hernando Ave., Suite B-21, Lake City, FL 32055
PH: 386-754-7053 PH: 386-758-1008 FX: 386-758-2160

COLUMBIA COUNTY COMPLETED LMS PROJECT LIST											
Jurisdiction	General Location	Action Name	Action Type	Hazard Mitigated	Scope of Work	Agency Responsible	Estimated Cost	Priority	Funding Source	Status Completed	Mitigate new or existing? (N/E)
Columbia County	West Lake City	Emergency Operations Center Expansion	Emergency Response Enhancement	All	Expand the County Emergency Operations Center.	**BCC**	$500,000	2	Local; EMPG	**X**	**E**
Columbia County	Countywide	Additional EOC Damage Assessment Staff	Emergency Response Enhancement	All	Recruitment and training of additional Emergency Operations Center Damage Assessment Staff.	**BCC**	TBD	4	DHS; EM program funding	**X**	**N/A**
Columbia County	Countywide	School Core Area Sheltering	Emergency Shelter Enhancement	All	Encouragement the school district to, when building new schools, install backup generators and hurricane shutters.	**BCC**	TBD	5	local; HMGP and State funds	**X**	**N**
Columbia County	Fort White	Emergency Shelter Retrofit - Fort White High School	Emergency Shelter Retrofit	All	Install hurricane shutters on high school cafeteria building.	**BCC**	$40,000	10	HMGP	**X**	**E**
Columbia County	Fort White	Emergency Shelter Retrofit - Columbia City Elementary School	Emergency Shelter Retrofit	All	Install hurricane shutters and backup electrical generator.	**BCC**	$60,000	11	HMGP	**X**	**E**
Columbia County Fort White Lake City	Not Applicable	Annual Pew-Hurricane Season Elected Officials Meeting	Meeting	Hurricanes and Coastal Storms	An annual pre-hurricane season meeting with elected officials and department heads to familiarized important decision makers with emergency operations and procedures during and immediately after hurricane events.	**BCC**	$1,000	12	Emergency Management Program Funding	**X**	**N/A**
Columbia County Fort White Lake City	Countywide	Comprehensive Plan Maintenance	Riverine Setbacks	Hurricanes and Coastal Storms, Flooding, Coastal and Riverine Erosion	Maintain current local government comprehensive plan requirements for 75-foot natural vegetated buffers from the Icaetucknee and Suwannee Rivers: 50-foot natural vegetative buffers from all other perennial rivers, streams and creeks.	**Building & Zoning**	$2,500	13	Local and County matching funds	**X**	**N/E**
Columbia County	Countywide	FEMA FIRM Map Updates	Comprehensive Plan Evaluation	Hurricanes and Coastal Storms, Flooding	Amend County Comprehensive Plan to include updated Federal Emergency Management Agency Flood Insurance Rate Maps when available.	**Zoning**	$5,000	15	Local and County matching funds	**X**	**N/E**
Columbia County Fort White Lake City	Countywide	REMA FIRM 1-foot Elevation	Long-term Mitigation	Hurricanes and Coastal Storms, Flooding	Continue local government participation in the Federal Emergency Management Agency National Flood Insurance Program and require all habitable structures built within the 100-year flood prone areas be elevated no lower than 1-foot above the base flood elevation.	**Building & Zoning**	$5,000	16	Local and County matching funds	**X**	**N/E**
Columbia County Fort White	Countywide	Comprehensive Plan Maintenance - 100-year Floodplains	Comprehensive Plan Evaluation	Hurricanes and Coastal Storms, Flooding	Maintain local government comprehensive plan policies which limit the allowable use and intensity of use of lands within the 100-year flood plains of the Icaetucknee and Suwannee Rivers as Environmental Sensitve on the future Land Use Plan Map.	**Zoning**	$2,500	17	Local and County matching funds	**X**	**N/E**
Columbia County Fort White Lake City	Countywide	Stormwater Utility	Drainage Improvements	Hurricanes and Coastal Storms, Thunderstorms, Flooding	Implement a stormwater utility.	**BCC and SRWMD**	TBD	19	Stimulus funds	**X**	**N/E**
Columbia County	Countywide	Comprehensive Plan Floodable Areas	Comprehensive Plan Evaluation	Hurricanes and Coastal Storms, Flooding	Development special overlay districts with higher development standards in areas located outside FEMA firms. Map 100-year flood plains which are known to have been flooded during the 2004 hurricanes.	**Zoning**	$10,000	20	Local and County matching funds	**X**	**N/A**
Columbia County Fort White Lake City	Countywide	Public Education Program - Disaster Prevention	Public Education	All	Update County website to include an education program for homeowners and businesses regarding disaster prevention and mitigation.	**Building & Zoning**	$15,000	26	DHS	**X**	**N/A**
Columbia County	Countywide	Records Maintenance - News Events	Records Maintenance	All	Maintain a historical record of natural disasters and disaster-related news events to assist in documenting natural hazards. Maintain a geographic information system-based inventory of repetitive loss structures.	**BCC**	$15,000	37	Local and County matching funds	**X**	**N/A**
Columbia County Fort White Lake City	Countywide	First Responder Hazardous Materials Training	Personnel Training	All	Conduct hazardous materials training programs for first respondents and operational level personnel.	**BCC**	$5,000	38	DHS;EMPA	**X**	**N/A**
Columbia County Fort White Lake City	Countywide	Digital FEMA FIRM Maps	Floodplain Management	Hurricanes and Coastal Storms, Flooding	Incorporate into local flood[plain mitigation programs all updated and digitalized Federal Emergency Management Agency floodplain maps as they become available as a result of a Federal Emergency Management Agency Flood Map Modernization Program.	**Zoning**	$2,500	40	fema map-mod;	**X**	**N/A**

COLUMBIA COUNTY COMPLETED LMS PROJECT LIST											
Jurisdiction	General Location	Action Name	Action Type	Hazard Mitigated	Scope of Work	Agency Responsible	Estimated Cost	Priority	Funding Source	Status Completed	Mitigate new or existing? (N/E)
Columbia County	C.R. 242	Burnett Circle	Drainage Improvements	Hurricanes and Coastal Storms, Thunderstorms, Flooding	Installation of larger culverts and repair shoulders of road with riprap.	**CC Public Works**	$43,900	60	stimulus and local fudning	**X**	**E**
Columbia County	SE Columbia County	Mixon Road Improvements	Drainage Improvements	Hurricanes and Coastal Storms, Flooding	Make road improvements to prevent a portion of this road from regularly washing out during floods.	**CC Public Works**	TBD	64	stimulus and local fudning	**X**	**E**
Columbia County Fort White Lake City	Countywide	Repetitive Loss Resident Buyouts	Retrofit	Hurricanes and Coastal Storms, Thunderstorms, Flooding	Reduce or eliminate the long term risk of flood damage to residences with repetitive losses by retrofitting and/or elevating structures.	**Building & Zoning**	TBD	71	FMA, SRL, HMGP	**X**	**E**
Columbia County	Mason City	James Feagle Road Buckley Road	Road and Drainage Improvement	Hurricanes and Coastal Storms, Thunderstorms, Flooding	Road elevation and installation of culverts.	**Public Works**	$23,000	75	stimulus and local fudning	**X**	**E**
Columbia County	Countywide	Firewise Design Principles	Public Education	Wildfire	Work with the Florida Division of Forestry to inform the public of Firewise building and landscape design principles.	**BCC**	$1,000	79	FDOF;	**X**	**N/A**
Columbia County Fort White Lake City	Countywide	Firewise Design Principles	Enforcement	Wildfire, Drought/Heatwave	Maintain local laws which allow local government to enact burn bans during periods of drought.	**BCC**	$2,500	80	FDOF;	**X**	**N/A**
Columbia County	Fort White	Emergency Shelter Retrofit - Columbia City Elementary School	Emergency Shelter Retrofit	All	Install hurricane shutters and backup electrical generator.	**Emergency Management**	$60,000	10	Local funding	**X**	**E**

COLUMBIA COUNTY DELETED LMS PROJECT LIST												
Jurisdiction	**General Location**	**Action Name**	**Action Type**	**Hazard Mitigated**	**Scope of Work**	**Agency Responsible**	**Estimated Cost**	**Priority**	**Funding Source**	**Deleted**	**Mitigate new or existing?**	**Timeframe for Completion**
Columbia County	Jones	Jones Terrace Drainage Improvements	Drainage Improvements	Hurricanes and Tropical Storms, Thunderstorms, Flooding	Replace existing drainage system with larger culverts and riprap shoulders.		$100,000	21	HMGP; FMA;	X	N/A	N/A
Columbia County	Countywide	Full-time Emergency Management Planner	Personnel	All	Evaluate the feasibility of bringing a full-time emergency management planner to assist in maintaining the Local Mitigation Strategy, maintaining the Comprehensive Emergency Management Plan, applying for Federal Emergency Management Agency grants and other natural-disaster planning activities	**BCC**	$100,000	23	Local and County matching funds; EMPA	X	N/A	N/A
Columbia County	Route 8, Box 276, Lake City	Five Points Elementary School	Shelter Retrofitting	All	Install backup electrical generator and automatic power transfer switch with 200 amp emergency panel for necessary emergency lighting and equipment circuits. Replace 168 square feet of existing windows with hurricane windows and shutters. Replace three sets of doors on 2,256 square foot dining area.	**BCC/CCSB**	$76,700	28	local and county matching funds; HMGP	X	N/A	N/A
Columbia County	2688 McFarlane Avenue	Summers Elementary School	Shelter Retrofitting	All	Install backup electrical generator and automatic power transfer switch with 200 amp emergency panel for necessary emergency lighting and equipment circuits. Replace 315 square feet of existing windows with hurricane windows and shutters. Replace three sets of doors on 4,486 square foot dining area.	**BCC/CCSB**	$95,500	29	Local funding	X	N/A	N/A
Columbia County	225 Defender Avenue	Eastside Elementary School	Shelter Retrofitting	Hurricanes and Tropical Storms, Thunderstorms, Tornadoes and Downbursts	Install backup electrical generator and automatic power transfer switch with 200 amp emergency panel for necessary emergency lighting and equipment circuits. Replace 168 square feet of existing windows with hurricane windows and shutters. Replace three sets of doors on 2,256 square foot dining area.	**BCC/CCSB**	$118,100	30	Local funding	X	N/A	N/A
Columbia County	500 E Putnam Street	Melrose Elementary School	Shelter Retrofitting		Install backup electrical generator and automatic power transfer switch 200 amp emergency panel for necessary emergency lighting and equipment circuits. Replace 452 square feet of existing windows with hurricane windows and shutters. Replace two sets of doors on 3,161 square foot dining area.	**BCC/CCSB**	TBD	31	Local funding	X	N/A	N/A
Columbia County Fort White Lake City	Countywide	Underground Utilities - Existing Buildings	Hurricane Retrofitting	Hurricanes and Tropical Storms, Tornadoes and Downbursts	Consider working with local cable, electrical and telephone utilities to place utility lines underground in existing urban areas.	**BCC**	TBD	39	CIE; Local and County matching funds	X	N/A	N/A
Columbia County	Azalea Park	Pollard	Drainage Improvements	Hurricanes and Tropical Storms, Thunderstorms, Flooding	Installation of pumping station for surface water.	**CC Public Works**	$20,700	59	stimulus and local funding	X	N/A	N/A
Columbia County	Peacock Road	Brandon Circle	Drainage Improvements	Hurricanes and Tropical Storms, Thunderstorms, Flooding	Replace existing drainage system - concrete drainage ditch to retention pond.	**CC Public Works**	$143,800	61	stimulus and local funding	X	N/A	N/A

COLUMBIA COUNTY DELETED LMS PROJECT LIST												
Jurisdiction	**General Location**	**Action Name**	**Action Type**	**Hazard Mitigated**	**Scope of Work**	**Agency Responsible**	**Estimated Cost**	**Priority**	**Funding Source**	**Deleted**	**Mitigate new or existing?**	**Timeframe for Completion**
Columbia County Fort White Lake City	Countywide	Railroad Overpass Feasibility Study	Engineering Study	All	Consider a feasibility study of railroad overpasses to alleviate delays to emergency vehicles.	**BCC**	TBD	78	HMGP; FHA;	**X**	**N/A**	**N/A**
Columbia County Fort White Lake City	Countywide	Warning Shelters	Temporary Sheltering	Winter Storms/Freezes	Open public warming shelters when temperature drop to 35 degrees.		$5,000	84	Local funding	**X**	**N/A**	**N/A**

COLUMBIA COUNTY NEW/ONGOING/DEFERRED LMS PROJECT LIST

Jurisdiction	General Location	Action Name	Action Type	Hazard Mitigated	Scope of Work	Agency Responsible	Estimated Cost	Priority	Funding Source	Status				Notes	Mitigate new or existing?	Timeframe for Completion
										New	Ongoing	Deferred	If deferred, why?			
Columbia County; Town of Ft. White; City of Lake City	Countywide	Residential Retrofits	Retrofit of existing structures	Wind	Develop and implement a residential retrofit program to address the needs identified in the graded inventory and accompanying analysis completed June 2011.	Emergency Management	$150,000	1	RCMP		x			Th County may wait to apply for these funds	E	1 year
Columbia County; Town of Ft. White; City of Lake City	Countywide	Training, Outreach, Exercising, Partnership Building	Training, Outreach, Exercising, Partnership Building	All, emphasis on wind	Columbia County is exploring the implementation of training programs for building officials and those who may run the residential retrofit program. Additionally, this project may include partnership development and a data sharing portal.	Emergency Management	$150,000	2	RCMP		x				N/E	1 year
Columbia County	Countywide	Communications Upgrades	Emergency Response Enhancement	All	New radio repeaters for primary and secondary radio channels, including backup electrical generators.	**BCC**	1.8 million dollars	3	Local		X				N/E	In Progress/end of year for completion
Columbia County	Countywide	CWPP	Education	Wildfire	Work with the Florida Forest Service to develop the Community Wildfire Protection Plan	Emergency Management	n/a	4		x						within 1 year
Lake City	750 East Margarets Road	Lake City Waste Water Treatment Plant	Critical Facility Retrofitting	Hurricanes and Coastal Storms, Tornadoes and Downbursts	Acquisition of 2 backup electrical generators.	City of Lake City	$96,600	5	City funding		X				E	6 months
	Countywide	Hazard Outreach Campaign	Education & Outreach	All	Columbia County Emergency Management office will conduct a series of outreach meetings/workshops intended to educate the general public regarding all the hazards identified in the LMS. Marketing materials will include rack cards, one-page flyers developed through their office, as well as other materials available through organziations such as FLASH. In the past they have reached out to Kiwanis, Seniors United, the fair and a variety of local schools.	CCEM	$2,000	6	EMPA, DHS		x				N/E	2 year
Columbia County	Countywide	Volunteer Fire Department/Emergency Medial Services Facilities Retrofit	Emergency Services	All	Columbia County Volunteer Fire Department/Emergency Management Services Retrofit. Install backup electrical generators with automatic switches at all 9 County fire departments and emergency medical service stations.	BCC	$180,000	7	Local funding		X			90% complete	E	6 months
Columbia County	Old Country Club Road	Olustiee Street	Drainage Improvements	Hurricanes and Coastal Storms, Thunderstorms, Flooding	Drainage survey, design and construction plans for stormwater drainage system.	BCC	$287,500	8	Stimulus funds		X				E	In progress/ apx. 1 year to completion
Lake City	North Lake City	Washington Street Area Sewer Manholes	Drainage Improvements	Hurricanes and Coastal Storms, Thunderstorms, Flooding	Replace 12 deteriorated sewer manholes with new manholes.	City of Lake City	$85,000	9	Water protection & flood prevention;		X				E	1 year
Lake City	NE Lake City	Gibbs Street Area Sanitary Sewer Lift Station	Emergency Study and WWTP Floodproofing Enhancements	Hurricanes and Coastal Storms, Thunderstorms, Flooding	Perform engineering study and implement necessary measures to floodproof existing sanitary sewer lift stations.	City of Lake City	$85,000	10	HMGP; FMA;		X				E	1 year
Columbia County	Countywide	Repetitive Loss Resident Buyouts	Public Acquisition	Hurricanes and Coastal Storms, Flooding	Acquisition and removal of 20 residences subject to repetitive loss damages.	BCC	$5,000,000	11	HMGP; FMA; CDBG; SRL; RFC; FCT		X			Portion complete--this is an on-going process	E	The last HMGP took 5 years
Lake City	NW Section Lake City	Gwen Lake Drainage Basin: Shelby Terrace	Stormwater Management	Hurricanes and Coastal Storms, Thunderstorms, Flooding	Lake City Northwest Lake City Area. Gwen Lake Drainage Basin: Shelby Terrace. Replace Gwen Lake dam and adjoining Shelby Drive outflow bridge.	City of Lake City	$150,000	12	Stimulus/local funds		X			Working on Glen Lake now	N/E	3 years
Columbia County Fort White Lake City	Countywide	Comprehensive Plan Evaluation	Comprehensive Plan Evaluation	All	Evaluate County and municipal local government comprehensive plans for consistency with the Local Mitigation Strategy and amend the local government comprehensive plans to improve long-term mitigation of natural hazards, with a special emphasis on existing and future buildings and infrastructure.	Zoning & BCC	$2,500	13	Local and County matching funds		X					1 year
Lake City	NE Division Lake City	Fronie St. Jackson St. Aberdeen St. C.R. 100-a	Stormwater Management	Hurricanes and Coastal Storms, Thunderstorms, Flooding	Drainage improvement, stormwater retention, buyouts of retention and buyout of 3 homes.	City of Lake City	$82,800	14	HMGP; FMA: Watershed Protection & Flood Prevention		X				N/E	1 year

COLUMBIA COUNTY NEW/ONGOING/DEFERRED LMS PROJECT LIST																
Jurisdiction	General Location	Action Name	Action Type	Hazard Mitigated	Scope of Work	Agency Responsible	Estimated Cost	Priority	Funding Source	Status				Notes	Mitigate new or existing?	Timeframe for Completion
										New	Ongoing	Deferred	If deferred, why?			
Lake City	SW Section Lake City	McFarlane Ave Grandview St. St. Margerets Road Lake Montgomery Outfall Alamo Rive U.S. 441/S. Marion Street	Stormwater Management (Water Management District is currently conducting a stormwater management study on this	Hurricanes and Coastal Storms, Thunderstorms, Flooding	Drainage improvement, floodway improvement, repair, silt and debris removal 900 foot ditch (additional improvements may be identified by the Water Management District Stormwater Management Study).	City of Lake City	TBD	15	HMGP; FMA: Watershed Protection & Flood Prevention		X				N/E	1 year
Lake City	NEW Section Lake City	Gwen Lake Drainage Basin: Ashley St. Duval Street Ridgewood Drive Palm Circle Area	Stormwater Management	Hurricanes and Coastal Storms, Thunderstorms, Coastal and Riverine Erosion, Flooding	Drainage Improvement, Silt and Debris Removal, Erosion Control, Street Repair and Ditch Repair.	City of Lake City	$29,000	16	HMGP; FMA: Watershed Protection & Flood Prevention		X				N/E	1 year
Lake City	SW Section Bays/7th St. Area	Drainage into Lake Montgomery (7th Street/City Park)	Stormwater Management	Hurricanes and Coastal Storms, Flooding	Drainage improvement, silt and debris removal.	City of Lake City	TBD	17	HMGP; FMA: Watershed Protection & Flood Prevention		X				E	1 year
Lake City	SW Section El Prado Street	Drainage from S. First Street to Lake Montgomery	Stormwater Management	Hurricanes and Coastal Storms, Flooding	Drainage improvement, secure easements, buy right-of-way for maintenance.	City of Lake City	TBD	18	HMGP; FMA: Watershed Protection & Flood Prevention		X				E	1 year
Lake City	SW Section Lake City, Grandview and Troy Road	Quail Ridge Subdivision Area Drainage	Stormwater Management	Hurricanes and Coastal Storms, Thunderstorms, Flooding	Ditch repair, road improvements, stormwater runoff (pending completion of Suwannee River Water Management District Study).	City of Lake City	TBD	19	HMGP; FMA: Watershed Protection & Flood Prevention		X				N/E	1 year
Lake City	SW Section Lake City	Drainage Retrofit Wall Avenue Poplar Street Spring Street Ball Avenue	Drainage Improvements	Hurricanes and Coastal Storms, Thunderstorms, Flooding	Drainage retrofit to alleviate localized flooding of residences and keeping roads possible.	City of Lake City	$150,000	20	HMGP; FMA: Watershed Protection & Flood Prevention		X				E	1 year
Lake City	Central Business District	Downtown Area Lake City	Stormwater Management	Hurricanes and Coastal Storms, Thunderstorms, Flooding	Storm system replacement.		TBD	21	HMGP, FMA, Watershed Protection & Flood Prevention; Local and County matching funds		X				E	up to 24 months
Columbia County Fort White Lake City	Countywide	Comprehensive Plan High Aquifer Recharge	Comprehensive Plan Evaluation	Hurricanes and Coastal Storms, Thunderstorms, Flooding	Maintain local government comprehensive plan policies which limit to low-density and non-intensive use in high aquifer recharge areas in order to maintain high rates of water recharge.	Zoning	$2,500	22	Local and County matching funds		X			This will be done on an yearly basis	N/E	1 year
Columbia County Fort White Lake City	Countywide	Comprehensive Plan Water Conservation	Comprehensive Plan Evaluation	Hurricanes and Coastal Storms, Thunderstorms, Flooding	Maintain local government comprehensive plan policies which support compliance with water conservation programs and emergency water conservation efforts established by the Suwanee River Water Management District.	Zoning	$2,500	23	Local and County matching funds		X			This will be done on an yearly basis	N/E	1year
Columbia County Fort White Lake City	Countywide	Minimum Housing Codes	Enforcement	All	Maintain local government minimum housing codes which establish minimum performance standards for dwelling units.	Code Enforcement & Building & Zoning	$5,000	24	Local and County matching funds		X			This will be done on an yearly basis	E	1 year
Lake City	LCFlorida Gateway Community College Main Campus 149SE College Place Lake City Florida	Place primary electrical distribution underground	mitigate storm damage to electrical grid	Hurricanes and Coastal Storms, Tornadoes and Downbursts	As funds are available place existing highline distribution system underground, most critical sections first.	LCCC	Next leg in center of campus est. ~$350,000	25	Public education capital Outlay fund		x			80% complete	E	

COLUMBIA COUNTY NEW/ONGOING/DEFERRED LMS PROJECT LIST																
										Status						
Jurisdiction	General Location	Action Name	Action Type	Hazard Mitigated	Scope of Work	Agency Responsible	Estimated Cost	Priority	Funding Source	New	Ongoing	Deferred	If deferred, why?	Notes	Mitigate new or existing?	Timeframe for Completion
School Board		Richardson Middle School, Lake City Middle School and Summers Elementary Shelter Retrofitting	Emergency Shelter Retrofitting	All	Install backup electrical generator and automatic power transfer switch with 200 amp emergency panel for necessary emergency lighting and equipment circuits. Install windows Replace doors	**BCC/CCSB**	$390,000	26	HMGP, CIE		x				E	6 months
Columbia County Fort White Lake City	Countywide	Sinkhole Maps	Comprehensive Plan Evaluation	Sinkholes	Identify locations of known sinkholes and sinkhole prone areas and include maps of such areas in local government comprehensive plans. Include mapped locations in County geographic information system	**Zoning & BCC**	$5,000	27	Local and County matching funds		x			Underway	N/A	1 year
Columbia County Fort White Lake City	Countywide	Residential Hurricane Shutters	Comprehensive Plan Evaluation	Hurricanes and Coastal Storms, Tornadoes and Downbursts	Consider amendments to local government comprehensive plans to provide density bonuses and other incentives to encourage the placement of hurricane shutters on buildings.	**Zoning & BCC**	$5,000	28	RCMP; Local and County matching funds			X	Waiting for funding		N/A	1 year
Columbia County Fort White Lake City	Countywide	Underground Utilities - New Residences	Comprehensive Plan Evaluation	Hurricanes and Coastal Storms, Tornadoes and Downburts	Consider amendments to local government comprehensive plans and land development regulations to require underground cable, electrical and telephone lines in new residential subdivisions.	**Zoning & BCC**	$5,000	29	RCMP; Local and County matching funds		x		Ordinance	Draft language complete	N	6 months
Columbia County	Santa Fe, Suwanne and Ichetucknee Rivers	Comprehensive Plan Floodplain Restrictions	Comprehensive Plan Evaluation	Hurricanes and Coastal Storms, Flooding	Consider amending the County Comprehensive Plan to increase from 1 foot to 2 feet the minimum height above the 100-year flood elevation required for the first floor of all structures.	**Zoning & BCC**	$5,000	30	RCMP; Local and County matching funds		x		Ordinance	50% completed	N/E	6 months
Columbia County	Suwannee Valley	River Road Booker T. Combs Tiger Drain Nova Road, California Road, Central Blvd, Hartford Road, Old Bellamy, Hall Road, Riverville Road, Falkner Road, Pounds Hammock Road, Horne Road, High Falls Road, James Croft, Robert Cox, Arrowhead Road, Tuskeneggee Road, Pinemount Road, Double Run, Hunt Road, Bell Road, Blackjack Road, Dicks Road, Jeffia Allen Road, Perry Road, Murray Road	Floodway Study and Floodway Impediment Removal	Hurricanes and Coastal Storms, Flooding	Engineering study needed to update the Federal Emergency Management Agency, Flood Insurance Rate Map.	**Zoning & Public Works**	TBD	31	HMGP; FMA: Watershed Protection & Flood Prevention			x	Waiting for funding		N/E	1 year
Columbia County	Countywide	Retention Ponds Study	Engineering Study and Drainage Improvements	Hurricanes and Coastal Storms, Thunderstorms, Flooding	Study existing retention ponds to determine if enlargement would reduce flooding of nearby buildings.	**CC Public Works**	TBD	32	HMGP; FMA: Watershed Protection & Flood Prevention			X	Waiting for funding		N/E	1 year
Columbia County	SW Section	Cris Street Area Floodway Study	Engineering Study	Hurricanes and Coastal Storms, Flooding	Conduct an engineering study on flood area. (Property acquisition)	**Zoning**	TBD	33	HMGP		x			Underway	N/A	2015
Columbia County	Santa Fe/O'Leno	Bible Camp Road	Roadway and drainage improvements	Hurricanes and Coastal Storms, Thunderstorms, Flooding	Installation of larger culverts, repair shoulders of road with riprap and installation of guardrails. (two boat ramps and road)	**Public Works**	$78,200	34	FWC		x			Underway	E	6 months

COLUMBIA COUNTY NEW/ONGOING/DEFERRED LMS PROJECT LIST																
Jurisdiction	General Location	Action Name	Action Type	Hazard Mitigated	Scope of Work	Agency Responsible	Estimated Cost	Priority	Funding Source	Status				Notes	Mitigate new or existing?	Timeframe for Completion
										New	Ongoing	Deferred	If deferred, why?			
Columbia County	Country Club Road	Cherokee Avenue Retention Pond	Silt and debris removal	Hurricanes and Coastal Storms, Thunderstorms, Flooding	Dredge retention pond of silt of debris.	**Public Works**	$28,800	35	Grants and other funding sources to be determined as funds become available			x	Waiting for funding	County pumping station installed	E	6 months
Columbia County	Countywide	Comprehensive Plan Sinkholes	Comprehensive Plan Evaluation	Sinkholes	Consider amendments to local government comprehensive plans to provide a minimum natural vegetated buffer from known sinkholes to prevent damage to future structures.	**Zoning & BCC**	$5,000	36	RCMP; Local and County matching funds			x	Waiting for funding		N	6 months
Columbia County Fort White Lake City	Countywide	Tornado Mitigation	Comprehensive Plan Evaluation	Tornadoes and Downbursts	Consider amendments to local government comprehensive plans which provide density bonuses or other incentives to encourage the construction of tornado safe rooms in habitable buildings.	**Zoning**	$5,000	37	RCMP; Local and County matching funds			X	Considered a low priority due to lack of available funding.		E	8 months
Columbia County Fort White Lake City	Countywide	Tornado Mitigation	Comprehensive Plan Evaluation	Tornadoes and Downbursts	Consider amendments to local comprehensive plans which provide density bonuses or other incentives to encourage the construction of tornado safe shelters in mobile home parks to be used by mobile home park residents during periods of tornado emergencies	**Zoning**	$5,000	38	RCMP; Local and County matching funds			X	Considered a low priority due to lack of available funding.		N/E	8 months