POLK
COUNTY

2020
Multi-jurisdictional
Local Mitigation Strategy

PREPARED BY
THE POLK COUNTY LOCAL MITIGATION STRATEGY WORKING GROUP

August 4, 2020

ADA VERSION

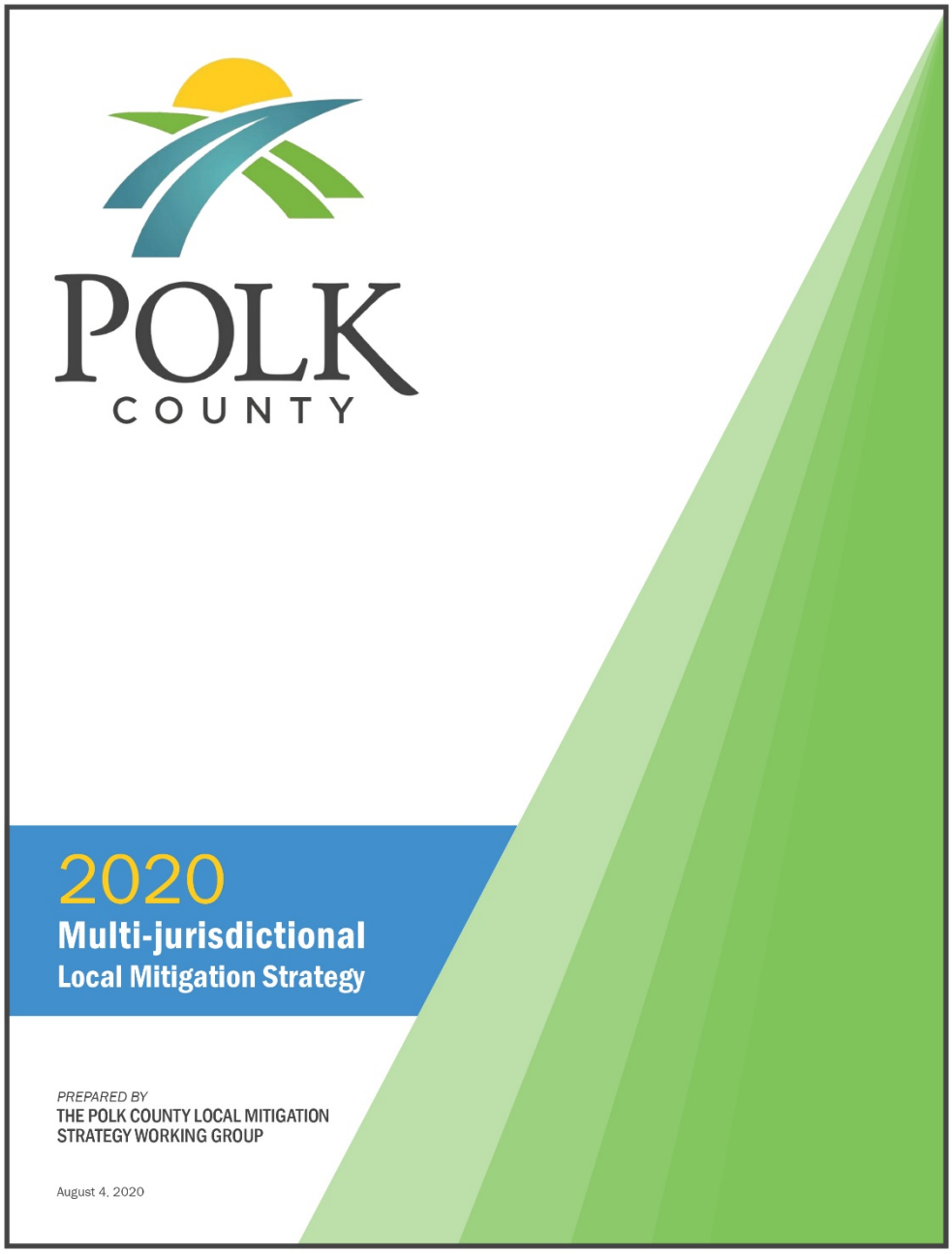
PROMULGATION STATEMENT

With this notice, we are pleased to promulgate the Polk County 2020 Multi-Jurisdictional Local Mitigation Strategy (LMS). The LMS provides a structure for identifying hazards and vulnerabilities, assisting jurisdictions and partners and the County to plan for those hazards and vulnerabilities, and mitigating hazards using local, State, and Federal funding sources, making Polk County more resilient.

The Polk County Division of Emergency Management shall be responsible for coordinating the preparation and update of the LMS through the LMS Working Group and subgroups, and will ensure that this document is consistent with similar Federal, State, and municipal plans. The LMS will become effective upon official adoption by the Polk County Board of County Commissioners (BoCC), and effective for municipalities, Polk County Public Schools, and partnering jurisdictions upon their individual adoption.

Greg Becker
Chairperson
Local Mitigation Strategy Working Group

Paul Womble
Director
Division of Emergency Management



Document prepared with technical assistance from:

Central Florida Regional Planning Council

STATE OF FLORIDA

DIVISION OF EMERGENCY MANAGEMENT

Ron DeSantis
Governor

Jared Moskowitz
Director

June 10, 2020

Paul Womble, Director
Polk County Emergency Management
1890 Jim Keene Blvd.
Winter Haven, FL 33880

Re: Polk County Local Hazard Mitigation Plan Approved Pending Adoption

Dear Director Womble,

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

Polk County, Unincorporated
Polk County School Board
City of Auburndale
City of Bartow
City of Davenport
Town of Dundee
City of Eagle Lake
City of Fort Meade
City of Frostproof
City of Haines City
City of Mulberry
City of Polk City
City of Winter Haven
Village of Highland Park
Town of Hillcrest Heights
City of Lake Alfred
Town of Hamilton
City of Lake Wales
City of Lakeland

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

If you have any questions regarding this matter, please contact your LMS Liaison Dan Curcio at Daniel.Curcio@em.myflorida.com or 850-815-4504.

Respectfully,

Miles E. Anderson

Digitally signed by Miles E. Anderson
DN: cn=Miles E. Anderson, o=DEM, ou=Mitigation, email=Miles.anderson@em.myflorida.com, c=US
Date: 2020.06.10 10:50:51 -04'00'

Miles E. Anderson,
Bureau Chief, Mitigation
State Hazard Mitigation Officer

MEA/dc

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

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

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EXECUTIVE SUMMARY

Polk County, its jurisdictions, and partners face natural and human-caused hazards that may affect the lives and property of residents and visitors. The Polk County 2020 Multi-Jurisdictional Local Mitigation Strategy (LMS) is a mechanism for the County and its jurisdictions to reduce or eliminate exposure to impacts of hazards. The 2020 update of the LMS is a result of a coordinated, cooperative effort within Polk County.

The LMS Working Group identified and prioritized project-planning goals for the LMS following the completion of an updated hazard identification and risk assessment. With the updated analysis, the LMS Working Group identified, justified, and prioritized proposals for projects and programs that may avoid or minimize vulnerabilities in the future, resulting in a Mitigation Action Plan (MAP) for the County.

The LMS Working Group has submitted the LMS to the Florida Division of Emergency Management (FDEM) for review and approval. FDEM has the authority to review the LMS on behalf of the Federal Emergency Management Agency (FEMA). FDEM utilizes the Local Hazard Mitigation Plan Review Tool, which includes the 2020 Florida Local Mitigation Strategy Crosswalk to review the LMS. Appendix D includes Polk County's 2020 LMS Crosswalk.

Once FDEM issues a decision that the updated LMS adequately addresses these requirements, the LMS Working Group will vote to adopt the LMS and submit the LMS to the jurisdictions' governing bodies for formal adoption and approval. Appendix H of the LMS includes the adoption resolutions from each jurisdiction. The governing bodies of the jurisdictions will consider the final draft LMS for final approval and adoption. Consistent with Florida's open meetings statutes, the public will have an opportunity to comment on each jurisdiction's adoption of the LMS during public meetings. In accordance with Federal practice, the jurisdictions have one year from the date of State approval of the LMS to complete the formal adoption. The following jurisdictions may adopt the final draft of the LMS.

- Polk County
- Polk County Public Schools
- City of Auburndale
- City of Bartow
- City of Davenport
- Town of Dundee
- City of Eagle Lake
- City of Fort Meade
- City of Frostproof
- City of Haines City
- Village of Highland Park
- Town of Hillcrest Heights
- Town of Lake Alfred
- Town of Lake Hamilton
- City of Lake Wales
- City of Lakeland
- City of Mulberry
- City of Polk City
- City of Winter Haven

The LMS Working Group completed the update with the assistance of County staff and Central Florida Regional Planning Council staff. The LMS includes the best available information at the time the document was prepared. As new information becomes available, the LMS Working Group intends to provide ongoing updates to ensure this document remains current.

SECTION I - INTRODUCTION

The Federal Emergency Management Agency (FEMA) defines mitigation as "Any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards". Hazard mitigation focuses attention and resources on community policies and actions to produce cumulative benefits over time. A mitigation plan states the goals and actions a community intends to follow to reduce vulnerability and exposure to future hazard events. A systematic process centered on participation of residents, businesses, public officials, and other community stakeholders is the basis of the Polk County 2020 Multi-Jurisdictional Local Mitigation Strategy (LMS).

A local mitigation plan is the written representation of a jurisdiction's commitment to reduce risks from hazards. Local officials may refer to the plan in day-to-day activities and decisions regarding regulations, permitting, and funding capital improvements and other community initiatives. The local mitigation plan serves as the basis for the State to prioritize future grant funding as it becomes available.

Community stakeholders may utilize the LMS as a tool to increase public awareness about local hazards and risks while providing options and resources available to reduce those risks. Teaching the public about potential hazards will help each jurisdiction protect itself against the impacts of hazards and will enable informed decision making on where to live, purchase property, or locate businesses.

Background

Natural hazards such as hurricanes, floods, and tornadoes are a part of the world around us. Their occurrences are natural and inevitable. The LMS considers hazards as significant threats to human life, safety, and property.

Polk County, located in central Florida, is vulnerable to a wide range of natural hazards, including hurricanes, severe thunderstorms, flooding, tornadoes, and wildfires. The County is also vulnerable to human-caused hazards including cyber-attacks, hazardous material spills, and civil disturbances. These hazards threaten the life and safety of residents and have the potential to damage or destroy both public and private property, disrupt the local economy, and affect the overall quality of life of individuals who live, work, and visit in the community. While jurisdictions cannot eliminate natural hazards, they can take actions to lessen the potential impacts on the community.

FEMA Definition of Hazard Mitigation:
"Any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards."

Hazard mitigation techniques include structural measures, such as strengthening buildings and infrastructure from the destructive forces of potential hazards, and non-structural measures such as adoption of sound land use policies and the creation of public awareness programs. Local government level implementation of mitigation measures is effective because local government makes decisions on the regulation and control of development. A comprehensive mitigation approach addresses hazard

vulnerabilities existing today and in the foreseeable future. The LMS is essential to evaluate projected patterns of future development and considers them in terms of how growth will increase or decrease a community's overall hazard vulnerability.

Key components of the comprehensive approach to hazard mitigation are developing, adopting, and updating as needed, a local hazard mitigation plan. A local hazard mitigation plan establishes the broad community vision and guiding principles for reducing hazard risk, and proposes mitigation actions to eliminate or reduce identified vulnerabilities.

The Polk County 2020 Multi-Jurisdictional Strategy (LMS) forms the basis for incorporating hazard mitigation principles and practices into the routine government activities and functions of Polk County and the jurisdictions within the County. The LMS recommends actions to protect residents from losses to hazards that pose the greatest threats. The mitigation actions recommend structural solutions to reduce existing vulnerability, such as elevation, retrofitting, and acquisition projects. Local policies governing community growth and development, incentives for natural resource protection, and public awareness and outreach activities are examples of additional actions to reduce Polk County's future vulnerability to identified hazards. The LMS is a living document, with implementation and evaluation procedures established to help achieve meaningful objectives and successful outcomes over time.

This LMS relates to the following jurisdictions in Polk County:

- Polk County
- Polk County Public Schools
- City of Auburndale
- City of Bartow
- City of Davenport
- Town of Dundee
- City of Eagle Lake
- City of Fort Meade
- City of Frostproof
- City of Haines City
- Village of Highland Park
- Town of Hillcrest Heights
- Town of Lake Alfred
- Town of Lake Hamilton
- City of Lake Wales
- City of Lakeland
- City of Mulberry
- City of Polk City
- City of Winter Haven

Each municipality in the County and the Polk County Public Schools may adopt the LMS once FEMA and Florida Division of Emergency Management (FDEM) have approved the LMS document.

SECTION I: INTRODUCTION

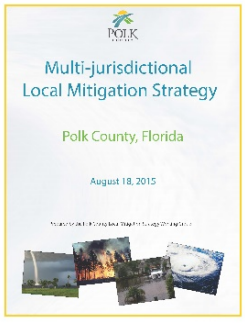
Disaster Mitigation Act of 2000

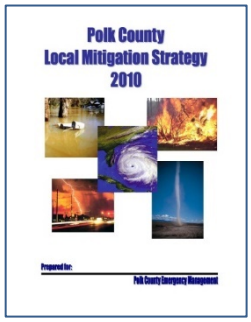
To reduce mounting natural disaster losses, the U.S. Congress passed the Disaster Mitigation Act of 2000 (DMA 2000) to amend the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Act), and to invoke new and revitalized approaches to mitigation planning. Section 322 of DMA 2000 emphasizes the need for close coordination on mitigation planning activities by State and local government entities. The Act makes the development of a hazard mitigation plan an eligibility requirement for any local government applying for Federal mitigation grant funds. These funds include the Hazard Mitigation Grant Program and the Pre-Disaster Mitigation program. FEMA administers both programs under the Department of Homeland Security. Communities with an adopted and Federally approved hazard mitigation plan thereby become pre-positioned and are more apt to receive available mitigation funds before and after the next disaster strikes.

FEMA set forth guidelines for the LMS in the Interim Final Rule in the Federal Register of 44 Code of Federal Regulations (CFR) Part 201. These requirements instruct that a Local Mitigation Strategy identify natural hazards and their impacts, identify actions to reduce losses resulting from the hazards, and create a process for the implementation of the LMS. For Polk County and its jurisdictions to remain eligible for Federal mitigation funds, the County must review, revise, and resubmit an updated LMS for approval every five years.

Polk County LMS History

Polk County and its jurisdictions created the Polk County LMS in 1999. In 2010, the County and its jurisdictions updated the LMS. In 2015, the update included a reorganization of the document. The 2020 update to the LMS was prepared in coordination with FEMA Region IV and FDEM to ensure that the LMS meets all applicable DMA 2000 and State requirements.





Purpose

The purpose of the LMS is to develop and execute an ongoing strategy for reducing the community's vulnerability to identified natural, technological, and human-caused hazards. The LMS provides a rational, managed basis for considering and prioritizing hazard-specific mitigation options and for developing and executing cost-effective mitigation projects. The LMS provides a foundation for justifying the solicitation and use of local, State, Federal, and other funding to support hazard mitigation projects and initiatives.

SECTION I: INTRODUCTION

The LMS establishes an ongoing process that makes hazard mitigation part of the daily functions of the entire community including the public and private sectors and residents. The LMS serves as a bridge between local governments' comprehensive growth management plans, the County Comprehensive Emergency Management Plan (CEMP), land development regulations, and relevant ordinances and codes such as floodplain management policies. The LMS integrates mitigation initiatives set forth in various policies, programs, and regulations into a single stand-alone document.

Authority

The LMS Working Group developed the LMS in accordance with current State and Federal rules and regulations governing local hazard mitigation plans. Polk County and its jurisdictions will adopt the LMS in accordance with standard local procedures. Section VIII includes copies of local adoption resolutions. The LMS partners shall routinely monitor, review, and revise the LMS, as necessary, to maintain compliance with the following provisions, rules, and legislation:

- Section 322, Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as enacted by Section 104 of the Disaster Mitigation Act of 2000 (P.L. 106-390);
- FEMA's Interim Final Rule published in the Federal Register on February 26, 2002, at 44 CFR Part 201;
- Flood Insurance Reform Act of 2004 (P.L. 108-264); and
- Flood Insurance Reform Act of 2012.

LMS Contents

The LMS includes the following sections to address FEMA requirements for a local mitigation plan.

- Section I: Introduction
- Section II: What's New
- Section III: Planning Process, Evaluation, and Maintenance
- Section IV: Community Profile
- Section V: Hazard Identification and Analysis
- Section VI: Hazard Vulnerability and Risk Assessment
- Section VII: Mitigation Plan
- Section VIII: LMS Adoption
- Section IX: Resources
- Appendices

SECTION II – WHAT'S NEW

The What's New Section outlines updates and changes between and during local mitigation strategy updates by cataloging changes to the overall document.

The 2020 LMS Update

The Polk County 2020 Multi-jurisdictional Local Mitigation Strategy (LMS) includes minor changes to the structure of the LMS. The LMS includes a new section titled – Section II: What's New. In this section, the LMS Working Group identified the strategy status and successes for each update period. The 2015 LMS update included a separate Planning Process section and Maintenance and Evaluation section. The LMS Working Group voted to combine these sections into the Planning Process section since they are interrelated.

The LMS Working Group voted to amend the hazard vulnerability risk level for the LMS from the current form indicating Low, Moderate, High, and Very High to the approach utilized in the 2018 Florida Enhanced State Hazard Mitigation Plan outlined below.

- Low (One Occurrence every 10 years)
- Medium (One occurrence every 5-7 years)
- Medium/High (One occurrence every 3 years)
- High (One or more occurrence each year)

The LMS Working Group established a Community Rating System (CRS) Subgroup to ensure the LMS meets the floodplain management plan requirements and provides tools necessary to assist existing and prospective CRS communities.

The LMS extends the hazards analysis to include civil disturbances and terrorism, cyber-attacks, and transportation incidents. To meet the requirement that the project list include a comprehensive range of projects for each hazard, and not be on a "grant wish list", the project list identifies ongoing projects and one-time (long-range) projects.

The LMS Working Group sought participation from municipal and County departments and community organizations that implement mitigation actions or policies. Efforts included invitations to attend meetings and to serve on the LMS Working Group, access to the project website, e-mail updates, strategy development workshops, and opportunities to comment on draft deliverables.

The COVID-19 pandemic impacted the second stage of the public engagement component of the LMS as described in Section III. Social distancing and safer-at-home orders limited the opportunities for in-person public engagement. The Working Group utilized a more extensive online platform for public input.

Addressing 2015 LMS Challenges

To address the challenges identified since the 2015 LMS, the LMS Working Group will hold semi-annual meetings to promote greater attendance and participation. The LMS Working Group will provide an increased focus on incorporating mitigation information into planning mechanisms by facilitating

meetings with local planners and public works departments to ensure review and consideration of identified hazard areas when addressing proposed development options. The LMS Working Group will identify opportunities for partnership to ensure information regarding potential hazards and risks is available to the public.

LMS Successes and Challenges since 2015 Update

Successes

- Jurisdictions completed several projects identified in the Mitigation Action Plan.
- The LMS Working Group submitted all eligible projects for Hurricane Irma Hazard Mitigation Grant Program funding.
- The Federal Emergency Management Agency verified the City of Lake Alfred for Community Rating System (CRS) Participation.
- All municipalities continue to include mitigation practices in development and redevelopment projects through inclusion in comprehensive plans, capital improvement plans, and development regulations.
- Several municipalities, with the assistance of the Southwest Florida Water Management District, have completed stormwater master plans. These plans are critical to improving drainage and reducing flooding. These plans provide a guide for capital improvement spending.
- The municipalities participating in the National Flood Insurance Program adopted updated flood maps in 2016.

Challenges

The LMS Working Group did not implement all the strategies as outlined in the Plan Monitoring, Maintenance, and Evaluation Section. The annual LMS Working Group meetings did not update the LMS document to address changes that occurred in the prior year. Jurisdictions did not work to incorporate the LMS into other planning mechanisms.

The 2015 LMS Update

The LMS Working Group prepared the 2015 LMS update with assistance from the Central Florida Regional Planning Council. LMS Working Group Chair Paul Womble, Polk County Emergency Management, led the update process. The update of the LMS began in August 2014. The 2015 LMS update included a restructuring of the LMS. All partners adopted the 2015 LMS update.

SECTION III – PLANNING PROCESS, EVALUATION, AND MAINTENANCE

44 Code of Federal Regulations	
44 CFR §201.6(b)(1):	The planning process shall include an opportunity for the public to comment on the plan during the drafting stage and prior to plan approval.
44 CFR §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.
44 CFR §201.6(b)(3):	Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.
44 CFR §201.6(c)(1):	Documentation of the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.
44 CFR §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.
44 CFR §201.6(c)(4)(ii):	A process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.
44 CFR §201.6(c)(4)(iii):	Discussion on how the community will continue public participation in the plan maintenance process.

This Section presents the planning, evaluation, and maintenance process that ensures the Polk County 2020 Multi-Jurisdictional Local Mitigation Strategy (LMS) remains an active and relevant document. This section discusses how the public will continue to be involved in a sustained hazard mitigation planning process.

Overview

Local hazard mitigation planning is the process of organizing community resources, identifying and assessing hazard risks, and determining how to best minimize or manage those risks. This process culminates in a hazard mitigation plan that identifies mitigation actions, each designed to achieve short-term planning objectives and a long-term community vision.

To ensure the functionality of a hazard mitigation plan, the LMS includes the person, department, or agency responsible for each proposed mitigation action and a schedule or target completion date for each action's implementation. The LMS includes procedures for routine monitoring implementation progress and the evaluation and enhancement of the LMS. These LMS maintenance procedures ensure the LMS remains a current, dynamic, and effective planning document over time that becomes integrated into the routine local decision-making process. Communities that participate in hazard mitigation planning may experience many benefits, including:

- Saving lives and property;
- Saving money;
- Accelerating recovery following disasters;
- Reducing future vulnerability through wise development and post-disaster recovery and reconstruction;
- Expediting receipt of pre-disaster and post-disaster grant funding; and
- Demonstrating a firm commitment to improving community health and safety.

SECTION III: PLANNING PROCESS, EVALUATION, AND MAINTENANCE

Mitigation planning has the potential to produce long-term and recurring benefits by breaking the repetitive cycle of disaster loss. A core assumption of hazard mitigation is investments made before a hazard event will significantly reduce demand for post-disaster assistance by lessening the need for emergency response, repair, recovery, and reconstruction. Mitigation practices enable residents, businesses, and industries to re-establish themselves in the wake of a disaster, getting the community economy back on track sooner and with less interruption.

Benefits of mitigation planning go beyond reducing hazard vulnerability. Measures of acquisition or regulation of land in known hazard areas may help achieve multiple community goals such as preserving open space, maintaining environmental health, and enhancing recreational opportunities. Local governments should integrate the mitigation planning process with other concurrent local planning efforts, and any proposed mitigation strategies should consider other existing community goals and initiatives that will either complement or hinder implementation.

History of Hazard Mitigation in Polk County

Polk County and its jurisdictions formally adopted the first Polk County LMS in 1999. The Florida Department of Community Affairs/Florida Division of Emergency Management (FDCA/FDEM) funded initial development of the LMS, in part, with Federal Emergency Management Agency (FEMA) funds earmarked for development of comprehensive hazard mitigation planning.

The LMS continues to operate in accordance with prevailing Federal, State, and local guidelines and requirements. In 2010, the County and its jurisdictions updated the LMS in accordance with all FEMA and State of Florida guidelines. The 2015 LMS update included reformatting the document to increase public accessibility and user friendliness. The 2020 update to the LMS has been prepared in coordination with FEMA Region IV and FDEM to ensure that the LMS meets all applicable DMA 2000 and State requirements. Appendix C includes copies of announcements, invitations, and minutes. Section II of this document includes information on the changes for each update.

The 2020 LMS Update

The LMS Working Group prepared the 2020 LMS update with assistance from the Central Florida Regional Planning Council (CFRPC). The LMS Working Group Chair, Greg Becker and Vice-Chair Jerri Kaplan, Polk County Division of Emergency Management led the update process, which began in September 2019.

The Polk County LMS Working Group utilized the mitigation planning process recommended by FDEM to complete the update. A Local Mitigation Plan Crosswalk, located in Appendix D, provides a detailed summary of FEMA's minimum standards of acceptability for compliance with DMA 2000 and notes the location of each requirement within the LMS. Part 201 of the 44 Code of Federal Regulations is the standard for the requirements.

The LMS update process identified additional hazards, updated the risk assessment using the most recent and best data available, and evaluated existing mitigation goals, projects, and programs for overall effectiveness. The hazard analysis includes the hazards from the 2020 LMS hazard profile, information from the 2018 Florida Enhanced State Hazard Mitigation Plan effective August 24, 2018, and hazards

identified in other emergency management plans for Polk County. The LMS follows FEMA's 2020 Crosswalk and the associated planning guidance.
The LMS Working Group prepared the 2020 LMS update using and incorporating relevant content from the 2015 Polk County Local Mitigation Strategy. The LMS Working Group updated relevant sections of the LMS.

- **Public Involvement**
  To facilitate increased public involvement, the LMS Working Group will attend different events during the drafting and review stages of the document to provide the opportunity for public information and input. The LMS Working Group created a dedicated project website, facilitated coordination with jurisdictions for access to their websites, and encouraged the use of social media.

- **Plan Format**
  The proposed document includes a new section – Section II: What's New. This section identifies the strategy status and successes for each update period. The 2015 LMS included a separate Planning Process section and Maintenance, and Evaluation section. The 2020 LMS combines these sections into the Planning Process section since they are interrelated. The document is ADA Accessibility formatted so jurisdictions may place it on websites.

- **Hazard Identification**
  The LMS extends the hazards analysis to include civil disturbances and terrorism, cyber-attacks, and transportation incidents.

- **Goals and Objectives**
  The LMS Working Group reviewed goals and objectives and determined the need for reorganization and amendments.

- **Mitigation Project List**
  To meet the requirement that the project list include a comprehensive range of projects for each hazard and not be a "grant wish list," the project list includes ongoing projects and long-range projects.

- **STAPLEE System**
  The LMS Working Group evaluated the cost-benefit review system known as the Social Technical Administrative Political Legal Economic Environmental System (STAPLEE System), and determined the system is working well for the County and should remain. The LMS Working Group agreed to update the cost/benefit analysis requirement process consistent with the FEMA Local Mitigation Handbook (2019).

For the 2020 LMS update, staff met with local planners, agencies, and other organizations to gather information and review concepts. The LMS Working Group held public meetings throughout the update process to review the existing LMS and discuss potential amendments. The meetings included representatives from jurisdictions and community organizations. Attendees provided input at key stages of the process. Appendix C includes sign-in sheets and meeting summaries for each of the LMS Working Group meetings.

SECTION III: PLANNING PROCESS, EVALUATION, AND MAINTENANCE

Multi-Jurisdictional Participation

The LMS includes one county, its unincorporated areas, 17 municipalities, and the Polk County Public Schools. To satisfy multi-jurisdictional participation requirements, FEMA requires the County and jurisdictions perform the following tasks:

- Participate in mitigation planning workshops;
- Provide data for the Hazard Analysis and Risk Assessment, as needed;
- Identify completed mitigation projects, if applicable; and
- Adopt the LMS.

Each of the jurisdictions listed below contributed to the planning process and are seeking approval of the LMS. The following jurisdictions may adopt the LMS.

- Polk County
- Polk County Public Schools
- City of Auburndale
- City of Bartow
- City of Davenport
- Town of Dundee
- City of Eagle Lake
- City of Fort Meade
- City of Frostproof
- City of Haines City
- Village of Highland Park
- Town of Hillcrest Heights
- City of Lake Alfred
- Town of Lake Hamilton
- City of Lake Wales
- City of Lakeland
- City of Mulberry
- City of Polk City
- City of Winter Haven

Local Mitigation Strategy (LMS) Working Group

The LMS Working Group is a partnership of government entities, public and private organizations, and individuals with a shared interest in producing proactive initiatives for prevention and protection from hazards. The LMS Working Group serves as an umbrella organization coordinating all mitigation programs and activities, supplies staffing for sub-committees, and is the primary forum for exchanging information and mobilizing the expertise and resources of the community. The LMS Working Group helps collect and disseminate information and policies relevant to the community. The LMS Working Group is the lead coordinating and facilitating body for hazard mitigation in the County and continues to serve as the focal point for community and private and public involvement in hazard mitigation activities. The LMS Working Group includes representatives that implement or have expertise in the different activities that could prevent or reduce the severity of the impacts from hazards identified in the LMS. These departments include utilities, law enforcement, fire, building, code enforcement, engineering, land use and planning, public works, emergency management/public safety, public information, environmental protection/public heath, parks and recreation, city management, and housing/community development. Appendix C includes the LMS Working Group Membership Roster, sign-in sheets, notices, agendas, presentation materials, and minutes. All meetings of the LMS Working Group are open to the public.

Figure III.1: LMS Working Group; Source: CFRPC

Local Mitigation Strategy Coordinator

The LMS Working Group designates the Polk County Division of Emergency Management as the LMS Coordinator. The LMS Coordinator is a staff member within the Emergency Management Division who serves as the coordinator for all mitigation projects, subgroups, and mitigation funding designated for the County. The LMS Coordinator facilitates group and subgroup meetings and may serve as a County representative on outside committees. Additional LMS Coordinator responsibilities include:

- Supervise all revisions and updates to the LMS every five years.
- Incorporate minor changes and additions to the LMS during interim periods (Section II, What's New, documents those changes).
- Monitor changes in Federal, State, and local laws in mitigation that may affect the County.
- Propose the LMS for approval by FDEM, and adoption by the Polk County Board of County Commissioners, the Polk County Public Schools, and local municipalities.
- Store and file documents pertaining to mitigation issues.
- Coordinate the Multi-jurisdictional Mitigation Action Plan (MAP) and the prioritization process that scores and ranks projects in the County that may be eligible for Federal funding.
- Interface with appropriate governmental and non-governmental agencies and offices to ensure LMS goals, objectives, and priorities are consistent with and cross-referenced with those articulated in other existing plans including the County's Comprehensive Emergency Management Plan (CEMP).
- Monitor, maintain, and evaluate the LMS, as described later in this section.
- Seek opportunities at the regional, County, and municipal levels to:
    - Update plans, policies, regulations, and other directives to include hazard mitigation priorities;
    - Encourage the adoption of mitigation priorities within capital and operational budgets and grant applications;
    - Share information on grant funding opportunities;
    - Offer guidance for carrying out mitigation actions;
    - Explore opportunities for collaborative mitigation projects and initiatives; and
    - Facilitate and coordinate the application process and serve as a primary communicator with funding agencies.

LMS Subgroups

The LMS process established and utilized a Goals and Objectives Subgroup and a Community Rating System Subgroup.

Goals and Objectives Subgroup

The LMS Working Group established a Goals and Objectives Subgroup for the 2020 LMS update to review and update the Goals and Objectives of the LMS. This subgroup prepared recommended amendments to the LMS goals and objectives. The LMS Working Group reviewed and voted to adopt the recommended Goals and Objectives from the Goals and Objectives Subgroup. While this is not a standing subgroup, the LMS Working Group may reinstate it if necessary.

Community Rating System (CRS) Subgroup

Comprised of representatives of the County's CRS Communities, this subgroup meets semi-annually to discuss issues regarding CRS updates, to collaborate on best practices for assisting jurisdictions to achieve a higher rate class and therefore an increase in the flood insurance discount rate for its citizens, and to share information regarding CRS-related training. This group collaborates with other local governments, local business leaders, and members of the public on a full range of Outreach Projects Strategy (OPS) initiatives to promote CRS participation. This subgroup reviews the floodplain management portions of the LMS and all initiatives relating to the CRS to ensure the information is current.

Participation Requirements

Since the LMS Working Group writes the LMS using input from all stakeholders, it is important to make sure there is representation from the entire Polk County community. Each stakeholder has different participation requirements and the LMS Working Group encourages all stakeholders to participate in the process.

Jurisdictions

County, municipal, and government agency participation is critical to the success of the LMS. To retain LMS voting rights, qualify for Federal mitigation assistance consideration, and otherwise remain a member in good standing, FEMA requires all jurisdictions to conform to the following standards:

- Participation of the representative or alternate in the semi-annual LMS Working Group meetings; or participation in a majority of the LMS subgroup meetings; and
- Have an officially executed resolution adopting the revised LMS on file with the County. A jurisdiction must have an officially adopted resolution to be eligible for Hazard Mitigation Grant Program (HMGP), Flood Mitigation Assistance Program (FMAP), and Pre-Disaster Mitigation (PDM) funding programs.

The LMS Coordinator will notify all jurisdictions of meetings via email at least one week in advance and will provide meeting summaries thereafter.

Non-Governmental Organizations (NGO), Other Governmental Entities, and Stakeholders

The LMS Working Group encourages participation by non-governmental organizations (NGO), other governmental entities, and stakeholders. To qualify for LMS grant sponsorship, NGOs, and other governmental entities must:

- Have a duly executed letter of commitment to the LMS on file with the County; and
- Actively participate in and support LMS activities.

The Public and Private Sector

Broad community support, including ongoing public and private sector involvement, is important to the success of the LMS. While participation by private organizations and the public is voluntary, the LMS Working Group, through the LMS Coordinator, seeks, invites, monitors, and fully documents the attendance, comments, contributions, and support from private organizations and the public. To promote the opportunity for broad participation, the LMS Coordinator posts notices and agendas for general meetings of the LMS through press releases, social media, postings on County and municipal websites, announcements in the County and municipal newsletters and calendars, and e-mail to past participants. According to the County's Communication Division, social media reaches the most people in Polk County. The LMS Coordinator actively solicits new LMS members by reaching out to private sector and nonprofit organizations to encourage participation.

Public Involvement, Citizen Input, and Stakeholder Involvement

In addition to LMS Working Group meetings, Polk County encouraged more open and widespread participation in the mitigation planning process by extending its local outreach efforts through community events and the dedicated project website, with the option to provide anonymous comments and to use social media. Providing information at public events helps increase public involvement. These efforts provide opportunities for local officials, residents, businesses, academia, and other private interests in the County to be involved and offer input throughout the local mitigation planning process.

As citizens become more involved in decisions that affect their safety, they are likely to gain a greater appreciation of the hazards present in the community and to take steps necessary to reduce their impacts. Public awareness is a key component of any community's overall mitigation strategy aimed at making a home, neighborhood, school, business, or city safer from the potential effects of hazards. The LMS Working Group sought public input using methods discussed below.

Community Events and Meetings

Community events occurred during two stages of the planning process: 1) the document drafting stage (prior to February 2020); and 2) following the completion of the draft plan prior to LMS approval (after February 2020). The COVID-19 pandemic impacted the second stage of the community events and meetings. Social distancing and safer-at-home orders limited the opportunities for in-person public engagement.

The purpose of attendance at community events is to present the findings of the risk and capability assessments, and to garner input regarding unique hazard concerns and possible mitigation actions for potential inclusion in the LMS, including ideas for policies and projects. This public outreach effort is also an opportunity for neighboring municipalities, agencies, businesses, academia, nonprofit organizations, and other interested parties to be involved in the planning process. Appendix C includes information from each event, including sign-in sheets, presentation materials, and photos.

September 28-29, 2019 – Home and Garden Show

The LMS Working Group hosted an information booth with the Polk County Building Division at the Lakeland Home and Garden Show. The booth included information about the LMS, the update process, and maps and data specific to hazards from the 2015 LMS. Participants who stopped at the booth were able to participate in a survey regarding hazards. Staff distributed postcards with information about the project's website and a QR code for scanning (See Appendix C).

October 29, 2019 – Fort Meade Community Workshop

The City of Fort Meade held a community workshop to discuss an action-oriented economic development and disaster preparedness strategy. Part of the presentation included a discussion of risk, mitigation, and the LMS. Attendees completed the LMS survey. Staff distributed postcards with information about the project's website and a QR code for scanning (See Appendix C).

November 4, 2019 – Lake Wales Fire Station presentation

Staff gave a community disaster preparedness presentation at the Lake Wales Fire Station. As a part of the meeting, staff presented information and answered questions about hazards in the County and the LMS update process. Participants completed the LMS survey. Staff distributed postcards with information about the project's website and a QR code for scanning (See Appendix C).

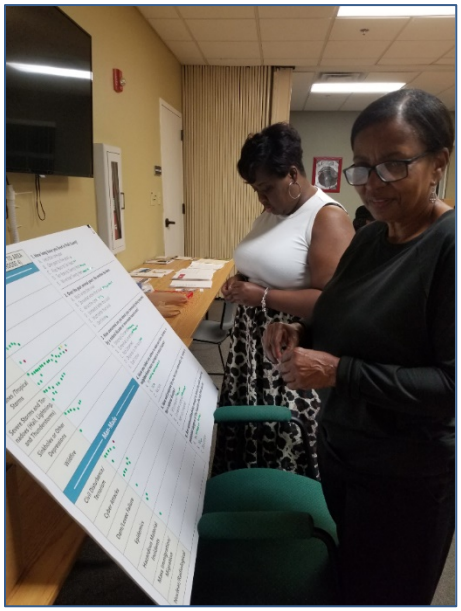


Figure III.2: Survey participants at fire station presentation; Source; CFRPC

January 10, 2020 – Emergency Preparedness Advisory Council

Staff provided an update on the 2020 LMS update and invited people to participate in the update process. A copy of the agenda from the meeting is in Appendix C.

February 22, 2020 – Lake Alfred Heritage Festival

The LMS Working Group hosted an information booth in conjunction with the Polk Census 2020 Complete Counts Committee at the Lake Alfred Heritage Festival. The booth included information about the LMS, the update process, and maps and data specific to hazards from the draft LMS. Participants who stopped

at the booth were able to participate in the ongoing survey regarding hazards. Staff distributed postcards with information about the project's website.

February 22-23, 2020 – Home and Garden Show

The LMS Working Group hosted an information booth with the Polk County Census Complete Counts Committee at the Lakeland Home and Garden Show. The booth included information about the LMS, the update process, and maps and data specific to hazards from the draft LMS update. Participants who stopped at the booth participated in a survey regarding hazards. Staff distributed postcards with information about the project's website.

To Be Determined – Library and City Hall Information Tour

An information board series will rotate through libraries and city halls throughout the County so people visiting these facilities will have an opportunity to review the information and provide comments. Staff will schedule this tour as safer-at-home orders and social distancing measures addressing the COVID-19 pandemic permit.

To Be Determined – Hurricane Expo Events

Staff will present information, answer questions, and obtain comments from the public on the LMS at the Auburndale Hurricane Expo and/or the Flying Tigers Emergency Preparedness Night. The City of Auburndale hosts a hurricane expo to help citizens prepare for hurricane season. Minor League Baseball partners with the FEMA's Ready Campaign and Citizen Corps Program to educate and empower Americans to prepare for and respond to emergencies including natural disasters and potential terrorist attacks. This event provides an opportunity for the public to comment on the LMS prior to its approval and adoption. Staff will provide notification for this event through newspaper advertisements and articles, flyers, website notification, and the use of social media outlets. Appendix C will include information regarding this event. Due to the Florida coronavirus safer-at-home order and social distancing measures, the hosts of these events may reschedule them to a later date.

Spring/Summer 2020 – Local Government Meetings

The public may view the LMS update information at a Board of County Commissioners' meeting on a date to be determined. People attending the meeting or doing business in the County Administration Building may review and comment on the information placed at the information station. During the Board of County Commissioners meeting, staff will present information regarding the update process and solicit comments from the public. Polk County televises the Board of County Commissioners meetings. Appendix C will include sign-in sheets and minutes from the event.

Website

To facilitate review and participation by the LMS Working Group and to provide other avenues for public involvement, staff developed a website dedicated to the update of the LMS: www.polkcountylms.org. The website provides information on the purpose of the LMS, the update process, meetings and events, and opportunities for public involvement. The elements of the draft LMS are available for review and comment. The website includes a link to the survey utilized at the public outreach events.

In addition to the project website, jurisdictions' websites have included information relating to the LMS and LMS events.

Figure III.3: LMS website

Facebook and Social Media

The LMS Working Group utilized social media to increase exposure of the LMS update to as many people as possible. County staff posted information related to the LMS Update Community Workshop on Polk County's Facebook page, and those posts carried through to other Facebook pages. As of January 2020, the outreach through Facebook and Nextdoor is as follows:

- Facebook:
  - Reach: 28,672
  - Engagement: 759
  - Likes: 75
  - Comments: 11
  - Shares: 22
- NextDoor:
  - Impressions: 8,738
  - Thanks: 17
  - Comments: 1

Partnership with Census 2020 Complete Count Committee

The Polk County Census 2020 Complete Count Committee is working to provide information to the public regarding the importance of completing the 2020 Census. Accurate Census count information is important to the LMS Planning process as it allows for better analysis of impacts to population and to determine the best means for mitigation and education. Staff and the Census 2020 Complete Count Committee are partnering to distribute information relating to the Census 2020 process and the LMS update.

Incorporation of Public Comments and Feedback

Throughout the drafting and review process, the LMS Working Group sought input from the public through a variety of mediums. Most of the feedback received related to the information presented on

maps and in figures and graphs. The LMS Working Group gave the public opportunities to complete the LMS survey during the drafting stage (through February 28, 2020) and the review stage (March 2020 through June 2020). Appendix C includes the survey results. The LMS Coordinator forwarded all stakeholder and the public comments related to information included in the LMS and proposed projects to the LMS Working Group for review and potential incorporation into the LMS.

Adoption of LMS

Jurisdictions wishing to participate in and share in the benefits of the LMS must complete and file a fully-executed resolution which conforms to the adoption standards established and amended by the Polk County Board of County Commissioners and the LMS Working Group. Section VIII includes a sample resolution and Appendix H includes the adoption resolutions of the jurisdictions.

LMS Monitoring, Maintenance, and Evaluation

The LMS Working Group, through the LMS Coordinator, monitors, maintains, and evaluates the LMS to meet the changing needs of the community. The LMS Coordinator will monitor the LMS on a continuous basis to ensure that pre-disaster planning and mitigation initiatives are attainable and cost effective. To ensure that implementation continues throughout the duration of the LMS, each agency or jurisdiction responsible for specific mitigation projects will provide status updates to the LMS Coordinator as project changes occur and on an annual basis.

The criteria used to evaluate the LMS and activities should include, but not be limited to:

- Federal and State requirements.
- Changes in development trends and land use that could affect infrastructure (water, sewer, stormwater, roads, traffic, etc.).
- Storms, other natural processes, and human-caused events that have altered Polk County's hazard areas (wind damage, flooding, erosion, etc.).
- Completion of existing mitigation projects and introduction of new goals.
- Changes in policy, procedure, or codes.
- Changes in building codes and practices.
- Legislative actions that could affect funding of mitigation efforts; and
- Changes in Flood Insurance Rate Maps, National Flood Insurance Program, etc.

LMS Updates

The LMS Working Group will review the LMS on a semi-annual basis to consider changes and amendments needed between the update periods or after a major disaster declaration in which jurisdictions need to propose new mitigation initiatives based on damage assessments. In a non-disaster situation, the LMS Coordinator, based upon a determination of personnel and resource availability, will determine the revision period. The LMS Working Group will meet to review, evaluate the effectiveness of, and revise (if necessary) the LMS under the following circumstances:

- On a semi-annual basis;
- Within 90 days after a major disaster declaration;
- When events substantially alter or negate parts of the strategy;

- At the request of at least three members of the LMS Working Group; or
- At the request of an adopting jurisdiction.

Annual LMS Update Requirement

Florida Administrative Code (FAC) Chapter 27P-22 (Hazard Mitigation Grant Program) requires submittal of an annual LMS update to FDEM by the last working weekday of each January. To meet this deadline, the LMS Working Group will annually update the LMS in December/January. The LMS Coordinator will complete this update with input from LMS Working Group members. Per FAC 27P-22.004, the annual LMS update shall address, at a minimum, the following items:

- LMS Working Group membership with designated Chairperson and Vice-Chairperson;
- Documentation to indicate that within the preceding year the LMS Working Group issued a written invitation to each municipality, private organization, civic organization, Native American Tribe or authorized tribal organization, water management district, independent special district, and non-profit organization, as applicable;
- Changes to the hazard assessment;
- Changes to the project priority list;
- Changes to the critical facilities list;
- Changes to the repetitive loss list; and
- Revisions to maps.

The LMS Working Group will evaluate the effectiveness of the LMS at achieving the adopted goals and objectives and make any necessary changes. The LMS Working Group will evaluate each initiative incorporated into the MAP (Section VII and Appendix B) for status and priority level. The entity responsible for each initiative shall provide an update on the proposed project(s) including:

- Changes to the hazard assessment in relation to the proposed project;
- Changes in community and political acceptance of implementation or maintenance of the proposed project; and
- Current probability of receiving implementation funding.

Five-Year LMS Update Requirement

The LMS Working Group will conduct a formal LMS update every five years, in accordance with 44 CFR §201.6(d)3, revise the LMS if necessary, to reflect any changes in priorities, and resubmit for approval to continue to be eligible for mitigation grant funding. To meet the five-year LMS Update requirement, the LMS Coordinator (with input from LMS Working Group members) will review the entire document to be sure that the information included accurately reflects the status of the County and its jurisdictions. The LMS Working Group will update all sections of the LMS document as necessary.

The five-year update process will begin approximately 18 months prior to the expiration of the LMS. This will allow the LMS Working Group to begin meeting with ample time to review the LMS and make updates with public involvement and agency collaboration. Staff will be able to complete work necessary as part of the State review process with time for the LMS Working Group to make necessary revisions prior to the expiration of the LMS.

Continued Public Involvement

The LMS Working Group recognizes public participation is vital to the mitigation planning process. The LMS Working Group is committed to continued public involvement in the planning and review process. During all phases of LMS maintenance, the public will have the opportunity to provide feedback. The LMS Working Group will maintain the LMS and make it available for use and review on the website. Individuals will have an opportunity to submit comments for the LMS update at any time through the website, email, phone, or mail. The LMS Coordinator will compile all comments and present them at LMS Working Group meetings where members will consider them for incorporation in the update.

The LMS Working Group strives to include the public in the LMS update process. To encourage public participation and awareness of the LMS, efforts to involve the public in the maintenance, evaluation, and revision process may include:

- Advertise meetings of the LMS Working Group in local newspapers, public bulletin boards, jurisdiction bulletin boards, public notice spaces at libraries and other public locations, and social media;
- Work with local news media to update the public on any maintenance or review activities;
- Make the LMS available for review on the County's website, at the County Administration Building, and jurisdiction administration buildings;
- Utilize websites of LMS Working Group member organizations to provide information and links to the LMS update and announcements of future LMS Working Group meetings;
- Utilize email and other technological services such as social media and online survey websites to communicate and receive input from LMS Working Group members and the public;
- Participate in events such as the annual Public Works Week, the Hurricane Expo, and street fairs to provide information and opportunities for citizen participation;
- Collaborate with local businesses such as grocery stores to include information in annual hurricane preparation community outreach efforts;
- As time and budget allow, mail notices about meetings and information about the LMS process to different organizations throughout the community. These may include local Lions Clubs, chapters of Kiwanis International, Women's Clubs, gardening clubs, and homeowners' associations; and
- As time and budget allow, the LMS Working Group shall provide presentations to local governments, schools, clubs, and other potential stakeholders to expand participation in the planning process.

These efforts provide the public an opportunity to express concerns, opinions, and ideas about updates and changes proposed to the LMS. Finding ways to interest and involve more people and organizations in the overall process is a challenge the LMS Working Group will continue to address throughout the LMS maintenance process.

Incorporation into Existing Planning Mechanisms

As part of the LMS update process, the LMS Working Group identified current plans, programs, policies, ordinances, studies, and reports to augment and support mitigation planning efforts. Several existing plans, programs, policies, and ordinances incorporate the LMS including:

- Polk County Comprehensive Emergency Management Plan – The CEMP incorporates the LMS by reference and utilizes the LMS as the plan's mitigation section.

- Polk County Post Disaster Redevelopment Plan (PDRP) – The PDRP references the LMS providing corresponding goals and utilizes the LMS hazard analysis. The mitigation actions in the LMS help address the issues addressed in the PDRP.

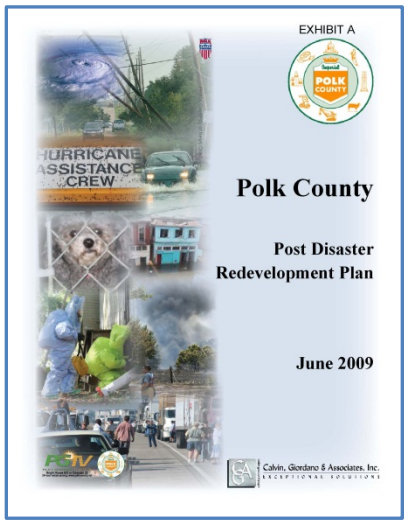


Figure III.4: Cover of Polk County Post Disaster Redevelopment Plan June 2009

- Polk County Community Wildfire Protection Plan (CWPP) – The CWPP furthers the LMS goals and mitigation strategies and is consistent with recommendations of the LMS Working Group.

- Community Rating System (CRS) – The CRS plans for the City of Lakeland, City of Lake Alfred, and unincorporated Polk County reference the LMS.

- Comprehensive Plans – Polk County and the 17 municipalities within Polk County have incorporated Hazard Mitigation goals and objectives into their Comprehensive Plans through the Future Land Use, Intergovernmental Coordination, Transportation, and Capital Improvement Elements.

- Central Florida Regional Planning Council – Strategic Regional Policy Plan (SRPP) – The SRPP makes emergency preparedness a priority in the central Florida region.

- Floodplain Management Plan – Polk County and municipalities utilize the LMS as their floodplain management plan, including the risk assessment, National Flood Insurance Program compliance, and flood related mitigation actions.

- Eagle Lake Stormwater Master Plan – The City of Eagle Lake produced a study which provided mitigation projects. The City needs to forward these projects to the LMS Working Group for inclusion in the LMS regarding flooding and stormwater improvements.

SECTION III: PLANNING PROCESS, EVALUATION, AND MAINTENANCE

Integration Process

Members of the LMS Working Group will work with the entities they represent to incorporate, where applicable, the LMS into other planning mechanisms. Throughout the LMS maintenance cycle, the LMS Working Group will work with appropriate governmental and non-governmental agencies to ensure LMS goals, objectives, and priorities are consistent and cross-referenced with those articulated in other existing plans. The Member organizations of the LMS Working Group will seek opportunities at the regional, County, and municipal levels to:

- Update work plans, policies, regulations, procedures, and other directives to include hazard mitigation concepts and priorities.
- Encourage the adoption of mitigation priorities within capital and operational budgets and grant applications.
- Share information on grant funding opportunities.
- Offer guidance for carrying out mitigation actions.
- Explore opportunities for collaborative mitigation projects and initiatives.
- Incorporate references to the LMS into the comprehensive plans of all outstanding municipalities; and
- Add hazard mitigation elements to redevelopment plans.

Members of the LMS Working Group will follow the process below to ensure widespread integration of hazard mitigation principles into local planning mechanisms in Polk County.

1) The LMS Working Group will invite each local planning director and/or representative planner for each jurisdiction to attend meetings to discuss ways in which hazard mitigation can be best integrated into planning matters.

2) The LMS Working Group will ask each director to work with their planning staff to develop a strategy to integrate hazard mitigation into planning programs and to evaluate whether their regulations address hazard mitigation, and if found to be lacking, identify several possible alternatives.

3) The local planning director and/or representative planner for each jurisdiction will report the status of their community and identified changes to the LMS Working Group.

4) The LMS Working Group will make identified changes through the LMS amendment process as discussed in the Incorporation of LMS into local government comprehensive plans and land development regulations section.

A similar process will be used by the LMS Working Group to study the feasibility and implementation mechanics relative to other planning processes active in the County such as the Polk County Transportation Planning Organization (addressing transportation matters), State Housing Initiatives Partnership (active with low-income housing issues), and the CFRPC (works at a regional level).

SECTION III: PLANNING PROCESS, EVALUATION, AND MAINTENANCE

Incorporation of LMS into Local Government Comprehensive Plans and Land Development Regulations

To ensure the full implementation of the Polk County LMS, all participating local governments shall incorporate references to the LMS into their respective comprehensive plans following the procedures outlined in Section 163.3191, Florida Statutes (FS). The municipalities shall incorporate the LMS in their forthcoming preparation of the required Evaluation and Appraisal Reports (Section 163.3191, FS). The Florida Department of Economic Opportunity's Evaluation and Appraisal Notification Schedule 2019-2025 includes the following due dates:

- Unincorporated Polk County – August 1, 2024
- City of Auburndale – November 1, 2024
- City of Bartow – October 1, 2024
- City of Davenport – October 1, 2024
- Town of Dundee – October 1, 2024
- City of Eagle Lake – May 1, 2025
- City of Fort Meade – October 1, 2020
- City of Frostproof – November 1, 2024
- City of Haines City – January 1, 2025
- Village of Highland Park – November 1, 2024
- Town of Hillcrest Heights – February 1, 2020
- City of Lake Alfred – October 1, 2024
- Town of Lake Hamilton – May 1, 2025
- City of Lake Wales – June 1, 2019
- City of Lakeland – August 1, 2024
- City of Mulberry – April 1, 2019
- City of Polk City – June 1, 2020
- City of Winter Haven – October 1, 2025

Jurisdictions within Polk County shall use the provisions set forth in Section 163.3178 FS to review and update mitigation strategies post-event, and shall also consider post-event interagency hazard mitigation reports. Consistent with the provisions for identifying and funding capital improvement projects found in Section 163.3177 FS, local governments shall continue to develop funding mechanisms to use for approved County-wide mitigation initiatives.

Consistent with the provisions of Section 163.3177 FS, local governments shall emphasize mitigation goals during the annual preparation of capital improvement budgets, with special attention paid to the prioritization of regional, interlocal, and local projects.

Participating local governments shall emphasize mitigation funding during the annual budget process pursuant to the provisions of Section 163.3177 FS.

Polk County has plans other than the Comprehensive Plan that implement hazard mitigation activities including pre-disaster mitigation, event coordination and post disaster redevelopment. In 2004, Polk County incorporated the LMS as the floodplain plan. Polk County has developed, adopted, and implemented the following plans and programs:

- Community Rating System;
- Local Mitigation Strategy;
- Comprehensive Emergency Management Plan; and
- Post Disaster Redevelopment Plan.

While the Polk County Division of Emergency Management serves in the leadership role for the Polk County LMS, many County divisions, jurisdictions, non-governmental agencies, and private sector organizations have programs, resources, and capabilities that will be invaluable in efforts to improve the disaster resilience of the communities in Polk County.

While not specifically designed for specific hazard mitigation purposes, some programs still result in reduction of potential human or economic losses from disasters. For example, the original mandate for the protection of wetlands was to preserve environmental resources and habitat. However, it also has the effect of reducing vulnerability of populations and property in the hurricane evacuation zones and floodplain areas.

As part of the update process, the LMS Working Group is responsible for reviewing local agency activities and identifying all relevant programs and policies that have some impact on mitigation. To complete this task, members of the LMS Working Group have conducted local and countywide meetings and interviews to identify mitigation programs and policies.

Typically, activities fall into the following general categories:

- Emergency Management – planning, training, exercise, response, and recovery;
- Floodplain Management Programs – preventive, property protection, structural projects;
- Comprehensive Planning – preventive activities;
- Emergency Services – prevention and outreach
    - Law enforcement and security issues
    - Fire prevention, response, and safety
    - Hazardous material prevention, response, and safety
    - EMS, Health Care Risk Assessment, security, response;
- Critical Facilities and Infrastructure Vulnerability Assessment and Protection; and
- Communications – outreach, warning, education.

Tables III-1 through III-19 list the policies and regulations in each jurisdiction that support the local mitigation strategy. The language included in these tables is verbatim from each jurisdiction's plan.

TABLE III-1:
POLK COUNTY POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
Comprehensive Plan – Future Land Use Element	
Objective 2.123-G Local Mitigation Strategy	Polk County shall coordinate future land use designations to eliminate or reduce inconsistencies with the goals, objectives, and recommendations of the adopted Local Mitigation Strategy.
Policy 2.123-G1	The County, through the implementation of its land development regulation, will ensure that development approvals are consistent with the objectives and policies of the Local Mitigation Strategy. If the site is such that all beneficial use of the property is precluded due to the hazard identification/determination, then the County will consider purchasing the property for preservation purposes through the use of moneys from environmental lands preservation programs, grants or other similar sources of funding.
Land Development Code – Section 630 Flood Hazard Management and Flood Plain Protection	
Purpose and Intent	The flood hazard areas of Polk 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.

TABLE III-2:
CITY OF AUBURNDALE POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
Comprehensive Plan – Future Land Use Element	
Policy 1.4	Environmentally sensitive lands shall be defined as public supply potable water wellfield cones of influence, wetlands as identified by the Southwest Florida Water Management District (SWFWMD), floodplains as identified by the Federal Emergency Management Agency (FEMA); Areas of Critical State Concern as defined by Chapter 380, F.S.; and natural resources identified by State and Federal agencies. These areas shall be protected through the application of the City's zoning and site plan review regulations, which shall regulate the density and intensity of use, and shall incorporate techniques such as cluster development to protect these resources. Residential densities in areas of 100-Year floodplains shall not exceed 1 dwelling per 5 acres.
Objective 10 Coordination with the Objectives and Programs in the Polk County Hazard Mitigation Strategy; and Coordination with Chapter 380 Plans.	The City shall coordinate future land use designations with the County and surrounding municipalities to eliminate or reduce development in areas identified as having repetitive loss due to natural hazards and which are identified in the Polk County Hazard Mitigation Strategy; and the City shall coordinate with any resource planning and management plan prepared.
Policy 10.2	The City, through the implementation of its land development regulations, will ensure that development approvals are consistent with the objectives and policies of the Polk County Hazard Mitigation Strategy, August 1999, as amended. In so doing, the City shall specifically limit the extension of infrastructure to areas of repetitive loss due to natural hazards, especially within any 100-year floodplain or wetland area.
Policy 10.3	The City shall identify and include in the 5-Year Capital Improvements Plan equipment and facility improvements needed to insure the delivery of municipal services during and after a natural disaster such as hurricane or flood; and to maintain traffic flow on all key roadways and at critical intersections during heavy rainfall events.
Policy 10.4	In conjunction with the American Red Cross and the Polk County School Board, the City will develop plans for reduction of the shelter deficit state-wide.
Policy 10.5	The City hereby requires all operators/developers of mobile/manufactured home parks to provide hurricane shelters to be built in their park to house all mobile/manufactured home park residents. If the park has a population of part-time residents, the shelter

TABLE III-2:
CITY OF AUBURNDALE POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
	shall be large enough to house all park residents that reside in the park during the official Hurricane Season, from June 1 to November 1.
Policy 10.6	The City will develop, maintain and annually update a list of all mobile/manufactured home parks, all singly-sited mobile/manufactured homes, and all high-risk resident facilities, such as, nursing homes and adult restricted communities, within the City limits, in order to assist emergency managers during an evacuation. Persons at risk shall be provided written evacuation procedures and the location of shelters.
Policy 10.7	The City will trim trees on city rights-of-way on a regular, rotating schedule, and coordinate such activities with local power companies, in order to, reduce the incidence of blocked streets and storm hazards to overhead utility lines that may occur during periods of heavy rainfall and especially during hurricanes.
Policy 11.16	Wetlands, Lakes, and Floodplains - While the City may generally map wetlands, lakes, and floodplains within its corporate limits using National Wetlands Inventory maps and similar tools, their locations as identified within this Plan are preliminary and may change at the time of a State or Federal agency jurisdictional determination. Furthermore, the City relies upon regulatory agency specialists to identify, designate, exercise, and enforce regulations of natural resources, including mitigation requirements. It is the applicant's responsibility to obtain a site-specific survey which indicates the jurisdictional limits, quality, and function of the resource. Development of wetlands, lakes, and floodplains within the Auburndale Green Swamp Protection Area shall conform to the following criteria: a) No new lots shall be created which are entirely within a jurisdictional wetland or 100- year floodplain. b) An undisturbed 25-foot-wide native vegetative buffer shall be maintained from the ordinary high-water line of any lake. c) Jurisdictional wetlands, lakes, and 100-year floodplains are designated Environmentally Sensitive Lands. d) Development shall cluster in non-wetland and non-floodplain areas.

TABLE III-2:
CITY OF AUBURNDALE POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
	e) The applicant shall provide assurances that the development will be directed away from wetlands and conducted in a manner to protect the vegetation, habitat, water storage, water quantity, water quality, and recharge functions of wetlands. f) Controlled burns, fire lanes, silviculture, and ecosystem restoration and maintenance are permissible activities in wetlands provided they are performed in accordance with Best Management Practices. But for the provisions of this section, wetlands shall be maintained in their natural and unaltered state. g) Development shall designate natural buffers averaging 25 feet in width but not less than 15 feet from the landward extent of jurisdictional wetlands. Wider setbacks may be imposed by the City if warranted by the wetlands' environmental sensitivity and the intensity of the proposed development. h) Natural buffers averaging 25 feet in width but in no case less than 15 feet shall be maintained upland of the 100-year floodplain. i) No development shall be permitted within a wetland unless authorized or exempted by the Florida Department of Environmental Protection, the U.S. Army Corps of Engineers, the Southwest Florida Water Management District, and the policies of this Comprehensive Plan. j) Consideration of wetland impacts shall include, but not necessarily be limited to, the following circumstances where no reasonable alternative exists: (1) access to the site. (2) internal traffic circulation. (3) utility lines. (4) pretreated stormwater and floodplain management. (5) public safety. (6) mining that meets State and Federal regulations. (7) to avoid precluding all beneficial use of the property. k) Where impacts to wetlands, floodplains, and the associated buffers of each cannot be avoided, the developer must demonstrate: (1) maximum utilization of uplands.

TABLE III-2:
CITY OF AUBURNDALE POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
	(2) that there is no other reasonable, practical, or economical alternative; and (3) that without the proposed activity the property owner will be deprived of all reasonable uses of the property. l) The applicant must provide a narrative illustrating the degree to which wetland avoidance and minimization were undertaken in the project design. All wetland impacts shall be offset by agency-approved mitigation to be performed within the Green Swamp. m) Particular attention in the project design evaluation will be paid to those wetlands occurring in conjunction with other Environmentally Sensitive Lands, particularly habitats known to support State or Federally listed species. n) Structures in wetlands shall be placed in a manner that will not adversely affect the natural flow regime and not reduce aquifer recharge capabilities. Placement of structures shall be consistent with sound floodplain management practices. o) Where impacts to wetlands cannot be avoided, all agency permits with jurisdiction shall be approved prior to the issuance of a development order. An "intent to issue a final Development Order" may be issued in writing prior to the issuance of said order if pre-approval is required by an agency with jurisdiction. p) Activities permitted to encroach into native vegetative wetland buffers include the following: (1) agriculture and silviculture (2) passive recreation (3) irrigation systems (4) native species planting including mitigation or habitat restoration (5) utility lines (6) pretreated stormwater and floodplain management (7) boardwalks, docks, or trails (8) ramps for lake access q) Development shall not alter the natural function of the floodplain. r) Development shall not enlarge the off-site floodplain.

TABLE III-2:
CITY OF AUBURNDALE POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
	s) Development shall not result in post development run-off rates which exceed pre- development run-off rates for storm frequencies at least as stringent as those rates established by SWFWMD. t) Encroachment, including fill, new construction, substantial improvements, and other development, shall be prohibited within the floodplain unless certification (with supporting technical data) by a registered professional engineer is provided demonstrating that encroachments shall not result in any increase in flood levels during occurrence of the 100-year base-flood discharge. u) The extent of lakes shall be defined by their Ordinary High-Water Line (OHWL). v) Floodplain Assessment. A detailed flood insurance study shall be performed for all subdivision proposals and other proposed development having five (5) acres or more in the 100-year floodplain. The construction of a single-family dwelling on a parcel containing five (5) or more acres which is not part of a subdivision or which is part of a subdivision in existence on the effective date of this plan is exempt from this requirement. Phases of a larger development, if the larger development meets the five (5) acre criterion, are not exempt from this requirement. If existing subdivisions are proposed for replatting, the replatted portion shall be required to comply with this requirement if the replatted portion meets the five (5) acre criterion. Subdivisions which contain 10 lots or less shall be exempt from these requirements. The study shall be performed in accordance with the Flood Insurance Study Guidelines and Specifications for Flood Contractors (FEMA Publication 37). w) Projects or portions of projects in Most Effective Recharge Areas must retain three inches of runoff from directly connected impervious areas within the project. Applicants may instead demonstrate that the-post-development recharge will be equal to or greater than the pre-development recharge. Most Effective Recharge Areas are those areas with soils classified by the Soil Conservation Service as Type "A" Hydrologic Soil Group. Directly connected impervious areas are those impervious areas which are connected to the surface water management system by a drainage

TABLE III-2:
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Source (Document, Number, Chapter, Section)	Text/Description
	improvement such as a ditch, storm sewer, paved channel, or other man-made conveyance. Stormwater that is retained must be infiltrated into the soil or evaporated such that the storage volume is recovered within 14 days following a storm event.
Comprehensive Plan – Infrastructure Element	
Policy 3.3	Stormwater management facilities shall be designed to accommodate the 25-year, 24-hour design storm to meet the water quality and quantity standards that follow: a: Water Quantity: Peak post-development runoff shall not exceed peak pre-development runoff rates. b: Water Quality: Water Quality: Treatment of stormwater runoff shall be required for all development, redevelopment and, when expansion occurs, existing developed areas. The stormwater treatment system or systems can be project specific, serve sub-areas within the City or be a system to serve the entire City. Regardless of the area served and in accordance with Chapter 62-25, F.A.C., the stormwater treatment systems must provide a level of treatment for the runoff from the first one (1) inch of rainfall for projects in natural drainage basins of 100 acres or more, or as an option, for projects or project subunits in natural drainage basins of less than 100 acres, the first one-half (1/2) inch of runoff, from the design storm in accordance with Rule 62-25, F.A.C. in order to meet the receiving water quality standards of Rule 17-302, section 17-302.500, F.A.C. Stormwater discharge facilities shall be designed so as to not lower the receiving water quality or degrade the receiving water body below the minimum conditions necessary to maintain their classifications as established in Chapter 17-302, F.A.C. It is intended that all standards in these citations are to apply to all development and redevelopment and that any exemptions or exceptions in these citations, including project size thresholds, do not apply for concurrency determinations. Infill residential development within improved residential areas or subdivisions existing prior to the adoption of this comprehensive plan, must ensure that its post-development stormwater runoff will not

TABLE III-2:
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Source (Document, Number, Chapter, Section)	Text/Description
	contribute pollutants which will cause the run-off from the entire improved area or subdivision to degrade receiving water bodies and their water quality as stated above.
Objective 7 Protection of Natural Drainage Features and Man-made Drainage Structures	Protect natural drainage features, man-made drainage structures and the City's lakes from receiving stormwater runoff that could degrade water quality in the City or downstream from the City.
Policy 7.7	The City shall not extend stormwater management facilities to new areas if such an extension would exceed the present ability of the City to provide protection from flooding to presently served areas, consistent with the established level of service standard for new stormwater management facilities.
Comprehensive Plan – Intergovernmental Coordination Element	
Policy 5.6	The City will enter into an interlocal agreement with Polk County for joint projects identified in the City's stormwater management plan and the County's Stormwater Management Plan.
Land Development Regulations – Chapter 5 Zoning	
Sec. 5.2.8 LOCATION OF STRUCTURES NEAR BODIES OF WATER; 100 YEAR FLOOD LEVEL.	5.2.8.1. No building or structure, other than a boat house or dock, shall be erected within 50 feet of the shoreline of any lake or other body of water which has a width of 10 feet or greater at its normal water level. 5.2.8.2. For purposes of the Land Development Regulations, normal water level and 100 year flood levels shall be considered to be those established on the Flood Insurance Rate Maps.
Land Development Regulations – Chapter 8 Environmental Protection	
Sec. 8.1.1 PURPOSE	The City is committed to the protection of environmental resources through the adoption of the Comprehensive Plan and more specifically the adoption of the Conservation Element of the Plan. Some of the issues addressed in this Element include surface water, water wells, lakes, fisheries and wetlands. Other issues contained in the Element are addressed as appropriate in other Chapters of the Land Development Regulations. This Chapter provides the regulations necessary to implement stormwater management systems, water well protection, impervious surface coverage, and protection of lakes, wetlands, threatened or endangered species habitat, conservation area, native ecological communities and water shortages.

TABLE III-2:
CITY OF AUBURNDALE POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
Chapter 14 Flood Protection Sec. 14.1.1 General	These regulations shall be known as the Floodplain Management Chapter of the City of Auburndale Land Development Regulations, hereinafter referred to as "this chapter or these regulations." 14.1.1.2 INTENT. The purposes of this chapter and the flood load and flood resistant construction requirements of the Florida Building Code are to establish minimum requirements to safeguard the public health, safety, and general welfare and to minimize public and private losses due to flooding through regulation of development in flood hazard areas.

TABLE III-3:
CITY OF BARTOW POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
Comprehensive Plan – Future Land Use Element	
Policy 1.2.1	The City will approve the location of new development on the basis of the suitability of the land to support development without adversely affecting the natural environment resources, potable water well protection areas and environmentally sensitive land, through the use of a development review process and appropriate mitigation measures. Specifically, the densities and intensities of land uses in wetlands, flood prone areas, and areas with severe soil limitations to development shall be as follows: a. In the isolated wetlands shown on the Future Land Use Map, low density residential land uses shall be limited to one dwelling units per ten acres for all development and redevelopment; only passive recreation facilities shall be permitted and they shall be limited to a floor area ratio of 0.01; and all other public facilities, buildings and grounds shall be limited to a floor area ratio of 0.10. All other uses, specifically all nonresidential uses, shall be prohibited. All future wetlands annexed into the City of Bartow that are 10 acres or more in size shall be classified as either Conservation or Recreation and Open Space Land Use on the Future Land Use Map. Wetland areas less than 10 acres in size on any parcel do not need to be shown on the Future Land Use Map unless the area is part of a larger contiguous system, when combined, totals 10 acres or more in size. Areas less than 10 acres in size will be delineated at the time of development and are subject to the same protection standards and guidelines applicable to the wetland areas shown on the Future Land Use Map. Any proposed development within isolated wetlands shall be evaluated as to its impacts on wetland species and natural systems consistent with State and Federal permitting procedures. Land uses in future wetlands shall be restricted to the density and intensity standards stated above. b. All future flood plains annexed into the City of Bartow that are 10 acres or more in size shall be designated either Conservation or Recreation and Open Space on the Future Land Use Map. Floodplain areas less than 10 acres in size on any parcel do not need to be shown on the Future Land Use Map unless the area is part of a larger contiguous system, when combined, totals 10 acres or more in size. Areas less than 10 acres in size will be delineated at the time of development and are subject to the same protection standards and guidelines applicable to the floodplain areas shown on the Future Land Use Map. Any proposed development within the 100-year floodplain shall be evaluated as to its impacts on flood storage and capacity, as well as any impacts to natural

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Source (Document, Number, Chapter, Section)	Text/Description
	resources. All development and redevelopment of permitted uses and facilities shall be set back 100 feet from the natural bank of the Peace River, flood proofed, and the first floor elevation shall be one foot above the elevation of the 100-year flood. No development or redevelopment shall undertake any activity that will reduce the capacity, alter the flow characteristics of the Peace River, or otherwise degrade the functions of the floodplain. c. The density and intensity of land uses shown in areas with severe soil limitations are established in Objective 5 and supporting policies of this Element. Severe soils do not alone, constitute reason to reduce densities and intensities established for land uses by Objective 5. Map 4, page 15 serves as a statement of limitations that may affect the development capacity of a particular site. The City shall require specific soils analysis and may impose additional construction standards in such areas. d. Environmentally sensitive lands shall be defined as high aquifer recharge areas, public supply potable water wellfield protection areas, wetlands, floodplains, Areas of Critical State Concern as defined by Chapter 380, F.S., and Natural Resources of Regional Significance, as delineated in the Strategic Regional Policy Plan of the Central Florida Regional Planning Council. These areas shall be protected through the application of the City's zoning and site plan review regulations, which shall regulate the density and intensity of use, and shall incorporate techniques such as cluster development to protect these resources. Residential densities in areas of 100-Year floodplains shall not exceed 1 dwelling per 5 acres.
Objective 1.9: Coordination with the Objectives and Programs in the Polk County Hazard Mitigation Strategy; and Coordination with Chapter 380 Plans	The City shall coordinate Future Land Use designations with the County and surrounding municipalities to eliminate or reduce development in areas identified as having repetitive loss due to natural hazards and which are identified in the Polk County Hazard Mitigation Strategy; and the City shall coordinate with any resource planning and management plan prepared pursuant to Chapter 380.
Policy 1.9.1:	The City, through the implementation of its Land Development Regulations, will ensure that development approvals are consistent with the objectives and policies of the Polk County Hazard Mitigation Strategy, August 1999, as amended. In so doing, the City shall specifically limit the extension of infrastructure to areas of repetitive loss due to natural hazards, especially within any 100-year floodplain or wetland area.

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Source (Document, Number, Chapter, Section)	Text/Description
Comprehensive Plan – Infrastructure Element	
Policy 3.3	Stormwater management facilities shall be designed to accommodate the 25 year, 24-hour design storm to meet the water quality and quantity standards that follow: a: Water Quantity: Peak post-development runoff shall not exceed peak pre-development runoff rates. b. Water Quality: Treatment of stormwater runoff shall be required for all development, redevelopment, and, when expansion occurs, existing developed areas. The stormwater treatment system or systems can be project specific, serve sub-areas within the City, or be a system to serve the entire City. Regardless of the area served and in accordance with Chapter 17-25, F.A.C., the stormwater treatment systems must provide a level of treatment for the runoff from the first one (1) inch of rainfall for projects in natural drainage basins of 100 acres or more, or as an option, for projects or project subunits in natural drainage basins of less than 100 acres, the first one-half (1/2) inch of runoff, from the design storm in accordance with Rule 17-25, F.A.C. in order to meet the receiving water quality standards of Rule 17-302, section 17-302.500, F.A.C. Stormwater discharge facilities shall be designed so as to not lower the receiving water quality or degrade the receiving water body below the minimum conditions necessary to maintain their classifications as established in Chapter 17-302, F.A.C. It is intended that all standards in these citations are to apply to all development and redevelopment and that any exemptions or exceptions in these citations, including project size thresholds, do not apply for concurrency determinations. Infill residential development within improved residential areas or subdivisions existing prior to the adoption of this Comprehensive Plan, must ensure that its post-development stormwater runoff will not contribute pollutants which will cause the run-off from the entire improved area or subdivision to degrade receiving water bodies and their water quality as stated above.

TABLE III-3:
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Source (Document, Number, Chapter, Section)	Text/Description
OBJECTIVE 6: PROTECTION OF NATURAL DRAINAGE FEATURES AND MAN-MADE DRAINAGE STRUCTURES	PROTECT NATURAL DRAINAGE FEATURES, MAN-MADE DRAINAGE STRUCTURES (THE CITY'S LAKES) AND THE PEACE RIVER FROM RECEIVING STORMWATER RUNOFF THAT COULD DEGRADE WATER QUALITY IN THE CITY OR DOWNSTREAM FROM THE CITY.
Policy 6.4	The City shall regulate stormwater run-off for new development through the enforcement of performance standards for design and treatment of stormwater facilities at least as stringent as those specified in Section 17-25, F.A.C.
Policy 6.5	The City shall continue to participate in the Federal Flood Insurance Program.
Policy 6.8	The City shall correct all identified stormwater management facility deficiencies. Deficiencies for existing development shall be defined as inability to manage a 25-year 24 hour storm event or contributing to the degradation of the receiving body below minimum conditions necessary to assure the suitability of water for the designated use of its classification as established in Chapter 17-3, F.A.C. The expenditure of public funds on stormwater management facility improvements shall be prioritized as follows: to fulfill legal obligations; to prevent further degradation of surface or water bodies; to provide adequate stormwater management facilities for existing development in the City; to provide adequate stormwater management for new development in the City; and to extend municipal stormwater management facilities to areas outside of the City.
Policy 6.10	The City shall not extend stormwater management facilities to new areas if such an extension would exceed the present ability of the City to provide protection from flooding to presently served areas, consistent with the established level of service standard for new stormwater management facilities.
Comprehensive Plan – Conservation Element	
Policy 2.4	The City will restrict uses in the wellhead protection zone. When funds become available through the Southwest Florida Water Management District or another agency with jurisdiction, the City will request funding assistance to identify cones of influence for all of its wellheads and extend protection measures to those areas.
Policy 6.3	Jurisdictional wetlands and 100-year floodplain areas within the City's jurisdiction are recognized as "environmentally sensitive lands." These areas that are 10 acres or more in size shall be designated Conservation or Recreation and Open Space on the Future Land Use Map. These areas less than 10 acres on any parcel do not need to be shown on the Future Land

TABLE III-3:
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	Use Map unless the area is part of a contiguous system, when combined, totals 10 acres or more in size. Areas less than 10 acres in size will be delineated at the time of development and are subject to the same protection standards and guidelines applicable to the wetland and floodplain areas shown on the Future Land Use Map. The hydrologic functions and habitat characteristics of jurisdictional wetlands and 100-year floodplain areas shall be protected through the enforcement of land development regulations, including zoning, site plan review, buffer zones, minimum setback requirements, regulation and prohibition of certain uses, and stormwater treatment regulations. The areas designated as Conservation or Recreation and Open Space pursuant to this policy and applicable policies in the Future Land Use Element shall serve as conceptual indicators of wetlands and/or 100-year floodplain areas. The precise delineation of these areas shall be determined through site-specific studies and field determinations which assess the extent of wetland and floodplain areas consistent with State and Federal permitting procedures. Alterations to jurisdictional wetlands and 100-year floodplain areas are regulated through the State and Federal permitting process.
Policy 6.4	The hydrologic functions of the 100-year floodplain shall be protected.
Comprehensive Plan – Intergovernmental Coordination Element	
Policy 5.6	The City will enter into an interlocal agreement with Polk County for joint projects identified in the City's Stormwater Management Plan and the County's Stormwater Management Plan.
Comprehensive Plan – Capital Improvements Element	
Policy 2.5	Stormwater management facilities shall be designed to accommodate the 25-year, 24-hour design storm to meet the water quality and quantity standards that follow: a. Water Quantity: Peak post-development runoff shall not exceed peak pre-development runoff rates. b. Water Quality: Treatment of stormwater runoff shall be required for all development, redevelopment and, when expansion occurs, existing developed areas. The stormwater treatment system or systems can be project specific, serve sub-areas within the City or be a system to serve the entire City. Regardless of the area served and in accordance with Chapter 62-25, F.A.C., the stormwater treatment systems must provide a level of treatment for the runoff from the first one (1) inch of rainfall for projects in natural drainage basins of 100 acres or more, or as an option, for projects or project subunits in natural drainage basins of

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Source (Document, Number, Chapter, Section)	Text/Description
	less than 100 acres, the first one-half (1/2) inch of runoff, from the design storm in accordance with Rule 62-25, F.A.C. in order to meet the receiving water quality standards of Rule 62-302, section 62-302.500, F.A.C. Stormwater discharge facilities shall be designed so as to not lower the receiving water quality or degrade the receiving water body below the minimum conditions necessary to maintain their classifications as established in Chapter 62-302, F.A.C. It is intended that all standards in these citations are to apply to all development and redevelopment and that any exemptions or exceptions in these citations, including project size thresholds, do not apply for concurrency determinations. Infill residential development within improved residential areas or subdivisions existing prior to the adoption of this comprehensive plan, must ensure that its post-development stormwater runoff will not contribute pollutants which will cause the run-off from the entire improved area or subdivision to degrade receiving water bodies and their water quality as stated above.
Policy 2.6	The City establishes a stormwater management level of service for existing development equal to a 3-year, 24-hour storm event. Stormwater will be handled by, and contained within existing stormwater management facilities.
Land Development Regulations - Article 3 Development Design and Improvement Standards	
3.05.00 Stormwater Management.	Treatment of stormwater runoff shall be required for all development, redevelopment and, when expansion occurs, existing developed areas. The stormwater treatment system or systems can be project specific, or serve sub-areas within the County. The design and performance of all stormwater management systems shall comply with applicable State Regulations, Chapter 17-25 and Chapter 17-302, Florida Administrative Code; and the rules of the SWFWMD stated in Chapter 40D-4, F.A.C; and with this section of the Code, which implements the City's ordinance and Polk County Ordinance 93-06. Stormwater discharge facilities shall be designed so as to not lower the receiving water quality or degrade the receiving water body below the minimum conditions necessary to maintain their classifications as established in Chapter 17-302, F.A.C. Steps to control erosion and sedimentation shall be taken for all development.

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Source (Document, Number, Chapter, Section)	Text/Description
3.05.01 Stormwater Management Requirements	The contribution of pollutants through discharges from storm sewer systems has a significant impact on the receiving waters in Polk County. Improperly treated discharges from industrial activities and interconnected Municipal Separate Storm Sewer Systems (MS4's) and illicit discharges from spilling, dumping or disposal of material other than stormwater to the municipal separate storm sewer system will adversely affect the quality of waters receiving such discharges. The EPA, pursuant to Title 40, Section 122.26 of the Code of Federal Regulations, has mandated that municipalities provide the legal authority to control discharges to the municipal separate storm sewer system under the National Pollutant Discharge Elimination System (NPDES) in order to control the quality of discharges from the MS4. The City Commission of the City of Bartow therefore finds it necessary and in the public interest, to protect the quality of waters receiving stormwater discharges from becoming contaminated, for the health, safety, and general welfare of the citizens of the City. (A) Control of Stormwater Discharges (1) Stormwater Discharges to the Municipal System and U.S. Waters. The discharge of stormwater to an MS4 shall be controlled to the extent that such discharge will not impair the operation of the MS4 or contribute to the failure of the MS4 to meet any State or Federal requirements. Discharges to waters of the U.S. shall be controlled to the extent that the discharge will not adversely impact the quality or beneficial uses of the receiving water. Any person responsible for stormwater discharges determined by the municipality to be contributing to the impairment of the waters of the U.S., either directly or through an MS4, shall provide corrective measure in accordance with a schedule approved by the municipality. (2) Stormwater Discharges from Industrial Activities and Construction Sites. Stormwater from construction sites shall be controlled in such a way as to retain sediment on-site and prevent violations of State water quality standards. All erosion and sediment controls required pursuant to the pollution prevention plan of a NPDES stormwater permit for construction or required pursuant to a State stormwater permit issued by either the FDEP or appropriate water management district shall be properly

TABLE III-3:
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Source (Document, Number, Chapter, Section)	Text/Description
	implemented, maintained and operated. The minimum acceptable requirements for construction sites are set forth in Appendix B, Best Management Practices (BMP's) for Construction Activities, attached at the back of the Code. Stormwater from areas of industrial activity shall be treated or managed on-site, using best management practices, prior to discharging to an MS4 or to U.S. Waters. All stormwater discharges from the site shall be of a quality which will not adversely impact the water quality or beneficial uses of the receiving water. The owners of industrial facilities or constructions sites which will discharge stormwater to an MS4, must provide written notification to the appropriate municipality prior to discharging. (3) Control of Pollutant Contributions from Interconnected MS4's. The discharge of stormwater between interconnected State, County or other municipal storm sewer systems shall not impair the quality of the discharge from the receiving storm sewer system. Owners of sections of an interconnected MS4 shall be responsible for the quality of discharge from their portion of the system and shall coordinate with the owners of the downstream segments prior to initiating any modifications to the system. (B) Control of Non-Stormwater Discharges. Any discharge, other than stormwater, to an MS4 or to waters of the U.S. which is not exempt under Section 3.05.01(D) is considered an illicit discharge and is prohibited. Upon discovery of an illicit discharge, persons responsible for the discharge shall report their findings immediately to the City. Persons responsible for illicit discharges shall immediately, upon notification, initiate procedures to cease discharging or provide suitable containment facilities until modifications are made to properly treat the discharge, or a NPDES permit is obtained. Such procedures shall include a requirement to obtain approval of a schedule for implementing proposed corrective measures from the City. (C) Inspection and Maintenance of Systems. City personnel shall be granted access for inspection of facilities discharging or suspected of discharging to an MS4 or waters of the U.S. in order to evaluate the potential for release of materials other than stormwater. All

TABLE III-3:
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Source (Document, Number, Chapter, Section)	Text/Description
	structures which allow discharges to an MS4 shall be made accessible to municipal personnel for continual monitoring of the quality of the discharges. Structural controls and other BMP's used to reduce pollutants in stormwater discharges shall be operated and maintained so as to function in accordance with the original design or performance criteria. Operation and maintenance shall be done so as to assure treatment of stormwater or reduction in pollutants in stormwater discharges consistent with appropriate Federal, State or Water Management District rules or permit requirements. (D) Variances and Exemptions. Variances from specific requirements of this Code shall be considered on a case by case basis to the extent that granting of such variance will not adversely impact the quality of the receiving water or relieve a person from any Federal, State or local requirements which may apply. Notification of variance application shall be provided to the owners of all MS4's within the City.
Land Development Regulations - Article 5 Resource Protection Standards	
5.01.00 Development in Flood-Prone Areas 5.01.01 Purpose and Intent	It is the purpose and intent of this Section to promote the public health, safety and general welfare and to minimize public and private losses due to flood conditions in specific areas. This Section shall apply to all areas of special flood hazard within the jurisdictional boundaries of the City of Bartow. No structure or land shall hereafter be located, extended, converted or structurally altered without full compliance with the terms of this Section and other applicable regulations. Areas of special flood hazard that have been or may be identified on a Flood Insurance Rate Map (FIRM), published by the Federal Emergency Management Agency (FEMA), and any revisions thereto, are adopted by reference and declared to be a part of this Section. In the absence of FIRMs and supporting data, areas of special flood hazard shall be identified by field analysis until such FIRMs are available. These flood hazard management regulations do not repeal, abrogate, or impair any existing easements, covenants, or deed restrictions. Although the degree of flood protection required by this Section is reasonable and appropriate for regulatory purposes, based on scientific

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	and engineering considerations, more severe floods will occur, and flood heights may be increased by man-made or natural causes. Consequently, this Section is not intended to imply that land outside the areas of special flood hazard or uses permitted within those areas will be free from flooding or flood damages. This Section shall not create liability on the part of the City or any of its officers or employees for any flood damages that result from reliance on these flood hazard management regulations or any administrative decision lawfully made thereunder.
5.01.101.03 Intent.	The purposes of this ordinance and the flood load and flood resistant construction requirements of the Florida Building Code are to establish minimum requirements to safeguard the public health, safety, and general welfare and to minimize public and private losses due to flooding through regulation of development in flood hazard areas.
Land Development Regulations – Article 6 Public Facility Monitoring and Permitting	
6.01.07.02 Adequacy of Stormwater Management.	The proposed development shall be designed to provide adequate areas and easements for the construction and maintenance of a water management system to serve the proposed development and adjacent public rights of way in a manner that conforms to sound engineering standards. The development order shall require that the applicant meet the following LOS standards, where applicable, prior to any plan approval. (A) Road Protection. Residential streets having not more than fifty (50) feet of pavement width shall have crown elevations equal to the 100-year flood elevation. Rights of way having greater than fifty (50) feet of pavement width shall have a final edge of pavement elevation no lower than the 100-year flood elevation. (B) Buildings. The lower floor elevation for buildings shall be no lower than one foot above the 100-year elevation. (C) Off-Site Discharge. Off-site discharge is not to exceed the standards allowed by the SWFWMD and this Code. (D) Storm Sewers. The design frequency applicable to storm sewers is the 25-year, 24-hour storm event.

TABLE III-4:
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Source (Document, Number, Chapter, Section)	Text/Description
Comprehensive Plan – Future Land Use Element	
Objective 4	Beginning on the date of adoption of the Comprehensive Plan, the City shall protect the quality and quantity of its natural and historic resources. This shall be accomplished through the enforcement of Land Development Regulations and through the Development Review Process.
Policy 4.6	The City shall include in its Land Development Regulations standards for proposed development to provide for equivalent storage of stormwater in order to prevent other areas from flooding.
Objective 6	The City shall manage future growth through enforcement of Land Development Regulations. Land Development Regulations shall include provisions for the use of innovative land development techniques that provide the most efficient use of city resources
Policy 6.1	The City shall adopt Land Development Regulations to ensure that future uses are consistent with the Future Land Use map or map series and to provide compatibility between different land use intensities. Land Development Regulations shall, at a minimum: d) Regulate land development in areas subject to seasonal or periodic flooding and provide for drainage and stormwater management.
Comprehensive Plan – Infrastructure Element	
Policy 1.1.5	The City shall adopt development standards which prohibit the location of new septic systems in wetlands, floodplains, and areas containing soils with "severe" limitations or which do not pass percolation tests conducted by the Department of Health. Existing septic systems located in areas with severe soil limitations may be maintained or replaced to provide more efficient wastewater treatment.
GOAL 4	TO ENSURE THE PROPER MANAGEMENT OF THE QUANTITY AND QUALITY OF STORMWATER RUNOFF.
OBJECTIVE 4.1	THE CITY SHALL MANAGE THE QUALITY AND QUANTITY OF STORMWATER RUNOFF. EXISTING DEFICIENCIES IN MAN-MADE OR ALTERED NATURAL DRAINAGE FACILITIES SHALL BE CORRECTED. NEW DEVELOPMENT SHALL BE REQUIRED TO ADEQUATELY MANAGE STORMWATER RUNOFF. THE FUNCTIONS OF NATURAL DRAINAGE FEATURES SHALL BE PROTECTED THROUGH ENFORCEMENT OF LAND DEVELOPMENT REGULATIONS.
Policy 4.1.7	The volume of stormwater runoff to be treated for a site shall be determined by the type of treatment system. A wet detention treatment system shall treat one inch of runoff from the contributing area. Detention with an effluent filtration system (manmade underdrains), on-line and offline treatment systems shall treat runoff from the first one inch of

TABLE III-4:
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Source (Document, Number, Chapter, Section)	Text/Description
	rainfall; or as an option for projects or project subunits with drainage areas less than 100 acres, the first one-half inch of runoff. In determining the runoff from one inch of rainfall, calculations must be provided to determine the runoff from the directly connected impervious areas separately from any other contributing areas.
Policy 3.2	In order to minimize the impact of on-site wastewater disposal systems on the quality of surface water and groundwater, the City shall enforce development standards which prohibit the location of new septic systems in wetlands, floodplains and areas containing soils with "severe" limitations or which do not pass percolation tests conducted by the State of Florida. Existing septic systems located in areas with severe soil limitations may be maintained or replaced to provide more efficient wastewater treatment.
OBJECTIVE 4	THE CITY SHALL INCLUDE IN ITS LAND DEVELOPMENT REGULATIONS, DEVELOPMENT STANDARDS AND MITIGATION PROCEDURES TO CONSERVE, APPROPRIATELY USE, AND PROTECT THE NATURAL FUNCTION OF FLOODPLAINS AND WETLANDS.
Comprehensive Plan – Intergovernmental Coordination Element	
Policy 5.6	The City will enter into an interlocal agreement with Polk County for joint projects identified in the City's Stormwater Management Plan and the County's Stormwater Management Plan.
Land Development Regulations – Article 2 – General Regulations for Zoning Districts	
SECTION 2.18.00 TEMPORARY MANUFACTURED HOME, RECREATIONAL VEHICLE, OR TINY HOUSE FOR USE DURING POST-DISASTER RELIEF.	During post-disaster rehabilitation or reconstruction of a single-family dwelling made unfit for human habitation, the Development Director or Building Official may authorize the use of temporary emergency housing on a single-family parcel for temporary occupancy by residents of the same parcel who have been displaced by natural or manmade disaster damage such as fire, flood, or hurricane, regardless of the zoning district requirements, subject to the following conditions:
Land Development Regulations – Article 8 – Natural Resource Protection	
SECTION 8.01.00 GENERAL	The City is committed to the protection of environmental resources through the adoption of the Comprehensive Plan and more specifically the adoption of the Conservation Element of the Plan. Some of the issues addressed in the Conservation Element include floodplains, surface water, ground water, lakes, and wetlands. This Article provides the regulations necessary to implement flood protection, water well protection, impervious surface overage, and protection of lakes and wetlands; threatened or endangered species habitat, conservation area, native ecological communities, and water shortages.

TABLE III-4:
CITY OF DAVENPORT POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
SECTION 8.02.00 FLOOD PROTECTION	The City of Davenport has participated in the National Flood Insurance Program (NFIP) since December 2, 1980. To remain compliant with the National Flood Insurance Program, the City is required to adopt requirements consistent with Title 44 Code of Federal Regulations, Sections 59 and 60. Davenport's adopted flood control and drainage requirements are located in the Code of Ordinances, Chapter 8, Flood Control and Drainage.

TABLE III-5:
TOWN OF DUNDEE POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
Comprehensive Plan – Future Land Use Element	
Policy 1.2	The adopted Land Development Regulations shall regulate the use of land consistent with the Future Land Use Element and the Future Land Use Map Series, shall ensure the compatibility of adjacent land uses, and, at a minimum, shall: d) Regulate land development in areas subject to periodic flooding and provide for drainage and stormwater management;
OBJECTIVE 3: PROTECTION OF NATURAL, HISTORICAL, AND CULTURAL RESOURCES	TO THE MAXIMUM EXTENT POSSIBLE, PROTECT NATURAL, HISTORICAL, AND CULTURAL RESOURCES FROM THE NEGATIVE IMPACTS OF DEVELOPMENT AND REDEVELOPMENT.
Policy 3.2	The Town of Dundee shall require that all development proposals be accompanied by evidence that an inventory of wetlands; soils posing severe limitations to construction; unique habitat; endangered species of wildlife and plants; and areas prone to periodic flooding has been conducted. The Town shall further require that the extent to which any development or redevelopment is proposed to be placed in/on, to disturb, or to alter the natural functions of any of these resources be identified. Such identification shall occur at a phase in the development review process that provides the opportunity for the Town to review the proposed project to ensure that direct and irreversible impacts on the identified resources are minimized, or in the extreme, mitigated. Where development is determined to encroach upon a resource, the Town shall require a specific management plan to be prepared by the developer, which results in no net loss of wetlands and which includes necessary modifications to the proposed development, specific setback and buffers, and clustering of development away from site resources, to ensure the protection, preservation or natural functions of the resource. Where mitigation is approved by appropriate State or Federal agencies, wetlands shall be replaced with the same type and form that perform the same function as the wetland lost to development. Residential development in wetlands is permitted at a density not greater than one dwelling unit per five acres (1 du/5 ac). The minimum setback shall be 25 feet and the average of all setbacks from the resource shall be 40 feet. Development shall always be clustered away from wetlands on the upland portion of the site. Where no upland exists, development may occur so long as all applicable environmental permit requirements can be satisfied.

TABLE III-5:
TOWN OF DUNDEE POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
	All future subdivision of land shall contain adequate uplands for the permitted use. Areas designated as buffers shall preserve all-natural vegetative cover, except where drainage-ways and access paths are approved to cross the buffer. Buffers may be supplemented only with native trees, shrubs and ground covers. Final development orders shall be contingent upon implementation of every aspect of the approved management plan, which plan shall be consistent with all-natural resource protection policies of the Conservation Element of this Plan.
Policy 3.3	The Town of Dundee shall enforce the 150-foot radius interim zone of protection for each public supply potable water wellfield within the Town's jurisdiction. Proposed land uses which are incompatible with the designated interim protection zones shall be disapproved. The use or storage of hazardous substances within these designated interim protection zones shall also be disapproved. The Town shall complete a detailed mapping of cones of influence for public supply potable water wellfields. Assistance from the SWFWMD and/or the FDER shall also be requested to accomplish this task.
Goal 4	Drainage – Manage the quantity and quality of stormwater runoff to prevent damage and loss due to flooding and degradation of water resources due to pollution loading.
Comprehensive Plan – Transportation Element	
Policy 5.2	The treatment of stormwater runoff shall be included as an integral component of all new roadway construction and reconstruction.
Comprehensive Plan – Infrastructure Element	
GOAL 4: DRAINAGE	MANAGE THE QUANTITY AND QUALITY OF STORMWATER RUNOFF TO PREVENT DAMAGE AND LOSS DUE TO FLOODING AND DEGRADATION OF WATER RESOURCES DUE TO POLLUTION LOADING. [9J-5.011(2)(A)]
Policy 4.1.2	For all new development and redevelopment, post-development peak-discharge volumes and runoff-rates shall not exceed the corresponding pre-development volumes and rates. All development requests, except those for individual single-family dwelling units on a lot of record, minor subdivisions, and minor commercial sites, shall be required to submit engineering plans, prepared by a professional engineer licensed to practice in Florida, for the purpose of providing evidence of compliance with this policy. Single-family dwelling units on existing lots of record, minor subdivisions, and minor commercial sites are not considered to pose a significant amount of adverse impacts with regard to stormwater

TABLE III-5:
TOWN OF DUNDEE POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
	runoff. However, this does not exempt them from meeting the Level of Service Standards for storm-water management.
Policy 4.1.3	The volume of stormwater runoff to be treated for a site shall be determined by the type of treatment system. A wet detention treatment system shall treat one inch of runoff from the contributing area. Detention with an effluent filtration system (manmade underdrains), on-line and offline treatment systems shall treat runoff from the first one inch of rainfall; or as an option for projects or project subunits with drainage areas less than 100 acres, the first one-half inch of runoff. In determining the runoff from one inch of rainfall, calculations must be provided to determine the runoff from the directly connected impervious areas separately from any other contributing areas.
Policy 4.1.4	Continue to inventory and evaluate drainage facilities, including natural and man-made drainage patterns and features.
Policy 4.1.5	Participate in the any proposed Polk County Stormwater Utility studies.
OBJECTIVE 4.2: EXPANSION OR INCREASE IN CAPACITY OF SYSTEM	EXPAND OR INCREASE THE MUNICIPAL DRAINAGE SYSTEM AS NEEDED TO MEET THE NEEDS OF FUTURE RESIDENTS AND BUSINESSES IN SUCH AS MANNER AS TO MAXIMIZE THE USE OF EXISTING FACILITIES AND DISCOURAGE URBAN SPRAWL.
Policy 4.2.1	Continue to implement the stormwater management plan that estimates and plans for future stormwater management needs while maximizing the use of existing facilities and limiting urban sprawl.
OBJECTIVE 4.3: PROTECTION OF NATURAL DRAINAGE FEATURES	REGULATE LAND USE AND DEVELOPMENT TO PROTECT THE FUNCTIONS OF NATURAL DRAINAGE WAYS THAT SERVE AS PRIMARY CONVEYANCE SYSTEMS FOR STORMWATER RUNOFF.
Policy 5.2.1	Proposed land uses which are incompatible with designated prime groundwater aquifer recharge areas shall be disapproved. The use or storage of hazardous substances within designated prime groundwater aquifer recharge areas shall be regulated through enforcement of the Town's Land Development Regulations.
Comprehensive Plan – Conservation Element	
Policy 1.3	As part of a stormwater management plan, prioritize which lakes, and which drainage facilities affecting those lakes, should receive drainage improvements. Consideration should be given to each lake's relative aesthetic and recreational value to the community and its need and potential for restoration or protection.

TABLE III-5:
TOWN OF DUNDEE POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
OBJECTIVE 3: FLOODPLAINS	PROTECT THE NATURAL HYDROLOGIC AND ECOLOGICAL FUNCTIONS OF FLOODPLAINS.
Policy 3.1	Dundee shall enforce the Town's Land Development Regulations that provide protection measures for floodplains from development activities. This shall be accomplished by: 1. Requiring new development to locate on non-sensitive portions of development site. 2. Requiring developers to adhere to applicable Southwest Florida Water Management District or Florida Department of Environmental Protection stormwater management standards. 3. Requiring the clustering of dwelling units away from sensitive portions of site. 4. Disapproval of proposed development which would fragment large ecological communities. 5. Requiring buffering of sensitive areas; and 6. The provision of conservation easements.
Policy 3.3	Dundee shall continue to designate 100-year floodplains as "environmentally sensitive lands" and protect them in accordance with the Goals, Objectives, and Policies of this Element.
Comprehensive Plan – Intergovernmental Coordination Element	
Policy 5.7	The Town will enter into an interlocal agreement with Polk County for joint projects identified in the Town's stormwater management plan and the County's Stormwater Management Plan.
Land Development Regulations - Article 5 Resource Protection Standards	
5.01.00 Development in Flood-Prone Areas 5.01.01 Purpose and Intent	It is the purpose and intent of this Section to promote the public health, safety and general welfare and to minimize public and private losses due to flood conditions in specific areas.
Sec. 44-169. - Stormwater management fund.	All stormwater drainage utility fees collected by the town shall be paid into a proprietary fund which is hereby created, to be known as the "stormwater management fund." Such fund shall be used for the purpose of paying the cost of the stormwater management facilities to be constructed in the various storm drainage basins and paying the cost of operation, administration and maintenance of the stormwater

TABLE III-5:
TOWN OF DUNDEE POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
	management facilities of the town. To the extent that the stormwater drainage fees collected are insufficient to construct the needed stormwater management facilities, the costs of the same may be paid from such town funds as may be determined by the town commission, but the town commission may order the reimbursement of such fund if additional fees are thereafter collected. When the fund has surplus dollars on hand in excess of current needs, the surplus dollars will be invested to return the highest yield consistent with proper safeguards and shall be available to be used exclusively for stormwater management expenditures.

TABLE III-6:
CITY OF EAGLE LAKE POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
Comprehensive Plan – Future Land Use Element	
Policy 1.1	The city shall enforce the adopted Land Development Regulations that contain provisions to implement the adopted Comprehensive Plan which will, at a minimum: c. Protect and regulate areas subject to seasonal and periodic flooding and provide for drainage and stormwater management.
Policy 1.2	The City shall revise its existing Land Development Regulations and adopt new provisions where needed to implement the Future Land Use Element and Map. These revised and new regulations shall address at a minimum, (3) regulation of lands subject to seasonal and periodic flooding.
Policy 3.3	The City shall designate on the Future Land Use Map Series, in the form of overlays or other graphic format, those natural resources such as water well fields and cones of influence, conservation and preservation areas identified as part of the Conservation Element, areas subject to flooding, lakes and soils.
Policy 3.5	The City of Eagle Lake shall enforce the protection standards established in the Land Development Regulations for the cones of influence for each public supply potable water wellfield within the City's jurisdiction. Proposed land uses which are incompatible with the designated interim protection zones shall be disapproved. The use or storage of hazardous substances within these designated interim protection zones shall also be disapproved. The City shall update the existing cones of influence map located in the Technical Support document and add the map to the Future Land Use Map series by December 2012. Assistance from the SWFWMD and/or the FDEP shall also be requested to accomplish this task.
Comprehensive Plan – Infrastructure Element	
OBJECTIVE 4.2	THE CITY SHALL CONTINUE TO PROMOTE THE PROPER DISPOSAL OF HAZARDOUS AND BIOHAZARDOUS MATERIALS.
GOAL 5	PROVIDE ADEQUATE PROTECTION OF EXISTING STORMWATER MANAGEMENT SYSTEMS AND RECEIVING WATER BODIES AND TO PROTECT THE NATURAL FUNCTION OF AQUIFER RECHARGE AREAS WITHIN THE CORPORATE LIMITS OF EAGLE LAKE AND TO ASSURE A SAFE AND AMPLE SUPPLY OF GROUNDWATER TO ITS RESIDENTS.
OBJECTIVE 5.1	THE CITY SHALL CONTINUE TO REGULATE STORMWATER DISCHARGES TO PREVENT FLOODING OF EXISTING AND PROPOSED STORMWATER FACILITIES.
Policy 5.1.5	Proposed land uses which are incompatible with designated prime groundwater aquifer recharge areas shall be disapproved. The use or

TABLE III-6: CITY OF EAGLE LAKE POLICIES AND REGULATIONS	
Source (Document, Number, Chapter, Section)	**Text/Description**
	storage of hazardous substances within designated prime groundwater aquifer recharge areas shall be regulated through enforcement of the City's Land Development Regulations.
Comprehensive Plan – Conservation Element	
Policy 1.2.2	Stormwater run-off from new developments shall be directed to retention systems that will provide treatment that meets FDEP and SWFWMD minimum requirements.
Policy 1.2.8	The City of Eagle Lake shall abide by the Florida Department of Environmental Protection Best Management Practices program which monitors point source discharges into lakes. The City shall adopt and enforce Land Development Regulations that require shoreline buffer zones adjacent to lakes to preserve natural vegetation, and general design and construction standards for on-site stormwater management systems for new development and redevelopment to ensure that post-development runoff rates, volumes, and pollutant loads do not exceed pre-development conditions.
OBJECTIVE 1.3: FLOODPLAINS	PROTECT THE NATURAL HYDROLOGIC AND ECOLOGICAL FUNCTIONS OF FLOODPLAINS DEVELOPMENT REGULATIONS THAT PROTECT THE NATURAL FUNCTIONS OF THE 100-YEAR FLOODPLAIN AROUND THE LAKES AND WITHIN WETLANDS WILL CONTINUE TO BE ENFORCED.
Policy 1.3.1	Eagle Lake shall adopt and enforce the City's Land Development Regulations that provide protection measures for floodplains from development activities. This shall be accomplished by: 1. Requiring new development to locate on non-sensitive portions of development site; 2. Requiring developers to adhere to applicable Southwest Florida Water Management District or Florida Department of Environmental Protection stormwater management standards. 3. Requiring the clustering of dwelling units away from sensitive portions of site. 4. Disapproval of proposed development which would fragment large ecological communities. 5. Requiring buffering of sensitive areas; and 6. The provision of conservation easements.

TABLE III-6:
CITY OF EAGLE LAKE POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
Comprehensive Plan – Capital Improvements Element	
Policy 3.4	The City shall not permit the use of small satellite water, wastewater, solid waste, and hazardous waste facilities by proposed developments by requiring, as part of the development approval process, that such facilities and services be provided only by the City or City/other local governments as applicable, primarily in appropriately located public centers.
Land Development Regulations – Division 7 - Environmental	
7.1.1.10 – Purpose and Intent	It is intended to establish an overlay zoning district designated as flood hazard (FH) districts and to depict such districts on the official zoning map. Flood hazard districts are declared to be areas subject to periodic inundation ranging from moderate to severe, and within such areas to regulate and restrict land uses in such a manner as to protect life and property, prevent or minimize damage, and reduce public costs for flood control and rescue and relief efforts occasioned by unwise use or occupancy of such areas.

TABLE III-7:
CITY OF FORT MEADE POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
Comprehensive Plan – Future Land Use Element	
Policy 8.1	The City shall enforce its land development regulations to encourage development techniques which mix and distribute land uses to accomplish the following: e) Regulate areas subject to periodic flooding.
Comprehensive Plan – Infrastructure Element	
Policy 1.4	The City will approve the location of new development on the basis of the suitability of the land to support such uses without adversely affecting natural resources, potable water wellhead protection areas, and environmentally sensitive land, using proper site plan review procedures and appropriate mitigation measures.
Policy 5.3	Stormwater management facilities shall be designed to accommodate the 25-year, 24-hour design storm to meet the water quality and quantity standards that follow: a) Water Quantity: Peak post-development runoff shall not exceed peak pre-development runoff rates. b) Water Quality: Treatment of stormwater runoff shall be required for all development, redevelopment and, when expansion occurs, existing developed areas. The stormwater treatment system or systems can be project specific, serve sub-areas within the City or be a system to serve the entire City. Regardless of the area served and in accordance with Chapter 17-25, F.A.C., the stormwater treatment systems must provide a level of treatment for the runoff from the first one (1) inch of rainfall for projects in natural drainage basins of 100 acres or more, or as an option, for projects or project subunits in natural drainage basins of less than 100 acres, the first one-half (1/2) inch of runoff, from the design storm in accordance with Rule 17-25, F.A.C. in order to meet the receiving water quality standards of Rule 17-302, section 17-302.500, F.A.C. Stormwater discharge facilities shall be designed so as to not lower the receiving water quality or degrade the receiving water body below the minimum conditions necessary to maintain their classifications as established in Chapter 17-302, F.A.C. It is intended that all standards in these citations are to apply to all development and redevelopment and that any exemptions or exceptions in these citations, including project size thresholds, do not apply for concurrency determinations.

TABLE III-7:
CITY OF FORT MEADE POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
	Infill residential development within improved residential areas or subdivisions existing prior to the adoption of this comprehensive plan, must ensure that its post-development stormwater runoff will not contribute pollutants which will cause the run-off from the entire improved area or subdivision to degrade receiving water bodies and their water quality as stated above.
Policy 5.4	No development permit will be issued if it will result in the inability of the City to maintain the Levels of Service at or above the levels established in this plan.
Policy 8.2	The City will enforce land development regulations to restrict land use activities which may adversely affect natural drainage features and man-made drainage structures. Submitted site plans shall include an identification and analysis of natural drainage features and man-made drainage structures, and the impacts of proposed development on drainage and topographic features.
Policy 8.3	The City shall regulate stormwater run-off for all new development through the enforcement of performance standards for design and treatment of stormwater facilities at least as stringent as those specified in Section 17-25, F.A.C.
Policy 8.4	The City shall continue to participate in the Federal Flood Insurance Program.
Policy 8.5	The City shall institute a program to remove sediments from retention/detention ponds as well as silt and vegetation from ditches and storm sewers to ensure the design capacity of these facilities is maintained. This Policy shall only be applicable to facilities owned or maintained by the City of Fort Meade.
Policy 8.6	The City shall correct all identified stormwater management facility deficiencies. Deficiencies for existing development shall be defined as the inability to manage a 25-year, 24 hour storm event, or contributing to the degradation of the receiving body below minimum conditions necessary to assure the suitability of water for the designated use of its classification as established in Chapter 17-3, F.A.C. The expenditure of public funds on stormwater management facility improvements shall be prioritized as follows: to fulfill legal obligations; to prevent further degradation of surface or water bodies; to provide adequate stormwater management facilities for existing development in the City; to provide adequate stormwater management for new development in

TABLE III-7:
CITY OF FORT MEADE POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
	the City; and to extend municipal stormwater management facilities to areas outside of the City.
Policy 8.7	The City shall ensure that stormwater management facility improvements requiring correction shall be included in the 5-Year Schedule of Capital Improvements (CIP).
Policy 8.8	The City shall not extend stormwater management facilities to new areas if such an extension would exceed the present ability of the City to provide protection from flooding to presently served areas, consistent with the established level of service standard for new stormwater management facilities.
Comprehensive Plan – Intergovernmental Coordination Element	
Policy 5.6	The City will enter into an Interlocal Agreement with Polk County for joint projects identified in the City's Stormwater Management Plan and the County's Stormwater Management Plan.
Policy 6.5	The City will coordinate with the Central Florida Regional Planning Council (CFRPC) to identify and protect Natural Resources of Regional Significance as identified in the CFRPC's Strategic Regional Policy Plan, October 1997. The City will cooperate with Florida Department of Environmental Protection (FDEP) and CFRPC to identify and include greenways and an integrated habitat network of uplands on all planning maps. The City will adopt goals and objectives for protection of the Peace River and its wetlands and floodplains, as recommended by the Charlotte Harbor National Estuary Program board and continue to participate by attending advisory board meetings.
Comprehensive Plan - Capital Improvement Element	
Policy 2.3	Stormwater management facilities shall be designed to accommodate the 25-year, 24-hour design storm to meet the water quality and quantity standards that follow: a. Water Quantity: Peak post-development runoff shall not exceed peak pre-development runoff rates. b. Water Quality: Treatment of stormwater runoff shall be required for all development, redevelopment and, when expansion occurs, existing developed areas. The stormwater treatment system or

TABLE III-7:
CITY OF FORT MEADE POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
	systems can be project specific, serve sub-areas within the City or be a system to serve the entire City. Regardless of the area served and in accordance with Chapter 62-25, F.A.C., the stormwater treatment systems must provide a level of treatment for the runoff from the first one (1) inch of rainfall for projects in natural drainage basins of 100 acres or more, or as an option, for projects or project subunits in natural drainage basins of less than 100 acres, the first one-half (1/2) inch of runoff, from the design storm in accordance with Rule 62-25, F.A.C. in order to meet the receiving water quality standards of Rule 62-302, section 62-302.500, F.A.C. Stormwater discharge facilities shall be designed so as to not lower the receiving water quality or degrade the receiving water body below the minimum conditions necessary to maintain their classifications as established in Chapter 62-302, F.A.C. It is intended that all standards in these citations are to apply to all development and redevelopment and that any exemptions or exceptions in these citations, including project size thresholds, do not apply for concurrency determinations. Infill residential development within improved residential areas or subdivisions existing prior to the adoption of this comprehensive plan, must ensure that its post-development stormwater runoff will not contribute pollutants which will cause the run-off from the entire improved area or subdivision to degrade receiving water bodies and their water quality as stated above.
Policy 2.4	The City establishes a stormwater management level of service for existing development equal to a 3-year, 24-hour storm event. Stormwater will be handled by and contained within existing stormwater management facilities.
Comprehensive Plan – Conservation Element	
Policy 2.3	The wetlands and 100-year floodplains the Peace River are designated as "environmentally sensitive lands." These areas shall be designated Conservation on the Future Land Use Map. Their hydrologic functions and habitat characteristics shall be protected through the enforcement of land development regulations, including zoning, site plan review, buffer zones, minimum setback requirements, regulation and prohibition of certain uses, and stormwater treatment regulations. Development shall be restricted to access structures, such as boat ramps and boardwalks, only.

TABLE III-7:
CITY OF FORT MEADE POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
Unified Land Development Code – Article 3 Development Design and Improvement Standards	
Section 3.05.00 Stormwater Management	Treatment of stormwater runoff shall be required for all development, redevelopment and, when expansion occurs, existing developed areas. The stormwater treatment system or systems can be project specific or serve sub-areas within the County. The design and performance of all stormwater management systems shall comply with applicable State Regulations (Chapter 17-25 and Chapter 17-302, Florida Administrative Code) and the rules of the SWFWMD stated in Chapter 40D-4, F.A.C. Stormwater discharge facilities shall be designed so as to not lower the receiving water quality or degrade the receiving water body below the minimum conditions necessary to maintain their classifications as established in Chapter 17-302, F.A.C. Steps to control erosion and sedimentation shall be taken for all development.
Unified Land Development Code – Article 5 Resource Protection Standards	
5.01.00 Development in Flood-Prone Areas 5.01.01 – Purpose and Intent	It is the purpose and intent of this Section to promote the public health, safety and general welfare and to minimize public and private losses due to flood conditions in specific areas vulnerable to floods or hazardous to other lands which are inadequately elevated, flood-proofed, or otherwise unprotected from flood damages.

TABLE III-8
CITY OF FROSTPROOF POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
Comprehensive Plan – Future Land Use Element	
Policy 1.1	The following Residential Future Land Use classifications are adopted: a. Residential Estate (RE) – Two (2.0) to four (4.0) units/acre to be applied to existing area developed in this density range. Densities within the 100-year flood plain shall be limited to 2.0 units/acre and to Flood Damage Prevention provisions of the Unified Land Development Code (ULDC).
Policy 4.3	The City shall require developers to provide utilities on-site, infrastructure improvements for all stormwater management systems, open space, traffic flow and parking as required to serve their development.
Policy 4.4	The City shall consider topographic, hydrological and vegetative cover factors in the site plan review process of proposed developments, and require changes in the proposed design and, as applicable by this review, that erosion and sediment control be employed during construction.
Policy 5.1	Implement the adopted Comprehensive Plan and prevent the expansion of non-conforming uses of land and which as a minimum: C. Protect areas subject to seasonal and periodic flooding and provide for drainage and stormwater management.

TABLE III-8
CITY OF FROSTPROOF POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
Policy 6.2	Proposals for development within areas designated by FEMA as being in the flood prone area shall be approved by the City only if residential densities (single family and mobile home) are limited to one unit/acre, have finished floor elevations 12" higher than base flood elevations or the existing crown in the adjoining road, whichever is greater, and if proposed development is consistent with performance standards set forth in both the City's Zoning Ordinance and Flood Damage Prevention Ordinance, regulating development within the floodplain and designated zoning district. Residential site planning shall include locating structures on individual lots out of the 100-year floodway whenever, or to the greatest extent possible, while maintaining all other required setbacks and buffers. When residences cannot be located out of the floodplain, stilting shall be required. The crown in road requirement for finished floor elevations may be waived by the City Engineer based on final site grading plans that shown that this would not cause first floor flooding.
Policy 6.3	The developer/owner of any site shall be responsible for the on-site management of stormwater runoff in a manner so that post-development runoff rates, volumes and pollutant loads do not exceed pre-development conditions by meeting the following standards: A. Water Quality: Peak post-development runoff rates shall not exceed peak pre-development runoff rates. B. Water Quality: Stormwater treatment shall be required for all new development, redevelopment and when expansion occurs, existing developed areas. The stormwater treatment system or systems can be site-specific, serve sub-areas of the City, or be a system to serve the entire City. Regardless of the area served, the stormwater treatment systems must provide a level of treatment which meets the requirements of Chapter 40D, Florida Administrative Code (FAC) and the SWFWMD Basis of Review for ERP Applications in order to meet the receiving water quality standards of Rule 62-302 FAC. Stormwater discharge facilities shall be designed so as to not lower the receiving water quality or degrade the receiving water body below the minimum conditions necessary to maintain their classifications as established in Chapter 62-302 FAC. It is intended that all standards in these citations are to apply to all development and redevelopment, and that any exemptions or exceptions in these citations, including project size

TABLE III-8
CITY OF FROSTPROOF POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
	thresholds, do not apply for concurrency determinations. Infill residential development within improved residential areas or subdivisions existing prior to the adoption of this comprehensive plan, must ensure that its post-development stormwater runoff will not contribute pollutants which will cause the runoff from the entire improved area or subdivision to degrade receiving water bodies and their water quality as stated above. Development and redevelopment projects, which are not exempt from Southwest Florida Water Management District permitting requirements, must also meet the requirements of applicable Florida Statues and FAC.
Policy 11.2	Public facilities and utilities shall be located to: A. Maximize the efficiency of services provided. B. Minimize their cost. C. Minimize their impacts on the natural environment. D. Expand the City's Sanitary Sewer Service Area in the south-central section of the City in support of sites for affordable housing projects. E. Provide opportunities for residents to hook up to the municipal sewer system through sewer collection system, extensions and mandatory hookup requirements in the south-central section of the City; and F. Provide for retrofitting the City's stormwater management system to provide for water quality treatment.

TABLE III-8
CITY OF FROSTPROOF POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
OBJECTIVE 10	LEVEL OF SERVICE STANDARDS SHALL BE MET WITHIN THIS PLAN FOR ALL NEW FACILITIES. [9J-5.001(1)(h), (2)(a, b, c)] a. Average and peak flow design capacity for sanitary sewer facilities b. Design capacities for solid waste c. Design storm return frequency for stormwater facilities capacity as specified by the Southwest Florida Water Management District. d. Minimum design flow, storage capacity, and pressure for potable water facilities. e. Water quality standards for stormwater discharge as specified by the Southwest Florida Water Management District and the Department of Environmental Protection.
Policy 19.1	The following criteria will be used for school locations: F. The site should be of sufficient size to ensure that building and ancillary facilities and future expansions can be located away from flood plains, flood prone areas, wetlands and other environmentally sensitive areas, and will not interfere with historic or archaeological resources.
Comprehensive Plan – Transportation Element	
Policy 1.4	Proposed local City controlled roadway projects shall be evaluated and ranked in order of priority according to the following guidelines: B. Whether the project increases efficiency of use of existing facilities, prevents or reduces future improvement cost, provides service to developed areas lacking full service, or promotes in-fill development; and whether it prevents or reduces development within designated flood plains area; D. Whether the project design fits the existing topography, soil conditions and drainage conditions. E. The City Public Works Director maintains a systematic program to open and eliminate Unpaved streets at identified in the existing traffic network section of this element.

TABLE III-8
CITY OF FROSTPROOF POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
Comprehensive Plan – Infrastructure Element	
GOAL 1	THE CITY OF FROSTPROOF SHALL PROVIDE NEEDED PUBLIC SERVICES INCLUDING SANITARY SEWER, POTABLE WATER, STORMWATER DRAINAGE AND SOLID WASTE DISPOSAL TO MEET CURRENT AND ANTICIPATED NEEDS AND WILL PROTECT THE NATURAL GROUNDWATER AQUIFER RECHARGE AREAS.
Policy 1.1	The following levels of service standards are hereby adopted and shall be used as the basis for determining the availability of facility capacity and the demand operation. In order to ensure that these levels of service standards are maintained, methodologies for determining available capacity and demand shall incorporate appropriate peak demand coefficients for each facility and for the type of development proposed. Flood Control –No significant structural flooding. All drainage solutions not exempt from review shall be reviewed and approved by the Southwest Florida Water Management District (Accumulated stormwater is not to enter the first floor of any structure because of 100-year storm flood conditions).
Policy 1.4	The City shall enforce land development regulations that require that stormwater management systems shall be designed to meet a level of service that meets the requirements Southwest Florida Water Management District and shall meet the standards that follow: 1. Water Quality: Peak post-development run-off rates shall not exceed peak pre-development run-off rates. 2. Water Quality: Stormwater treatment shall be required for all new development, redevelopment, and when expansion occurs, existing developed areas. The stormwater treatment system or systems can be site-specific, serve sub-areas of the City, or be a system to serve the entire City. Regardless of the area served, the stormwater treatment systems must provide a level of treatment which meets the requirements of the Florida Administrative Code (FAC), for the run-off from the first one (1) inch of rainfall for projects in drainage basins of 100 acres or more, or, as an option for projects or project subunits with drainage basins less than 100 acres, the first one-half (.5) inch of run-off, from the design storm in accordance with FAC, in order to meet the receiving water quality standards of FAC. Stormwater discharge facilities shall be designed

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Source (Document, Number, Chapter, Section)	Text/Description
	so as to not lower the receiving water quality or degrade the receiving water body below the minimum conditions necessary to maintain their classification as established in, FAC. It is intended that all standards in these citations are to apply to all development and redevelopment and that any exemptions or exceptions in these citations, including project size thresholds, do not apply for concurrency determinations. Infill residential development within improved residential areas or subdivisions existing prior to the adoption of this comprehensive plan must ensure that its post-development stormwater run-off will not contribute pollutants which will cause the run-off from the entire improved area or subdivision to degrade receiving water bodies and the water quality as stated above. Development and redevelopment projects, which are not exempt from Southwest Florida Water Management District permitting requirements, must also meet the requirements of applicable Florida Statues.
Policy 2.1	The City has performed a master stormwater drainage study which completes the identification and evaluation of the drainage system within its boundaries, determine its deficiencies, and develop programs for its improvement and maintenance. The study includes at a minimum: A. Drainage Patterns by Sub-basins. B. Structures in Place. C. Natural and Man-Made Drainage Features. D. Connectivity. E. Disposition. F. Easements and Right-of-Ways. G. Capacities. H. Other Features; and I. Intergovernmental Concerns
Policy 2.3	The City amended the Comprehensive Plan to include the recommendations of the master stormwater management study and a cone of influence study.
Policy 4.1	The City shall develop and implement educational programs that: A. Encourage recycling of both hazardous and non-hazardous waste materials;

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CITY OF FROSTPROOF POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
	B. Minimize disposal of household hazardous materials; and C. Continue to support recycling efforts by non-profit organizations.
Policy 4.3	The City shall enforce regulations requiring the disposal of oil, tires, batteries, white goods and hazardous waste in accordance with Polk County's landfill regulations and the Polk County Hazardous Materials Plan.
Policy 6.5	The Public Works Department shall establish a maintenance schedule, with a minimum annual review, of all stormwater management facilities that are the responsibility of Frostproof.
Policy 6.6	The Public Works Department shall conduct annual inspections of all stormwater management facilities maintained by the private sector and require repairs of maintenance activities as appropriate.
Policy 6.7	The City shall require all commercial and industrial operations that handle hazardous materials to report their storage and usage of such materials annually to the Polk County Civil Defense Division in order to update the County's Hazardous Materials Plan as required by EPA.
Policy 6.8	The City shall follow State and Federal regulations pertaining to the handling, transporting, and storage of hazardous wastes.
OBJECTIVE 7	FROSTPROOF SHALL ENFORCE ITS STORMWATER MANAGEMENT PROGRAM AND TO PROTECT NATURAL GROUNDWATER RECHARGE AND DRAINAGE FEATURES INCLUDING THE ATTAINMENT AND MAINTENANCE OF STATE WATER QUALITY STANDARDS OF THE LAKE REEDY AND LAKE CLINCH AND THE MAINTENANCE OF THE CAPACITY FOR STORAGE AND CONVEYANCE OF FLOODWATERS WITHIN FLOOD PRONE AREAS.
Policy 7.1	The City shall continue not to issue development orders or other construction approvals for projects requiring Southwest Florida Water Management District stormwater management permits prior to the issuance of such permit.
Policy 7.2	The City will enforce land development regulations to implement design criteria, both for quantity and quality of water consistent with requirements that all new development manage runoff from a 25-year frequency, 24-hour duration design storm event and meet the following standards:

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Source (Document, Number, Chapter, Section)	Text/Description
	1. Water Quality: Peak post-development run-off rates shall not exceed peak pre-development run-off rates. 2. Water Quality: Stormwater treatment shall be required for all new development, redevelopment, and when expansion occurs, existing developed areas. The stormwater treatment system or systems can be site-specific, serve sub-areas of the City, or be a system to serve the entire City. Regardless of the area served, the stormwater treatment systems must provide a level of treatment which meets the requirements of the applicable, Florida Administrative Code (FAC), for the run-off from the first one (1) inch of rainfall for projects in drainage basins of 100 acres or more, or as an option for projects or project subunits with drainage basins less than 100 acres, the first one-half (2) inch of run-off, from the design storm in accordance with applicable FAC, in order to meet the receiving water quality standards of applicable FAC. Stormwater discharge facilities shall be designed so as to not lower the receiving water quality or degrade the receiving water body below the minimum conditions necessary to maintain their classification as established in applicable FAC. It is intended that all standards in these citations are to apply to all development and redevelopment and that any exemptions or exceptions in these citations, including project size thresholds, do not apply for concurrency determinations. Infill residential development within improved residential areas or subdivisions existing prior to the adoption of this comprehensive plan must ensure that its post-development stormwater run-off will not contribute pollutants which will cause the run-off from the entire improved area of subdivision to degrade receiving water bodies and their water quality as stated above. Development and redevelopment projects that are not exempt from Southwest Florida Water Management District permitting requirements must also meet the requirements of applicable FAC and Florida Statue.

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Source (Document, Number, Chapter, Section)	Text/Description
Policy 7.3	The City will enforce land development regulations that require an average 25' wide upland buffer zone be established around identified wetland vegetative communities and along Lake Clinch, Lake Reedy and Lake Ida. Septic tanks and drain fields shall be placed in front yards on all lakefront properties and be placed no closer than 50' to the established mean high-water elevation of the adjoining lake. The locating of septic tanks within the 100-year flood prone area, except as replacements, shall be prohibited.
Policy 7.4	No certificate of occupancy or other final development approval shall be issued prior to certification of construction completion of the stormwater management system permitted by the Southwest Florida Water Management District.
Policy 7.6	The City shall enforce its land development regulations that require areas designated by FEMA as being in the flood prone areas be limited to a density of 1 units/acre, and have finished floor elevations 12 inches higher than base flood elevations or the existing crown in the adjoining road whichever is greater. Residential site planning shall include locating structures on individual lots located within designated flood prone areas out of the 100 year flood whenever or to the greatest extent possible while maintaining all other required setbacks and buffers. The City Engineer based on final site grading plans that show that this would not cause first floor flooding may waive the crown in road requirement for finished floor elevations.
Policy 7.7	The City shall enforce land development requirements that will require that stormwater engineering including site grading; design and construction specifications shall be reviewed by the City for approval. Approved developments will bear the total cost of both the review and construction.
Policy 7.11	The City shall establish a Stormwater Utility Management Fee to improve the existing surface water quality and assist in meeting the water quality classifications established by DEP for Lake Clinch, Lake Reedy, and Lake Ida.

TABLE III-8
CITY OF FROSTPROOF POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
Comprehensive Plan – Conservation Element	
Policy 3.3	The City shall implement its comprehensive stormwater management polices establishing: 1. A 25' wide buffer zone adjacent to lakes and wetland areas to preserve natural vegetation wetland areas to preserve natural vegetation, which provides filtration of stormwater runoff. 2. General design and construction standards for on-site stormwater management systems for new development to ensure that post-development runoff rates, volumes and pollutant loads do not exceed pre-development conditions, and at a minimum, retain the first 2 inch of rainfall on site. 3. Standards for all new developments to ensure compliance with treatment practices and standards adopted by the Water Management District and other appropriate rules and regulations. 4. Best management practices for agricultural land uses consistent with State and Federal recommended standards to reduce pesticide and fertilizer runoff and soil erosion. 5. Prohibiting the location of septic tanks and package plants within the 100-year flood plain except as replacements.
Policy 4.1	The City shall enforce its Land Development Regulations that protect the natural functions of the 100-year floodplain so that the flood-carrying and flood storage capacity are maintained by reducing new construction densities to 1 units per acre or less within the floodplain areas, excluding property replacement.
Policy 4.3	The City shall not to allow temporary or permanent solid waste disposal sites within the City in order to protect groundwater quality. Temporary hazardous waste collection centers shall be set up based on Polk County requirements and regulations.
Policy 4.5	The City shall identify and recommend to the County and the South West Florida Water Management District environmentally sensitive lands (i.e., floodplains) that would warrant acquisition under the Florida Forever Program or the Save Our Rivers (SOR) Program.

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Source (Document, Number, Chapter, Section)	Text/Description
Policy 9.6	The City of Frostproof, Polk County and the SWFWMD shall develop joint planning and management programs which include controlling water levels, preservation of wetlands and enforcement of City and County floodplain ordinances in order to protect the identified wetlands and the lake system located on Frostproof's borders.
Policy 9.7	Frostproof's environmentally sensitive lands shall include creek banks, major drainage ways, viable wetlands, (identified or unidentified), floodplains, poorly drained soils indicating potential wetland vegetation and prime groundwater recharge areas, if any. The prime groundwater recharge areas to be determined by the SWFWMD.
OBJECTIVE 10	THE CITY, IN CONCERT WITH POLK COUNTY, SHALL MAINTAIN A HAZARDOUS WASTE MANAGEMENT PROGRAM FOR THE PROPER STORAGE, RECYCLING, COLLECTION AND DISPOSAL OF HAZARDOUS WASTE.
Policy 10.1	The City shall have its Fire Department develop an emergency response plan to handle accidents involving hazardous waste.
Policy 10.2	The City shall promote the recycling of hazardous waste by publicizing the County's list of approved recyclers.
Policy 10.4	The City shall seek funding from the DEP's Local Hazardous Waste Collection Grants Program to manage hazardous wastes.
Policy 12.1	The City shall encourage the acquisition or conservation of an interconnected network of open spaces, natural areas, and agricultural lands. The network will provide for: a. Protection of natural resources and wildlife habitat. b. Habitat corridors through linked open spaces. c. Protection of historic and cultural resources. d. Recreational opportunities. e. Community health benefits. f. Economic development opportunities; and g. Multi-use trails connecting population centers to natural areas.

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Source (Document, Number, Chapter, Section)	Text/Description
Comprehensive Plan – Capital Improvements Element	
Policy 2.7	The level of service standard that shall be applied to stormwater management facilities is the retention and detention of a storm with a 24-hour, 25 year frequency are as follows: 1. Water Quality: Peak post-development run-off rates shall not exceed peak pre-development run-off rates. 2. Water Quality: Stormwater treatment shall be required for all new development, redevelopment and when expansion occurs, and existing developed areas. The stormwater treatment system or systems can be site-specific, serve sub-areas or the City or be a system to serve the entire City. Regardless of the area served, the stormwater treatment systems must provide a level of treatment which meets the requirements of Chapter 40D-4, Florid Administrative Code (FAC), for the run-off from the first one-half (.5) inch of rainfall for the design storm in accordance with Rule 40-D, FAC, and the SWFWMD Basis of Review for ERP Applications in order to meet the receiving water quality standards of Rule 62-302 FAC. It is intended that all standards in these citations are to apply to all development and redevelopment and that any exemptions or exceptions in these citations, including project size thresholds, do not apply for concurrency determinations. Infill residential development within improved residential areas or subdivisions existing prior to the adoption of this comprehensive plan, must ensure that its post-development stormwater run-off will not contribute pollutants which will cause the run-off from the entire improved area or subdivision to degrade receiving water bodies and their water quality as stated above. Development and redevelopment projects that are not exempt from Southwest Florida Water Management District permitting requirements must also meet the requirements of FAC.

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Source (Document, Number, Chapter, Section)	Text/Description
Policy 2.10	The facilities required to meet the level of service needs of existing development and previously issued development orders shall be evaluated when determining when a deficiency exists and when new facilities are required to meet new growth needs. The recommendations of the Master Stormwater Management Study shall be amended to this capital improvements program within six months of completion of the study.
OBJECTIVE 3	All public expenditures in the designated flood prone area shall support existing development patterns and not encourage substantial additional development.
Policy 3.1	The flood prone area shall be that area designated as areas of 100-year flood on the City's flood prone area map.
Policy 3.2	Public expenditures in the flood prone area shall be limited to: 1. Maintenance of existing facilities. 2. Improvements designed to improve the efficiency of existing facilities. 3. Replacement of obsolete or worn out facilities. 4. Recreation facilities. 5. Water quality improvement facilities. 6. New construction and or expansion of arterial and collector streets.
Policy 3.3	The City shall require construction within the flood prone area to conform to the standards adopted in the Frostproof Floodplain Regulations.
Policy 5.7	Policy 5.7: Where possible, public facilities including potable water, sanitary sewer, stormwater management and solid waste disposal, shall be provided and managed through enterprise fund accounts.
Unified Land Development Code – Article 5 Density, Dimensional and Setback Regulations	
Section 5.06.05. Gas Pumps and Pump Islands.	Gas pumps and pump islands are accessory structures normally associated with convenience stores, automotive service businesses, truck stops and terminals, and businesses maintaining fleets of vehicles. The intent of this Section is to set forth requirements for the location and appearance of gas pumps and pump islands. All new and

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Source (Document, Number, Chapter, Section)	Text/Description
	substantially reconstructed facilities providing for the dispensing of fuels shall meet the following: E. Liquid fuels shall be stored in underground tanks. The design of these tanks shall meet all current standards established for the prevention of leaks and environmental contamination of groundwater supplies. Fuel tanks located in an industrial zoning district may be exempt from the requirement to be located underground. Where permitted, above ground fuel tanks shall be required to meet the same setback as a gas pump or pump island.
Section 5.09.00. Waterfront Properties.	All new structures adjacent to surface water or watercourses shall be located landward of the 100 year flood plain or fifty (50) feet landward of the 10 year flood plain if one has been established (whichever is less restrictive) and a minimum twenty-five foot (25') upland buffer shall be required around identified wetlands. A site-specific survey shall be performed, signed and sealed by a professional surveyor and mapper. Water dependent structures are exempt from this requirement. Article 6, Section 6.07.06, J. provides stormwater setbacks requirements along waterfront properties. Development of waterways and canals involving dredge and fill and excavation shall require permits from State and Federal agencies having jurisdiction, including but not limited to the Southwest Florida Water Management District (SWFWMD), Army Corp of Engineers (ACOE), Florida Department of Transportation (FDOT), Florida Department of Environmental Protection (FDEP), and the Environmental Protection Agency (EPA). Such permits shall be submitted to the Building Official as part of a site development application.
Unified Land Development Code – Article 6 Development Design and Improvement Standards	
Section 6.07.03. State Agency Permitting.	The Southwest Florida Water Management District (SWFWMD) and the Florida Department of Environmental Protection (FDEP) have an operating agreement that identifies which agency will process permits for different types of projects. Generally, the SWFWMD processes residential and commercial developments, while the FDEP processes power plants, wastewater treatment plants and single-family home projects. These agencies regulate water quality and are responsible for issuing surface water management system permits which ensure that new development properly treats stormwater runoff to remove pollutants, protects wetlands and floodplains and reduces the risk of flooding. Rule 40D-4.041, Florida Administrative Code, and amendments

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Source (Document, Number, Chapter, Section)	Text/Description
	thereto, provide conditions for which a permit is required by the SWFWMD. Rule 40D-4.051, Florida Administrative Code, and amendments thereto, provides for activities which are exempt from SWFWMD permitting.
Section 6.07.03.01. Emergency Exemption to Permitting.	These regulations shall not be construed to prevent any act necessary to prevent material harm to or destruction of real or personal property as a result of a present emergency, including but not limited to, fire and hazards resulting from violent storms or hurricanes or when the property is in imminent peril and obtaining a permit is impractical. A report of any emergency action shall be made to the City Building Official, the SWFWMD and/or the FDEP as applicable, by the owner or person in control of the property on which the emergency action was taken as soon as practicable, but no more than ten (10) days following such action. All activities, nevertheless, are to be accomplished in a manner which prevents flooding of adjacent sites and roadways by stormwater runoff.
Section 6.07.04. Stormwater Management Plans and Certificates of Occupancy.	A. Stormwater Management Plan Requirements. 1. Plan submission shall meet the requirements of Section 10.03.00 of this Code. 2. If the development activity is regulated by the SWFWMD, subject to Rule 40D-4.041 or Rule 40D-4.051, Florida Administrative Code (FAC), or the FDEP, the person proposing development or redevelopment in the City shall submit to the City, the stormwater management plan/permit or permit exemption as part of, or attached to, the site plans for the proposed development; 3. The applicant shall provide any additional stormwater related information to the city's engineer if he or she finds it necessary for the proper review of the proposed activity. 4. The plan shall contain a certification that it was prepared by a professional engineer registered in the State of Florida and that the project complies with the terms of the permit. 5. The filing of an application for a permit shall constitute a grant and consent by the property owner for enforcement officials to enter and inspect the project to ensure compliance with the requirements of this Code.

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CITY OF FROSTPROOF POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
	6. The applicant shall be required to adhere strictly to the plan as approved. Any changes or amendments to the plan must be approved in writing by the agency issuing the permit and by the City. 7. Approval of the stormwater management plan is required prior to obtaining a City building or development permit. B. Certificate of Occupancy. A Certificate of Occupancy may be withheld by the City in cases where it can be shown that the owner/developer has not completed construction consistent with the permit.
Section 6.07.05. Performance Criteria.	A. All stormwater management systems shall be designed to meet a level of service which accommodates a storm with a 24-hour, 25-year frequency as established by the FDOT rainfall charts. B. Peak post-development runoff rates shall not exceed peak pre-development runoff rates. C. Detention structures shall be designed to release runoff to the downstream drainage system over a period of time so as not to exceed the capacity of the existing downstream drainage system. The peak rate of discharge from a site after development or redevelopment shall approximate the peak rate of discharge from the site prior to development or redevelopment as computed for a 24-hour, 25-year frequency storm. D. The volume of runoff from a site after development or redevelopment shall approximate the volume of runoff from the site prior to the development or redevelopment and shall not exceed the latter volume by more than ten percent (10%) for a 25-year, 24-hour storm unless the intent of this recharge provision will be met through detention of the difference between said volumes, in which case said volume difference may be released over not less than a 24-hour, nor greater than a 72-hour, period of time. E. Runoff from higher adjacent or upstream lands shall be considered, and a provision for conveyance of such runoff shall

TABLE III-8
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Source (Document, Number, Chapter, Section)	Text/Description
	be included in the drainage plan. The drainage system shall not adversely impact downstream owners or adjacent lands. F. No site alteration shall cause siltation of wetlands, pollution of downstream wetlands or reduce the natural retention or filtering capabilities of wetlands. G. Structural controls and other Best Management Practices (BMP's) used to reduce pollutants in stormwater discharges shall be operated and maintained so as to function in accordance with the original design or performance criteria. Operation and maintenance shall be done so as to ensure the treatment of stormwater, or reduction in pollutants in stormwater discharges, consistent with appropriate Federal, State or Water Management District rules or permit requirements. H. Runoff shall be treated to remove oil and floatable solids before discharge from the site.
Section 6.07.06. System Design Standards.	A. The design, construction, and performance of all stormwater management systems shall comply with the provisions of Chapter 62-25 (Stormwater Discharge) and Chapter 63-302 (Surface Water Quality) of the Florida Administrative Code (FAC); the requirements of the Southwest Florida Water Management District (SWFWMD), Rules 40D-4 (Individual Resource Permits), 40D-40 (Standard General Environmental Resource Permits) and 40D-400 (Environmental Resource Permit) of the Florida Administrative Code (FAC); the Florida Department of Environmental Protection's (FDEP's) Best Management Practices, and Chapter 373 (Management and Storage of Surface Waters) of the Florida Statutes. Physical structures shall be constructed consistent with Florida Department of Transportation (FDOT) standards. B. The design and construction of the proposed stormwater management system shall be certified as meeting the requirements of this Section by a professional engineer registered in the State of Florida. C. In phased developments, stormwater systems for each integrated phase shall be independently functional unless specific development provisions are approved by the City.

TABLE III-8
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Source (Document, Number, Chapter, Section)	Text/Description
	D. To the maximum extent practicable, natural vegetation shall be used as a component of drainage design. The manipulation of the water table shall not be so drastic as to endanger the natural vegetation beneficial to water quality. E. The proposed stormwater management system shall be designed to accommodate the stormwater that originates within the development and stormwater that flows onto or across the development from adjacent lands. F. No surface water may be channeled or directed into a sanitary wastewater system. G. All man-made components within a stormwater management system shall be easily accessible for maintenance by streets, public rights-of-way or access easements. H. Dredging, clearing of vegetation, deepening, widening, straightening, stabilizing or otherwise altering natural surface waters shall be minimized. I. Natural surface waters shall not be used as sediment traps during or after development. J. A twenty-five (25) foot wide vegetated buffer shall be retained or created along the shores, banks or edges of all natural or man-made surface waters to prevent erosion and provide filtration of stormwater runoff. K. Retention areas shall be designed to prevent or discourage the breeding and hatching of mosquitoes.

TABLE III-8
CITY OF FROSTPROOF POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
Section 6.07.07. Intergovernmental Coordination of Approval.	Prior to development plan approval by the City, the stormwater management plan shall be reviewed, and its approval documented by all other governmental authorities having jurisdiction. Approval by such authorities shall be a mandatory requirement prior to obtaining a building permit from the city. Government agencies which may have authority include: A. Florida Department of Transportation (FDOT); B. Southwest Florida Water Management District (SWFWMD); C. Florida Department of Environmental Protection (FDEP); D. Polk County Board of County Commissioners (BOCC); E. Army Corp of Engineers (ACOE); and F. The Environmental Protection Agency (EPA).
Unified Land Development Code – Article 9 Natural Resource Protection	
Entire Article including Introduction	It is the intent of the City Council, through the regulations of this Article, to protect, maintain and enhance the immediate and long-term health, safety and general welfare of the community by regulating land development activity that has the potential of degrading the natural resources which exist within the city. More specifically, it is the purpose of this Article to create a clear compilation of regulatory standards which implement the environmental goals, objectives and policies of the Frostproof Comprehensive Plan. Natural resources shall be protected from the adverse impacts of development through the following flood damage prevention, wetlands preservation and wellhead protection regulations. All records pertaining to the provisions of this Article shall be open for public inspection and shall be maintained in the Office of the Building Department.
Section 9.01.02. Purpose and Objectives.	A. Purpose It is the purpose of this Section 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, or which result in damaging increases in erosion or in flood heights or velocities;

TABLE III-9:
CITY OF HAINES CITY POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
Comprehensive Plan	
Chapter 1 Future Land Use Element	1. Requirements for Future Land Use Element goals, Objectives and Policies (c) The element shall contain one or more policies for each objective which addresses implementation activities for the: (1) regulation of land use categories included on the future land use map or map series; subdivisions; signage; and areas subject to seasonal or periodic flooding;
Chapter 8 Infrastructure 5. Drainage	Goal 8.5. Provide adequate protection of existing stormwater management systems and receiving water bodies.
Objective 8.5.1.	Regulation of Stormwater Discharges. The City shall continue to regulate stormwater discharges to prevent flooding of existing and proposed stormwater facilities.
Land Development Regulations - Chapter 14 Flood Protection	
14.1.3. – Intent	The purposes of this chapter and the flood load and flood resistant construction requirements of the Florida Building Code are to establish minimum requirements to safeguard the public health, safety, and general welfare and to minimize public and private losses due to flooding through regulation of development in flood hazard areas to: A. Minimize unnecessary disruption of commerce, access and public service during times of flooding. E. Minimize damage to public and private facilities and utilities. G. Minimize the need for future expenditure of public funds for flood control projects and response to and recovery from flood events.

TABLE III-10:
VILLAGE OF HIGHLAND PARK POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
Comprehensive Plan – Future Land Use Element	
Objective 1 Policy 1.1	Highland Park shall regulate the use of land consistent with the Future Land Use Element and the Future Land Use Map, that in turn shall ensure the compatibility of adjacent land uses, and, at a minimum, shall: e) Regulate land development in areas subject to periodic flooding and provide for drainage and stormwater management.
Policy 3.1	The Village shall identify existing land areas with potential development limitations necessitated by natural conditions and areas where development could adversely affect or be adversely affected by significant natural resources and man-made facilities and features. Control the density and intensity of development within such areas. The following areas of limited development are established in the Future Land Use Element text and map series for the Village of Highland Park: a) Floodplain Protection Areas (depicted on the Floodplains Map); b) Wetland Protection Areas (depicted on the Wetland Areas Map); c) Soils-Limited Areas (depicted on the Soils Map); d) Wellhead Protection Areas (Interim area as described by Policy 3.5. However, if Policy 3.5 is not adopted as a permanent standard, SWFWMD and the Village of Highland Park must further coordinate to determine Wellhead Protection Areas); and e) Historic Areas (depicted on the Future Land use Map).
Policy 3.2	Floodplain Protection Areas are established to indicate areas subject to potential periodic flooding and to limit uses and intensities to those for which the risk of loss would be minimal and which do not alter the natural function of the floodplain. The 100 Year Floodplain Map shall designate as Floodplain Protection Areas those areas classified by the Federal Emergency Management Agency (FEMA) as within the 100-year floodplain. These areas are designated on Floodplain Map in the Future Land Use Element.
Policy 3.3	Wetland Protection Areas, designated by the U.S. Department of Interior on Map 1.3 in the Future Land Use Element, are established to indicate potential wetland areas and to limit uses and intensities to those which would have minimal impact upon the natural functions of the wetland.
Policy 3.6	Wellhead Protection Zones shall prohibit the following storage activities and land uses within the designated 300 ft. radius of potable water wells within its jurisdiction: a) Landfills.

TABLE III-10:
VILLAGE OF HIGHLAND PARK POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
	b) Facilities for the bulk storage, handling or processing of materials on the Florida Substance List, with the exception of chlorine that is used for potable water disinfection. c) Activities that require the storage, use or transportation of restricted substances, agricultural chemicals, petroleum products, hazardous toxic waste, medical waste, etc. d) Feedlots or other commercial animal facilities. e) Wastewater treatment plants and percolation ponds. f) Mines; and g) Excavation of intersecting waterways or drainage facilities.
Policy 3.7	The Village of Highland Park shall require that all development proposals be accompanied by evidence that an inventory of wetlands; soils posing severe limitations to construction; unique natural habitats; endangered species of wildlife and plants; and areas prone to periodic flooding has been conducted. The Village shall further require that the extent to which any development or redevelopment is proposed to be placed in/on, to disturb, or to alter the natural functions of any of these resources be identified. Such identification shall occur at a phase in the development review process that provides the opportunity for the Village to review the proposed project to ensure that direct and irreversible impacts on the identified resources are minimized, or in the extreme, mitigated. Where development is determined to encroach upon a resource, Highland Park shall require a specific management plan to be prepared by the developer, which includes necessary modifications to the proposed development, specific setback and buffers, and clustering of development away from site resources, to ensure the protection, preservation or natural functions of the resource. [9J-5.006(3)(c)1,4,6]
Comprehensive Plan – Infrastructure Element	
Policy 2.11	Amend the land development regulations to protect cones of influence. Cones of influence shall be designated as the area within a 3600-foot radius of the wellhead. Proposed incompatible land uses within designated cones of influence shall be prohibited. The use or storage of hazardous materials within designated cones of influence shall be prohibited. [9J 5.011(2)(c)4.]
Policy 4.1	The following shall be the level of service standards for stormwater facilities: a. Drainage Structures: Ability to handle 25-year, 24-hour storm event. b. Stormwater Facilities: 25-year, 24-hour storm event at top of bank or berm. c. Storm sewers: Capacity to handle a 25-year storm event.

TABLE III-10:
VILLAGE OF HIGHLAND PARK POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
Policy 4.2	For all new development and redevelopment, post-development peak-discharge volumes and runoff-rates shall not exceed the corresponding pre-development volumes and rates. All development requests, except those for individual single-family dwelling units on a lot of record, minor subdivisions, and minor commercial sites, shall be required to submit engineering plans, prepared by a professional engineer licensed to practice in Florida, for the purpose of providing evidence of compliance with this policy. Single-family dwelling units on existing lots of record, minor subdivisions, and minor commercial sites are not considered to pose a significant amount of adverse impacts with regard to stormwater runoff. However, this does not exempt them from meeting the Level of Service Standards for storm-water management.
Policy 4.3	The volume of stormwater runoff to be treated for a site shall be determined by the type of treatment system. A wet detention treatment system shall treat one inch of runoff from the contributing area. Detention with an effluent filtration system (manmade underdrains), on-line and offline treatment systems shall treat runoff from the first one inch of rainfall; or as an option for projects or project subunits with drainage areas less than 100 acres, the first one-half inch of runoff. In determining the runoff from one inch of rainfall, calculations must be provided to determine the runoff from the directly connected impervious areas separately from any other contributing areas.
Policy 4.4	The Village of Highland Park shall continue to maintain stormwater drainage capacity in its natural drainage system until those are no longer safe, convenient, or economically feasible for community residents.
Policy 4.5	All structures shall have a floor elevation at or above the 100-year flood elevation.
Comprehensive Plan – Conservation Element	
OBJECTIVE 1:	SURFACE WATER RESOURCES - IN COORDINATION WITH THE DEPARTMENT OF ENVIRONMENTAL PROTECTION, THE VILLAGE OF HIGHLAND PARK SHALL PROTECT AND ENHANCE THE WATER QUALITY AND BIOLOGICAL HEALTH OF LAKE EASY. THE VILLAGE SHALL ENSURE THAT THE TROPHIC STATE INDEX OF LAKE EASY DOES NOT RISE DUE TO THE QUALITY OF STORMWATER RUNOFF FROM THE VILLAGE OF HIGHLAND PARK. (POLICIES SET FORTH IN THE SANITARY SEWER, SOLID WASTE, DRAINAGE, POTABLE WATER, AND NATURAL GROUNDWATER AQUIFER RECHARGE ELEMENT ALSO ADDRESS THIS CONCERN.)
OBJECTIVE 3:	FLOODPLAINS – UPON PLAN ADOPTION, THE VILLAGE OF HIGHLAND PARK SHALL PROTECT THE NATURAL FUNCTIONS OF FLOODPLAINS BY

TABLE III-10:
VILLAGE OF HIGHLAND PARK POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
	RESTRICTING ANY DEVELOPMENT IN ANY AREA DESIGNATED AS A FLOODPLAIN.
Land Development Regulations – Article 3 Development Design and Improvement Standards	
Section 3.04.00 Stormwater Management	Treatment of stormwater runoff shall be required for all development, redevelopment and, when expansion occurs, existing developed areas. The stormwater treatment system or systems can be project specific or serve sub-areas within the County. The design and performance of all stormwater management systems shall comply with applicable State Regulations (Chapter 17-25 and Chapter 17-302, Florida Administrative Code) and the rules of the Southwest Florida Water Management District stated in Chapter 40D-4, F.A.C. Stormwater discharge facilities shall be designed so as to not lower the receiving water quality or degrade the receiving water body below the minimum conditions necessary to maintain their classifications as established in Chapter 17-302, F.A.C. Steps to control erosion and sedimentation shall be taken for all development.
Land Development Regulations - Article 5 Resource Protection Standards	
5.01.00 Development in Flood-Prone Areas 5.01.01 Purpose and Intent	It is the purpose and intent of this Section to promote the public health, safety and general welfare and to minimize public and private losses due to flood conditions in specific areas.

TABLE III-11:
TOWN OF HILLCREST HEIGHTS POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
Comprehensive Plan – Future Land Use Element	
Objective 1	The Town of Hillcrest Heights will manage future growth and development through the implementation and enforcement of Land Development Regulations.
Policy 1.2	The Town's Land Development Regulations shall address land use, zoning, the subdivision of land, stormwater drainage, signage, parking access, on-site traffic flow, and periodic and seasonal flooding.
Policy 2.6	The developer or owner of any development site shall manage stormwater run-off on-site. Post-development run-off rates must be consistent with the level of service standard established in the Infrastructure Element. Stormwater treatment and disposal facilities shall meet the design and performance standards established in Section 17-25.025, F.A.C. The first inch of stormwater run-off shall be treated on-site, pursuant to Section 17-3.051, F.A.C. Stormwater discharge facilities shall be designed such that the receiving water body shall not be degraded below minimum conditions necessary to assure the suitability of water for the designated use of its classification as established in Chapter 17-3, F.A.C. These standards shall apply to all new development and redevelopment.
Policy 3.1	The Town shall continue to enforce Land Development Regulations which control the density and intensity of development within the following areas of limited development for the Town of Hillcrest Heights: a. Floodplain Protection Areas. Floodplain Protection Areas are established to indicate areas adjacent to Crooked Lake which are subject to potential periodic flooding. Development shall be limited to recreational structures related to Crooked Lake, such as boat docks and other similar structures for which the risk of loss would be minimal, and which do not alter the natural function of the floodplain. The 100 Year Floodplain Map shall designate as Floodplain Protection Areas those areas classified by the Federal Emergency Management Agency (FEMA) as occurring within the 100-year floodplain. b. Soils-Limited Areas. Soils-Limited Areas are established to indicate areas where development may be limited due to poor soil conditions. The Soils Map shall designate as Soils-Limited Areas those areas delineated by the U.S. Soil Conservation Service (SCS) as having "severe limitations" for septic-absorption fields or for the foundations of small buildings without basements.

TABLE III-11:
TOWN OF HILLCREST HEIGHTS POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
	c. Wellhead Protection Areas. Wellhead Protection Areas are established to protect existing and future public supply potable water wells from contamination. Wellhead Protection Areas are cones of influence around existing and future public supply to protect potable water wells from contamination. Wellhead Protection Areas are cones of influence around existing or future wellheads which extend into the jurisdiction of Hillcrest Heights, as determined by a professional hydrologist.
Comprehensive Plan – Infrastructure Element	
Policy 6.5	Best management practices for stormwater runoff shall be included in a new development's open space and landscaped areas to reduce maintenance and improve aesthetics.
Comprehensive Plan – Conservation Element	
Policy 1.2	The Town of Hillcrest Heights designates the floodplain of Crooked Lake as being environmentally sensitive.
Policy 1.3	Hillcrest Heights shall conserve, use, and protect its floodplain along Crooked Lake through enforcement of the Town's Land Development Regulations, including zoning, site plan review, buffer zone, and stormwater treatment regulations.
Policy 1.5	The Town of Hillcrest Heights shall abide by the Florida Department of Environmental Protection Best Management Practices program which monitors point source discharges into lakes. The Town shall adopt and enforce the Land Development Regulations that require shoreline buffer zones adjacent to lakes to preserve natural vegetation, and general design and construction standards for on-site stormwater management systems for new development and redevelopment to ensure that post-development runoff rates, volumes, and pollutant loads do not exceed pre-development conditions.
Land Development Regulations - Article 6 Use Districts Chapter 6. Floodplain Management District	
Section 1. Lands to Which this Chapter Applies	These regulations shall apply to all lands within the jurisdiction of the Town of Hillcrest Heights that are depicted on the official zoning map as being a flood hazard district. The flood hazard district shall be considered as an overlay district to existing zoning districts. Uses permitted within the underlying districts shall be permitted provided they conform to the requirements of this chapter.

TABLE III-12:
CITY OF LAKE ALFRED POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
Comprehensive Plan – Future Land Use Element	
Policy 1.1.20	The City will keep an annually updated list of all hazardous wastes and uses within 500 feet of every wellhead. The list of hazardous wastes and uses that will be tracked within the 500-foot protection zone shall be identified in the City's Unified Land Development Code. Wellheads and wellhead protection areas shall be mapped on the Future Land Use Map. Specifically, the map shall show the location of each well within the City, including all wells not currently within the City limits but part of the City's water system, and identify the 500-foot protection zone around each well. Wellhead protection areas shall be identified in order to prohibit the establishment of new uses from locating within the identified zone of protection that may be a potential source of pollution to the potable water system. The City of Lake Alfred will utilize, as it becomes available, the most current data available from the water management district or any other government agency to identify the cone of influence around each well, in order to afford the most protection to the potable water supply. Upon receipt and evaluation of such data, the City shall use the data to update the FLUM series with respect to the wellhead protection areas. The City will prohibit existing uses within the protection zone that use or create hazardous materials (such use is known as a nonconforming use) from being reestablished once the use has ceased. Regulations and the procedures for administration of nonconforming uses are adopted within the Unified Land Development Code of the City of Lake Alfred.
Policy 1.3.1	The City shall enforce adopted Land Development Regulations containing specific and detailed provisions sufficient to implement this Comprehensive Plan, and which will: e. Regulate areas subject to periodic flooding;
Policy 1.9.2	The City, through the implementation of its Land Development Regulations, will ensure that development approvals are consistent with the objectives and policies of the Polk County Hazard Mitigation Strategy, August 1999, as amended. In so doing, the City shall specifically limit the extension of infrastructure to areas of repetitive loss due to natural hazards, especially within any 100-year floodplain or wetland area.
Policy 1.9.3	The City shall identify and include in the 5-Year Capital Improvements Plan equipment and facility improvements needed to insure the delivery of municipal services during and after a natural disaster such as hurricane or flood; and to maintain traffic flow on all key roadways and at critical intersections during heavy rainfall events.

TABLE III-12:
CITY OF LAKE ALFRED POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
Comprehensive Plan – Transportation Element	
Policy 5.4	The City shall adopt Land Development Regulations that contain design criteria for the landscape buffering of new arterial roads located adjacent to or in close proximity to residential areas and for the landscaping of parking lots to provide maximum shading, aesthetics, and stormwater retention.
Comprehensive Plan – Infrastructure Element	
Policy 3.3	Stormwater management facilities shall be designed to accommodate the 25-year, 24-hour design storm to meet the water quality and quantity standards that follow: a. Water Quantity: Peak post-development runoff shall not exceed peak pre-development runoff rates. b. Water Quality: Treatment of stormwater runoff shall be required for all development, redevelopment and, when expansion occurs, existing developed areas. The stormwater treatment system or systems can be project specific, serve sub-areas within the City or be a system to serve the entire City. Regardless of the area served and in accordance with Chapter 62-25, F.A.C., the stormwater treatment systems must provide a level of treatment for the runoff from the first one (1) inch of rainfall for projects in natural drainage basins of 100 acres or more, or as an option, for projects or project subunits in natural drainage basins of less than 100 acres, the first one-half (1/2) inch of runoff, from the design storm in accordance with Rule 62-25, F.A.C. in order to meet the receiving water quality standards of Rule 17-302, section 17-302.500, F.A.C. Stormwater discharge facilities shall be designed so as to not lower the receiving water quality or degrade the receiving water body below the minimum conditions necessary to maintain their classifications as established in Chapter 17-302, F.A.C. It is intended that all standards in these citations are to apply to all development and redevelopment and that any exemptions or exceptions in these citations, including project size thresholds, do not apply for concurrency determinations. Infill residential development within improved residential areas or subdivisions existing prior to the adoption of this Comprehensive Plan,

TABLE III-12:
CITY OF LAKE ALFRED POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
	must ensure that its post-development stormwater runoff will not contribute pollutants which will cause the run-off from the entire improved area or subdivision to degrade receiving water bodies and their water quality as stated above.
Policy 3.4	The City establishes a stormwater management level of service for existing development equal to a 3-year, 24-hour storm event. Stormwater will be handled by and contained within existing stormwater management facilities.
OBJECTIVE 6: PROTECTION OF NATURAL DRAINAGE FEATURES AND MAN-MADE DRAINAGE STRUCTURES	PROTECT NATURAL DRAINAGE FEATURES, MAN-MADE DRAINAGE STRUCTURES AND THE CITY'S LAKES FROM RECEIVING STORMWATER RUNOFF THAT COULD DEGRADE WATER QUALITY IN THE CITY OR DOWNSTREAM FROM THE CITY.
Policy 6.3	The City shall regulate stormwater run-off for new development through the enforcement of performance standards for design and treatment of stormwater facilities at least as stringent as those specified in Section 62-25, F.A.C.
Policy 6.4	The City shall continue to participate in the Federal Flood Insurance Program.
Policy 6.6	The City shall correct all identified stormwater management facility deficiencies. Deficiencies for existing development shall be defined as the inability to manage a 25-year, 24 hour storm event, or contributing to the degradation of the receiving body below minimum conditions necessary to assure the suitability of water for the designated use of its classification as established in Chapter 17-3, F.A.C. The expenditure of public funds on stormwater management facility improvements shall be prioritized as follows: to fulfill legal obligations; to prevent further degradation of surface or water bodies; to provide adequate stormwater management facilities for existing development in the City; to provide adequate stormwater management for new development in the City; and to extend municipal stormwater management facilities to areas outside of the City.
Policy 6.8:	The City shall not extend stormwater management facilities to new areas if such an extension would exceed the present ability of the City to provide protection from flooding to presently served areas, consistent with the established level of service standard for new stormwater management facilities.
Comprehensive Plan – Conservation Element	

TABLE III-12:
CITY OF LAKE ALFRED POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
OBJECTIVE 2 PROTECTION AND CONSERVATION OF WETLANDS	THE CITY OF LAKE ALFRED WILL PROTECT AND CONSERVE WETLANDS AND THE NATURAL FUNCTION OF WETLANDS, AND SHALL DIRECT INCOMPATIBLE USES AWAY FROM WETLANDS.
Policy 2.3	The wetlands and 100-year floodplains of any lake, public wellfields, and wetlands shall be designated as "environmentally sensitive lands." These areas shall be designated Conservation on the Future Land Use Map. Their hydrologic functions and habitat characteristics shall be protected through the enforcement of Land Development Regulations, including zoning, site plan review, buffer zones, minimum setback requirements, regulation and prohibition of certain uses, and stormwater treatment regulations. Development shall be restricted to access structures, such as boat ramps and boardwalks, only.
Policy 7.3	The City will work with the Water Management District and the Department of Environmental Protection to develop a plan to restore or enhance as much of the degraded wetland and floodplain areas as feasible for lands acquired for public conservation, outdoor recreation and open space uses. Restoration activities should address native species composition and hydrology.
Policy 7.4	In order to help maintain and improve surface water quality, the City shall identify and prioritize for acquisition (in coordination with other governmental and non-profit agencies) properties that contain significant wetland, floodplain, shoreline, or drainage basin features that are critical to surface water resources quality.
Comprehensive Plan – Intergovernmental Coordination Element	
Policy 2.2	Stormwater management facilities shall be designed to accommodate the 25-year, 24-hour design storm to meet the water quality and quantity standards that follow: a. Water Quantity: Peak post-development runoff shall not exceed peak pre-development runoff rates. b. Water Quality: Treatment of stormwater runoff shall be required for all development, redevelopment and, when expansion occurs, existing developed areas. The stormwater treatment system or systems can be project specific, serve sub-areas within the City or be a system to serve the entire City. Regardless of the area served and in accordance with Chapter 62-25, F.A.C., the stormwater

TABLE III-12:
CITY OF LAKE ALFRED POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
	treatment systems must provide a level of treatment for the runoff from the first one (1) inch of rainfall for projects in natural drainage basins of 100 acres or more, or as an option, for projects or project subunits in natural drainage basins of less than 100 acres, the first one-half (1/2) inch of runoff, from the design storm in accordance with Rule 16-25, F.A.C. in order to meet the receiving water quality standards of Rule 62-302, section 62-302.500, F.A.C. Stormwater discharge facilities shall be designed so as to not lower the receiving water quality or degrade the receiving water body below the minimum conditions necessary to maintain their classifications as established in Chapter 62-302, F.A.C. It is intended that all standards in these citations are to apply to all development and redevelopment and that any exemptions or exceptions in these citations, including project size thresholds, do not apply for concurrency determinations. Infill residential development within improved residential areas or subdivisions existing prior to the adoption of this Comprehensive Plan must ensure that its post-development stormwater runoff will not contribute pollutants which will cause the run-off from the entire improved area or subdivision to degrade receiving water bodies and their water quality as stated above.
Policy 5.6	The City will enter into an interlocal agreement with Polk County for joint projects identified in the City's Stormwater Management Plan and the County's Stormwater Management Plan.
Comprehensive Plan – Capital Improvements Element	
Policy 2.2	Stormwater management facilities shall be designed to accommodate the 25-year, 24-hour design storm to meet the water quality and quantity standards that follow: a. Water Quantity: Peak post-development runoff shall not exceed peak pre-development runoff rates. b. Water Quality: Treatment of stormwater runoff shall be required for all development, redevelopment and, when expansion occurs, existing developed areas. The stormwater treatment system or systems can be project specific, serve sub-areas within the City or be a system to serve the entire City. Regardless of the area served and in

TABLE III-12:
CITY OF LAKE ALFRED POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
	accordance with Chapter 62-25, F.A.C., the stormwater treatment systems must provide a level of treatment for the runoff from the first one (1) inch of rainfall for projects in natural drainage basins of 100 acres or more, or as an option, for projects or project subunits in natural drainage basins of less than 100 acres, the first one-half (1/2) inch of runoff, from the design storm in accordance with Rule 16-25, F.A.C. in order to meet the receiving water quality standards of Rule 62-302, section 62-302.500, F.A.C. Stormwater discharge facilities shall be designed so as to not lower the receiving water quality or degrade the receiving water body below the minimum conditions necessary to maintain their classifications as established in Chapter 62-302, F.A.C. It is intended that all standards in these citations are to apply to all development and redevelopment and that any exemptions or exceptions in these citations, including project size thresholds, do not apply for concurrency determinations. Infill residential development within improved residential areas or subdivisions existing prior to the adoption of this Comprehensive Plan must ensure that its post-development stormwater runoff will not contribute pollutants which will cause the run-off from the entire improved area or subdivision to degrade receiving water bodies and their water quality as stated above.
Land Development Regulations – Article 5 Resource Protection Standards	
5.01.00 Development in Filled-Prone Areas 5.01.01 Administration 5.01.01.03 Intent	The purpose of these regulations and the flood load and flood resistant construction requirements of the Florida Building Code are to establish minimum requirements to safeguard the public health, safety, and general welfare and to minimize public and private losses due to flooding through regulation of development in flood hazard areas.

TABLE III-13:
TOWN OF LAKE HAMILTON POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
Comprehensive Plan – Future Land Use Element	
Objective 1.6: Land Development Regulations	Manage future growth and development through the preparation, adoption, implementation, and enforcement of Land Development Regulations.
Policy 1.6.2	The adopted Land Development Regulations shall regulate the use of land consistent with the Future Land Use Element and the Future Land Use Map Series, shall ensure the compatibility of adjacent land uses, and, at a minimum, shall: d) Regulate land development in areas subject to periodic flooding and provide for drainage and stormwater management.
OBJECTIVE 2.1	PRESERVE EXISTING WETLAND AREAS SO AS TO PROVIDE NATURAL FLOOD STORAGE AREAS AND MINIMIZE EROSION, FACILITATE THE RECHARGE OF SURFICIAL AQUIFERS, ACHIEVE BIOLOGICAL FILTRATION OF URBAN AND AGRICULTURAL POLLUTANTS, AND PROVIDE NATURAL HABITATS FOR ANIMAL AND PLANT SPECIES.
Policy 2.1.2	Establish zoning regulations to require that development shall be allowed only upon non-flood portions of any property subject to seasonal or periodic flooding, and that development be permitted only if the natural hydrological characteristics of flood-prone areas are maintained.
Policy 2.4.2	Establish standards for stormwater retention and runoff to be utilized in new development.
Comprehensive Plan – Infrastructure Element	
Policy 3.1.2	Provide adequate lake basins and storage areas for the accommodation of 25-year floodwaters without adversely affecting adjacent private lands.
Policy 3.1.6	Best Management Practices for stormwater runoff shall be included in a new development's open space and landscaped areas to reduce maintenance and improve aesthetics.
OBJECTIVE 3.2: PROTECTION OF NATURAL DRAINAGE FEATURES	REGULATE LAND USE AND DEVELOPMENT TO PROTECT THE FUNCTIONS OF NATURAL DRAINAGE WAYS THAT SERVE AS PRIMARY CONVEYANCE SYSTEMS FOR STORMWATER RUNOFF.
Policy 3.3.2	For all new development and redevelopment, post-development peak-discharge volumes and runoff-rates shall not exceed the corresponding pre-development volumes and rates. All development requests, except those for individual single-family dwelling units on a lot of record, minor

TABLE III-13:
TOWN OF LAKE HAMILTON POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
	subdivisions, and minor commercial sites, shall be required to submit engineering plans, prepared by a professional engineer licensed to practice in Florida, for the purpose of providing evidence of compliance with this policy. Single-family dwelling units on existing lots of record, minor subdivisions, and minor commercial sites are not considered to pose a significant amount of adverse impacts with regard to stormwater runoff. However, this does not exempt them from meeting the Level of Service Standards for storm-water management.
Policy 3.3.	The volume of stormwater runoff to be treated for a site shall be determined by the type of treatment system. A wet detention treatment system shall treat one inch of runoff from the contributing area. Detention with an effluent filtration system (manmade underdrains), on-line and offline treatment systems shall treat runoff from the first one inch of rainfall; or as an option for projects or project subunits with drainage areas less than 100 acres, the first one-half inch of runoff. In determining the runoff from one inch of rainfall, calculations must be provided to determine the runoff from the directly connected impervious areas separately from any other contributing areas.
Comprehensive Plan – Conservation Element	
OBJECTIVE 2	THE TOWN SHALL INCLUDE IN ITS LAND DEVELOPMENT REGULATIONS, DEVELOPMENT STANDARDS AND MITIGATION PROCEDURES TO CONSERVE, APPROPRIATELY USE, AND PROTECT THE NATURAL FUNCTION OF FLOODPLAINS AND WETLANDS AND TO PROTECT CONSERVATION WETLANDS AND ENVIRONMENTALLY SENSITIVE AREAS WITHIN THE TOWN.
Policy 2.9	Development proposals shall be accompanied by evidence that an inventory of wetlands; soils posing severe limitations to construction; unique habitat; endangered species of wildlife and plants; and areas prone to periodic flooding has been conducted. The Town shall further require that the extent to which any development or redevelopment is proposed to be placed in/on, to disturb, or to alter the natural functions of any of these resources be identified. Such identification shall occur at a phase in the development review process that provides the opportunity for the Town to review the proposed project to ensure that direct and irreversible impacts on the identified resources are minimized, or in the extreme, mitigated. Where development is determined to encroach upon a resource, the Town shall require a specific management plan to be prepared by the developer, which includes necessary modifications to the proposed development, specific setback and buffers, and clustering of development away from site

TABLE III-13:
TOWN OF LAKE HAMILTON POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
	resources, to ensure the protection, preservation or natural functions of the resource.
Comprehensive Plan – Intergovernmental Coordination Element	
Policy 7.6	The Town will enter into an interlocal agreement with Polk County for joint projects identified in the Town's Stormwater Management Plan and the County's Stormwater Management Plan.
Land Development Regulations - Article 4 Subdivisions	
Sec. 16-270. Suitability of land	Land that is subject to flooding conditions and land that is deemed by the town council based on USGS topographical surveys or other engineering considerations to be subject to flooding shall not be platted for residential occupancy, nor for such other use as may endanger health, life, or property, or aggravate erosion or flood conditions, until the developer provides adequate drainage or other corrective measures.
Land Development Regulations - Article 7 Development in Flood-Prone Areas	
Division 1 Generally Sec. 16-399 – Purpose and Intent	It is the purpose and intent 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.
Land Development Regulations - Article 8 Resource Protection Standards	
Sec. 16-582. - Purpose and intent.	It is the purpose of this division to maintain water quality and reduce nutrient loading in the town's lakes. In order to achieve this, the standards in this division restrict the amount of clearing or removal of shoreline vegetation and require additional stormwater treatment.

TABLE III-14:
CITY OF LAKE WALES POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
Comprehensive Plan – Future Land Use Element	
Objective 1: Land Development Regulations Policy 1.02	The adopted land development regulations shall regulate the use of land consistent with the Future Land Use Element and the Future Land Use Map Series, shall ensure the compatibility of adjacent land uses, and, at a minimum, shall: 4. Regulate development in areas subject to periodic flooding, and provide for drainage and stormwater management;
Objective 3	Protection of Natural, Historical, and Cultural Resources
Policy 3.02	Floodplain Protection Areas are established to indicate areas subject to potential periodic flooding and to limit uses and intensities to those for which the risk of loss would be minimal and which do not alter the natural function of the floodplain. The Future Land Use Map Series shall designate as Floodplain Protection Areas those areas classified by the Federal Emergency Management Agency (FEMA) as being within the 100-year flood plain. Standards regarding floor slab elevation and other requirements shall be established in land development regulations as directed in Conservation Element Policy 3.01.
Land Development Regulations – Article VI Resource Protection Standards	
Division 1 – Development in Flood Prone Areas Sec. 23-601. Statutory authorization, findings of fact, purpose and objectives.	c. Statement of purpose. It is the purpose of this division to promote the public health, safety and general welfare and to minimize public and private losses due to flood conditions in specific areas.

TABLE III-15:
CITY OF LAKELAND POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
Comprehensive Plan – Future Land Use Element	
Objective 9	Future growth and development will be managed through the preparation, adoption, implementation, and enforcement of land development regulations.
Policy 9A	The City of Lakeland will continue to enforce and periodically evaluate and update its land development regulations that contain specific and detailed provisions required to implement the adopted comprehensive plan and which, at a minimum: 4. Regulate areas subject to seasonal and periodic flooding and provide for drainage and stormwater management;
Land Development Regulations – Article VI Natural Resource Protection Standards	
Objective 6.2 (and all under policies)	Floodplain Management
Policy 6.2.1	APPLICABILITY The requirements established within this section shall apply in the following conditions: Any site alteration, construction or expansion of any structure within a delineated area of special flood hazard as defined by the Federal Emergency Management Administration (FEMA) on Flood Insurance Rate Maps

TABLE III-16:
CITY OF MULBERRY POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
Comprehensive Plan – Future Land Use Element	
Policy 1.4	Environmentally sensitive lands shall be defined as high aquifer recharge areas, public supply potable water wellfield protection areas, wetlands, floodplains, Areas of Critical State Concern as defined by Chapter 380, F.S.; Natural Resources of Regional Significance, as delineated in the Strategic Regional Policy Plan of the Central Florida Regional Planning Council; and natural resources identified by State and Federal agencies. The City will continue to enforce its zoning and site plan review procedures to include development standards that limit the density and intensity of land use in areas where soils or topography are not conducive to development. The City's site plan review process will be used to evaluate soil conditions on a proposed development site and will provide for appropriate design features to protect natural resources and the structural integrity of buildings and other facilities. The City shall require proposed developments to provide adequate information regarding the suitability of the soils for their intended use, in order to protect potable water wellfields and environmentally sensitive land.
Policy 1.6	The City shall depict generalized land uses on the Future Land Use Map and Map Series. The City has determined it appropriate to depict educational uses, public buildings and grounds and other public facilities as one land use category on the Future Land Use Map. The City will depict the following natural resources or conditions on the Future Land Use Map or Map Series: 1) existing and planned public potable water wells and wellhead protection areas; 2) rivers, lakes and floodplains; 3) wetlands; and, 4) minerals and soils.
Policy 1.9	Wellhead protection areas shall be identified and shown on the City's Future Land Use Map in order to prohibit the establishment of new uses from locating within the identified zone of protection that may be a potential source of pollution to the potable water system. The City will prohibit existing uses within the Zone of Protection that use or create hazardous materials (such use is known as a nonconforming use) from being re-established once the use has ceased. Regulations and the procedures for administration of nonconforming uses are adopted within the Unified Land Development Code of the City of Mulberry.
Policy 5.3	The City shall enforce development regulations that limit the location of incompatible uses that use or store hazardous substances in those areas that are determined susceptible to pollution of the City's potable water well fields based on the Polk County Wellhead Protection Area Delineation Project, and the requirements of Chapters 62-521 and 62-555, F.A.C.

TABLE III-16:
CITY OF MULBERRY POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
Policy 5.4	The City shall regulate development proposed to be located within the floodplains and wetlands as generally designated on the City's Flood Hazard Areas Map and its Wetland Areas Map. The City may approve such proposed development if no significant alteration of functions of the floodplains or wetlands will occur; and if protection is provided for potable water wellfields and environmentally sensitive land.
Objective 7: Land Development Regulations and Urban Form Policy 7.1	(5) Regulate areas subject to periodic flooding;
Objective 8	Coordination with the objectives and programs in Polk County's local mitigation strategy through hazard mitigation actions and in coordination with the countywide Comprehensive Emergency Management Plan, the City will endeavor to become a sustainable community with respect to reducing or eliminating long term risk to life and property from future hazards.
Policy 8.2	The City, through the implementation of its land development regulations, will ensure that development approvals are consistent with the goals and objectives of the Polk County Local Mitigation Strategy, (LMS), as amended. In so doing, the City shall specifically limit the extension of infrastructure to areas of repetitive loss due to natural hazards, especially within any 100-year floodplain or wetland area. Hazard mitigation actions shall be aimed at reducing or eliminating the long-term risk to life and property from future hazards and their effects, building a sustainable community, and breaking the repetitive cycle of injury, property damage and rebuilding caused by disasters.
Comprehensive Plan – Infrastructure Element	
Policy 3.3	Stormwater management facilities shall be designed to accommodate the 25-year, 24-hour design storm to meet the water quality and quantity standards that follow: a. Water Quantity: Peak post-development runoff shall not exceed peak pre-development runoff rates. b. Water Quality: Treatment of stormwater runoff shall be required for all development, redevelopment and, when expansion occurs, existing developed areas. The stormwater treatment system or systems can be project specific, serve sub-areas within the City or be a system to serve the entire City. Regardless of the area served

TABLE III-16:
CITY OF MULBERRY POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
	and in accordance with Chapter 62-25, F.A.C., the stormwater treatment systems must provide a level of treatment for the runoff from the first one (1) inch of rainfall for projects in natural drainage basins of 100 acres or more, or as an option, for projects or project subunits in natural drainage basins of less than 100 acres, the first one-half (1/2) inch of runoff, from the design storm in accordance with Rule 62-25, F.A.C. in order to meet the receiving water quality standards of Rule 62-302, section 62-302.500, F.A.C. Stormwater discharge facilities shall be designed so as to not lower the receiving water quality or degrade the receiving water body below the minimum conditions necessary to maintain their classifications as established in Chapter 62-302, F.A.C. It is intended that all standards in these citations are to apply to all development and redevelopment and that any exemptions or exceptions in these citations, including project size thresholds, do not apply for concurrency determinations. Infill residential development within improved residential areas or subdivisions existing prior to the adoption of this comprehensive plan, must ensure that its post-development stormwater runoff will not contribute pollutants which will cause the run-off from the entire improved area or subdivision to degrade receiving water bodies and their water quality as stated above.
Policy 3.4	The City establishes a stormwater management level of service for existing development equal to a 3-year, 24-hour storm event. Stormwater will be handled by and contained within existing stormwater management facilities.
OBJECTIVE 6: PROTECTION OF NATURAL DRAINAGE FEATURES AND MAN-MADE DRAINAGE STRUCTURES	PROTECT NATURAL DRAINAGE FEATURES, MAN-MADE DRAINAGE STRUCTURES (THE CITY'S LAKES) AND THE ALAFIA RIVER FROM RECEIVING STORMWATER RUNOFF THAT COULD DEGRADE WATER QUALITY IN THE CITY OR DOWNSTREAM FROM THE CITY.
Policy 6.4	The City shall continue to participate in the Federal Flood Insurance Program.
Policy 6.6	The City shall correct all identified stormwater management facility deficiencies. Deficiencies for existing development shall be defined as the inability to manage a 25-year, 24 hour storm event, or contributing to the degradation of the receiving body below minimum conditions necessary to assure the suitability of water for the designated use of its classification as classified by the water management district. The

TABLE III-16:
CITY OF MULBERRY POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
	expenditure of public funds on stormwater management facility improvements shall be prioritized as follows: to fulfill legal obligations; to prevent further degradation of surface or water bodies; to provide adequate stormwater management facilities for existing development in the City; to provide adequate stormwater management for new development in the City; and to extend municipal stormwater management facilities to areas outside of the City.
Policy 6.8	The City shall not extend stormwater management facilities to new areas if such an extension would exceed the present ability of the City to provide protection from flooding to presently served areas, consistent with the established level of service standard for new stormwater management facilities.
Comprehensive Plan – Conservation Element	
Policy 6.2	The City will utilize the technical expertise and assistance of the Southwest Florida Water Management District when reviewing new developments and redevelopment projects adjoining the 100-year floodplain of the North Prong of the Alafia River; or when reviewing development of any other identified wetland.
Policy 6.3	The wetlands and 100-year floodplains the North Prong of the Alafia River is designated as "environmentally sensitive lands." Its hydrologic function and habitat characteristic shall be protected through the enforcement of land development regulations, including zoning, site plan review, buffer zones, minimum setback requirements, regulation and prohibition of certain uses, and stormwater treatment regulations.
Comprehensive Plan – Intergovernmental Coordination Element	
Policy 5.6	The City will enter into an interlocal agreement with Polk County for joint projects identified in the City's stormwater management plan and the County's Stormwater Management Plan.
Comprehensive Plan – Capital Improvements Element	
Policy 1.1.3	Prioritization of Capital Improvements projects will be based on several criteria, including the elimination of public hazards, the elimination of capacity deficits, and financial feasibility.
Land Development Regulations – Article 3 Development Design and Improvement Standards	
3.05.00 Stormwater Management	Treatment of stormwater runoff shall be required for all development, redevelopment and, when expansion occurs, existing developed areas. The stormwater treatment system or systems can be project specific or

TABLE III-16:
CITY OF MULBERRY POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
	serve sub-areas within the City. The design and performance of all stormwater management systems shall comply with applicable State Regulations (Chapter 17-25 and Chapter 17-302, F.A.C.) and the rules of the Southwest Florida Water Management District (SWFWMD) stated in Chapter 40D-4, F.A.C. Stormwater discharge facilities shall be designed so as to not lower the receiving water quality or degrade the receiving water body below the minimum conditions necessary to maintain their classifications as established in Chapter 17-302, F.A.C. Steps to control erosion and sedimentation shall be taken for all development.
Land Development Regulations – Article 5 Resource Protection Standards	
5.01.00 Development in Flood-Prone Areas 5.01.01 Purpose and Intent	It is the purpose and intent of this Section to promote the public health, safety and general welfare and to minimize public and private losses due to flood conditions in specific areas.

TABLE III-17:
CITY OF POLK CITY POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
Comprehensive Plan –Future Land Use Element	
Policy 10.10.1: FLOODPLAINS	The Future Land Use Map Series shall designate and map as the "Floodplain-Protection Area" overlay: areas of special flood hazard; all lands lying within 100 feet from the top of the bank of a water course; and, those areas classified by the Federal Emergency Management Agency (FEMA) as within the 100-year floodplain. The "Floodplain Areas" shall be amended, at least annually, to include or exclude any areas added or removed from the official FEMA floodplain area maps. Development within a "Floodplain-Protection Area," shall conform to the following criteria: a. Development shall locate on the non-floodplain portions of a development site and density may be transferred from undeveloped floodplain areas to contiguous non-floodplain areas, under the same ownership, within the same platted subdivision, provided: 1. residential densities shall be transferred from the-100-year floodplain to the area outside the 100-year floodplain based on a density of 1 dwelling unit per 10 acres (1 DU/10 AC); and 2. such transfer does not result in lot sizes, or areas per dwelling unit, less than 65 percent (65%) of that required by Polk City's land development regulations (the minimum lot/area size shall be exclusive of the floodplain area) with lots no less than 1 acre. b. Development or redevelopment shall meet the requirements of the Polk City Land Development Code, and shall not: 1. enlarge the off-site floodplain. 2. alter the natural function of the floodplain; nor 3. result in post development run-off rates which exceed pre-development run-off rates for storm frequencies at least as stringent as those rates established by the applicable water management district pursuant to Titles 40C, 40D, and 40E, F.A.C. c. Development and redevelopment shall meet the requirements of the Polk City Land Development Code and as specified below:

TABLE III-17:
CITY OF POLK CITY POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
	1. Riverine Floodplains: Encroachments into the Floodplain, including fill material or structures, shall not be located within a distance of the center of the watercourse equal to 0.25 times the width of the area of special flood hazard or 50 feet each side from the center of the stream, whichever is greater, unless certification by a registered professional engineer is provided demonstrating (with supporting technical data) that such encroachments shall not result in any increase in flood levels during the occurrence of the 100-year base-flood discharge. An undisturbed 100-foot-wide wildlife habitat buffer shall be maintained from the ordinary high-water line. This buffer may be disturbed, to the extent necessary, and as approved by DEP, to provide reasonable access to a waterbody, to include the construction of boat ramps, docks, and walkways. 2. Lake Floodplains: Encroachment, including fill, new construction, substantial improvements, and other development, shall be prohibited from the floodplain unless certification (with supporting technical data) by a registered professional engineer is provided demonstrating that encroachments shall not result in any increase in flood levels during occurrence of the 100-year base-flood discharge. An undisturbed 25-footwide wildlife habitat buffer shall be maintained from the ordinary high-water line. This buffer may be disturbed, to the extent necessary, and as approved by DEP, to provide reasonable access to a lake, to include the construction of boat ramps, docks, and walkways. 3. All Other Floodplains: Development shall meet the requirements of the Polk City Land Development Code. d. If, within a parcel, there is no land located outside the 100-year floodplain, then the highest density allowed would be 1 dwelling unit per 20 acres (1 DU/20 AC). e. No parcel shall be created after adoption of this section that consists entirely of 100-year floodplains unless accompanied by a deed restriction which prohibits any future development on the parcel.

TABLE III-17:
CITY OF POLK CITY POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
	f. The development criteria listed in Policy 8.10.1 (a), (b) and (c), above, shall be included in Polk City's Land Development Code. g. A detailed flood insurance study shall be performed for all subdivision proposals and other proposed development which have five (5) acres or more in the 100-year floodplain. The construction of a single-family residence on a parcel of land containing five (5) or more acres which is not part of a subdivision or which is part of a subdivision in existence on the effective date of this plan is exempt from this requirement. Phases of a larger development, if the larger development meet the five (5) acre criterion, are not exempt from this requirement. If existing subdivisions are proposed for replatting, the replatted portion shall be required to comply with this requirement if the replatted portion meets the five (5) acre criterion. The study shall be performed in accordance with the Flood Insurance Study Guidelines and Specifications for Flood Contractors (FEMA Publication 37 or its equivalent).
Policy 10.10.7: SEPTIC TANKS	In the event Polk City annexes a developed lot with an existing septic tank and the Polk City centralized sewer system is temporarily not available to that developed lot, the following regulations apply until the centralized sewer system becomes available. a. All septic tanks and all drainfields shall be set back a minimum of 75 feet from the furthest upland extent of any wetland and shall require a 100-foot minimum setback from the ordinary high-water line of bodies of water. All septic tanks and drainfields must be located outside all 100-year floodplains. b. The following septic tank inspection and maintenance program established by Polk County shall be applicable to all developed lots using septic tanks annexed into Polk City until centralized sewer system is available to the lot: 1. Septic tanks shall be inspected by a qualified inspector on a regular, recurring basis. The initial inspection schedule shall be once every five years. 2. Data on sludge and scum accumulation should be collected from each tank serviced during the first five-year period. Only those tanks with excess sludge and/or scum accumulation, as defined in Chapter 10D-6, FAC, should be pumped out.

TABLE III-17:
CITY OF POLK CITY POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
	3. Polk City Engineer, or other individual deemed qualified by Polk City, shall review the accumulated data and suggest modifications to the schedule consistent with the results. If the data show that few, if any, tanks need to be pumped on a five-year schedule, or if the data show household characteristics that accurately predict those limited households which need more frequent pumping, the schedule should be modified accordingly. 4. In addition to inspecting for sludge and scum accumulation, the septic tank system shall be checked to ensure that the mound, drainfield, and septic tank are in good working order and in compliance with the requirements of Rule 10D-6, FAC. 5. The lot owner shall make all repairs that are necessary to bring the septic tank system into compliance with the requirements of Rule 10D-6, F.A.C.
Policy 10.10.14: SITE ALTERATION	Polk City's Land Development Code shall require that the recharge or storage characteristics of the development site not be significantly altered.
Policy 10.10.15: GREEN SWAMP IMPACT ASSESSMENT STATEMENT	All development, as defined in Section 380.04, FS, with the exception of a single-family dwelling unit and accessory uses, shall complete a Green Swamp Impact Assessment Statement which shall, at a minimum, address the following requirements: a. Floodplain development criteria requirements under Policy 8.10.1, where applicable. b. Wetland development criteria requirements under Policy 8.10.2, where applicable; and c. All development, as defined in Section 380.04, FS, shall be reviewed for consistency with the following objectives: 1. Minimize the adverse impacts of development on resources of the Floridan Aquifer, wetlands, and-flood-detention areas. 2. Protect or improve the normal quantity, quality and flow of ground water and surface water which are necessary for the protection of resources of State and regional concern.

TABLE III-17:
CITY OF POLK CITY POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
	3. Protect or improve the water available for aquifer recharge. 4. Protect or improve the functions of the Green Swamp Potentiometric High of the Floridan Aquifer. 5. Protect or improve the normal supply of ground and surface water 6. Prevent further salt-water intrusion into the Floridan Aquifer. 7. Protect or improve existing ground and surface-water quality. 8. Protect or improve the water-retention capabilities of wetlands. 9. Protect or improve the biological-filtering capabilities of wetlands. 10. Protect or improve the natural flow regime of drainage basins. 11. Protect or improve the design capacity of flood-detention areas and the water-management objectives of these areas through the maintenance of hydrologic characteristics of drainage basins.
Comprehensive Plan – Infrastructure Element	
Policy 6.7:	The City shall not extend stormwater management facilities to new areas if such an extension would exceed the present ability of the City to provide protection from flooding to presently served areas, consistent with the established level of service standard for new stormwater management facilities.
OBJECTIVE 9: FLOOD CONTROL	IN ORDER TO ENSURE FUTURE LAND USE ACTIVITIES DO NOT ALTER NATURAL DRAINAGE FUNCTIONS, AND TO PROVIDE PROTECTION OF PUBLIC HEALTH, SAFETY AND PROPERTY, THE CITY SHALL ADOPT LAND DEVELOPMENT REGULATIONS ADDRESSING FLOOD PROTECTION AND SURFACE WATER MANAGEMENT BY THE STATUTORY DEADLINE.
Comprehensive Plan – Conservation Element	
Policy 1.2	The development review checklist will ensure that the following issues are adequately addressed by the applicant regarding the development

TABLE III-17:
CITY OF POLK CITY POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
	site: soils, including suitability and erosion; topography; drainage; recharge capabilities; floodplain; setbacks; landscaping; stormwater treatment; permitting requirements of the Southwest Florida Water Management District, Department of Environmental Protection and U.S. Army Corps of Engineers; air quality; water quality; ecological communities; endangered species; historical and archaeological resources; Green Swamp Area of Critical State Concern; proximity to potable water wells and hazardous waste.
Objective 4: Flood Control	In order to ensure Future Land Use activities do not alter natural drainage functions, and to provide protection of public health, safety and property, the City shall adopt Land Development Regulations addressing Flood Protection and Surface Water Management by the statutory deadline.
Policy 6.1.5.	For areas of severely rated soils: wetlands and 100-year floodplain areas have been designated as conservation. For all other areas of severely rated soils: development in these areas must be limited to no greater than one unit per five acres; for existing, platted areas where historical development patterns preclude this density limitation, aerobic wastewater treatment systems shall be required.
Objective 9	To provide for the management of hazardous waste in order to protect environmental quality, health, safety, and welfare of Polk City's population, through the Land Development Regulations adopted by the statutory deadline.
Policy 10.1	The City shall classify as Conservation all flood plain areas and wetlands areas, and areas largely characterized by poorly drained wetland soils within the Green Swamp ACSC and outside the Polk City Exemption Area, as depicted on the latest FEMA "Flood Data Maps", the US Fish and Wildlife Services "National Wetlands Inventory Maps" and the SWFWMD "Specific Soils Maps". The developer may provide a specific site survey to delineate all Conservation areas.
Comprehensive Plan – Intergovernmental Coordination Element	
Policy 5.6	The City will enter into an interlocal agreement with Polk County for joint projects identified in the City's stormwater management plan and the County's Stormwater Management Plan.

TABLE III-17:
CITY OF POLK CITY POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
Land Development Regulations - Article 5 Resource Protection Standards	
5.01.00 Development in Flood-Prone Areas 5.01.03 Statement of Purpose	It is the purpose of this ordinance 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) Protect human life, health, safety and welfare, (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,

TABLE III-18:
CITY OF WINTER HAVEN POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
Comprehensive Plan – Conservation Element	
Conservation Goal	To protect, manage, and enhance the natural resources and environmental quality of Winter Haven.
Goal 3	Protect and enhance local watersheds so that the highest level of ground and surface water quality can be achieved and maintained.
Objective 3.1	Minimize flood damage through the preservation of the functions of floodplains, watersheds, and other natural water storage areas.
Land Development Regulations – Article V. Resource Protection Standards	
Division 1. – Floodplain Management Sec. 21-255. – Intent and purpose.	It is the purpose of this division 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: Sec. 21-255. – Objectives. (1) Minimize unnecessary disruption of commerce, access and public service during times of flooding. (2) Require the use of appropriate construction practices in order to prevent or minimize future flood damage. (3) Manage filling, grading, dredging, mining, paving, exaction, drilling operations, storage of equipment or materials and other development which may increase flood damage or erosion potential. (4) Manage alteration of flood hazard areas watercourses and shorelines to minimize the impact of devilment on the natural and beneficial functions of the floodplain. (5) Minimize damage to public and private facilities and utilities. (6) Help maintain a stable tax base by providing for the sound use and development of flood hazard area. (7) Minimize the need for future expenditure of public funds for flood control projects and response to and recovery from flood events. (8) Meet the requirements of the National Flood Insurance Program for community participation as set forth in Title 44 Code of Federal Regulations.

TABLE III-19:
CENTRAL FLORIDA REGIONAL PLANNING COUNCIL POLICIES AND REGULATIONS

Source (Document, Number, Chapter, Section)	Text/Description
Strategic Regional Policy Plan	
Goal 1.4	Minimize damage from floods.
Goal 1.5	Preserve, protect and restore natural Florida ecosystems in order to support their natural hydrologic and ecological functions.
Goal 1.16	Inhabitants of the region shall be protected from any proven adverse effects on their health caused by mining, as shown by epidemiological evidence and toxicological interpretations.
Goal 5.1	Protect public and private property and human lives from the effects of natural and man-made disasters.
Goal 5.2	Maximize Regional Evacuation Capability and Emergency Shelter Capacity.
Goal 5.3	Hazardous Materials will present the minimum feasible risk to the citizens of the region.
Goal 5.4	The emergency requirements of the Special Needs Population have been met.
Goal 5.5	Mitigation techniques reduce exposure and vulnerability of development, so recovery from natural disasters is timely and cost effective.
Goal 5.6	Minimize future risk to life in new and existing mobile home and recreational vehicle parks from the effects of natural disasters.

Ability to Expand on and Improve the Policies and Programs Identified

As the population grows in Polk County, the County and the jurisdictions within the County must ensure hazard mitigation laws address construction of new structures in areas susceptible to hazards either through prohibition, limitation, or additional requirements to reduce potential losses.

Local governments and the private sector shall provide ongoing training and information sessions for the public. Clear, unbiased knowledge is a key ingredient for safety of the public. Ongoing training may include public information notices and continuous training sessions online and at libraries, hospitals, and schools. Training and equipment to prepare for and subsequently resolve hazardous situations are necessary and vital. Jurisdictions must identify alternative financial resources and include these costs in respective governmental budgets.

Periodic review and revision of the local government ordinances, policies, and programs shall occur no less than once every other year.

Each municipality that has not yet done so should adopt a floodplain management ordinance and participate in the CRS. At the present time, the LMS serves as a jurisdiction's floodplain management plan when a municipality adopts the LMS as their floodplain management plan.

Integration with Other Plans

Review of Existing Plans and Information

Throughout the LMS update, review of existing plans, reports, and other sources of information occurred. The list below provides an example of reviewed plans. Section IX: Resources, lists information sources references in the update process.

Local Plans

- Comprehensive Plans for all municipalities
- Land Development Codes for all municipalities
- Polk County Comprehensive Emergency Management Plan
- Polk Transportation Planning Organization 2040 Long Range Transportation Plan
- Polk County Communitywide Wildfire Protection Plan
- Polk County Post Disaster Redevelopment Plan
- Polk County Disaster Debris Management Plan

Other Plans

- 2018 Florida Enhanced State Hazard Mitigation Plan
- Central Florida Regional Planning Council Strategic Regional Policy Plan
- Florida Division of Emergency Management 2018 Statewide Emergency Shelter Plan
- U.S. Census Bureau 2010 Census
- Florida Housing Data Clearinghouse – Polk County Profile
- Florida Geological Survey information
- National Climatic Data Center storm reports
- Newspaper articles

The LMS update incorporates information from the above listed plans, reports, and data sources, and utilizes the information resources included in Section IX. These sources allowed staff and the LMS Working Group to measure existing mitigation-related activities already in place within the County, identify additional hazards, understand the community's existing vulnerability, predict future impacts, and establish a strategy to mitigate those impacts.

Incorporation of LMS into Other Plans

Polk County, its jurisdictions, and partners, have incorporated the LMS into a variety of plans. The LMS partners will continue to work to incorporate and reference the LMS in other plans as appropriate.

SECTION IV – COMMUNITY PROFILE

44 Code of Federal Regulations	
44 CFR §201.6(c)(2)(ii)(c):	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 and the Environment

Polk County is Florida's fourth largest county with a total area of 2,011 square miles, of which approximately 85,000 acres are lakes. Polk County is also Florida's ninth largest county by population with an estimated 690,606 residents in 2019. Although they account for only 3.3 percent of the total population of Florida, approximately 10.4 million people reside within a 100-mile radius of Polk County making this area one of the largest concentrations of population in the Southeast. Eight counties border Polk County: Lake and Sumter to the north; Pasco and Hillsborough to the west; Hardee and Highlands to the south; Orange and Osceola to the east; Manatee to the southwest, and Okeechobee to the southeast.

Polk County includes 17 municipalities, which range population and size from 256 people to 107,552 people and 1.08 square miles to 74.69 square miles. The municipalities in Polk County include:

- City of Auburndale
- City of Bartow
- City of Davenport
- Town of Dundee
- City of Eagle Lake
- City of Fort Meade
- City of Frostproof
- City of Haines City
- Village of Highland Park
- Town of Hillcrest Heights
- City of Lake Alfred
- Town of Lake Hamilton
- City of Lake Wales
- City of Lakeland
- City of Mulberry
- Polk City
- City of Winter Haven

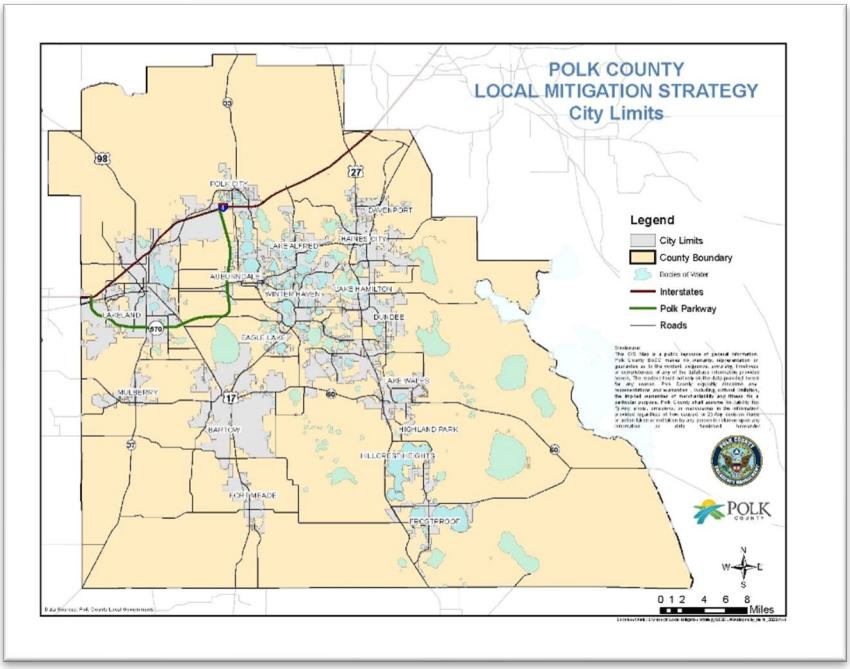


Figure IV.1: City limits

Polk County is home to ecologically-sensitive areas including the Green Swamp, Lake Wales Ridge, and environmental areas designated through the County's Environmental Lands Program. The southeastern portion of the County abutting Highlands County is located within the Avon Park Air Force Range.

Polk County's climate is a humid subtropical climate which includes hot, wet summers and mild, relatively dry winters. The mean annual temperature is 73 degrees, and the mean monthly temperature ranges from 61 degrees in January to 83 degrees in August. Temperatures commonly exceed 90 degrees from June to September and may fall below freezing for a few days in the winter months. Distribution of rainfall is uneven throughout the year. Approximately 55 percent of the annual rainfall results from thunderstorms that occur frequently between June through September. Thunderstorms can produce heavy but localized rainfall, resulting in several inches of precipitation falling in one location and little or none falling a few miles away. Tropical storms and hurricanes bring heavy precipitation into the area in the summer and fall. In the winter, rainfall is associated with frontal system activity, which is usually of a longer duration and more uniform than summer thunderstorm-related precipitation. April and November typically are the driest months.

Polk County contains the headwaters of five river basins—the Alafia, Hillsborough, Peace, Ocklawaha, and Withlacoochee Rivers. The County also contains 544 lakes and part of the Kissimmee River Basin. Surface water drainage from the County primarily occurs through the Peace and Kissimmee Rivers. Many changes to surface water drainage patterns have occurred since the late 1800s. For flood control purposes, the US Army Corp of Engineers channelized the Kissimmee River downstream from Lake Kissimmee and modified many other lake outlets, either by constructing structures to regulate lake levels or constructing canals to connect previously unconnected lakes (Spechler and Kroening, 2007).

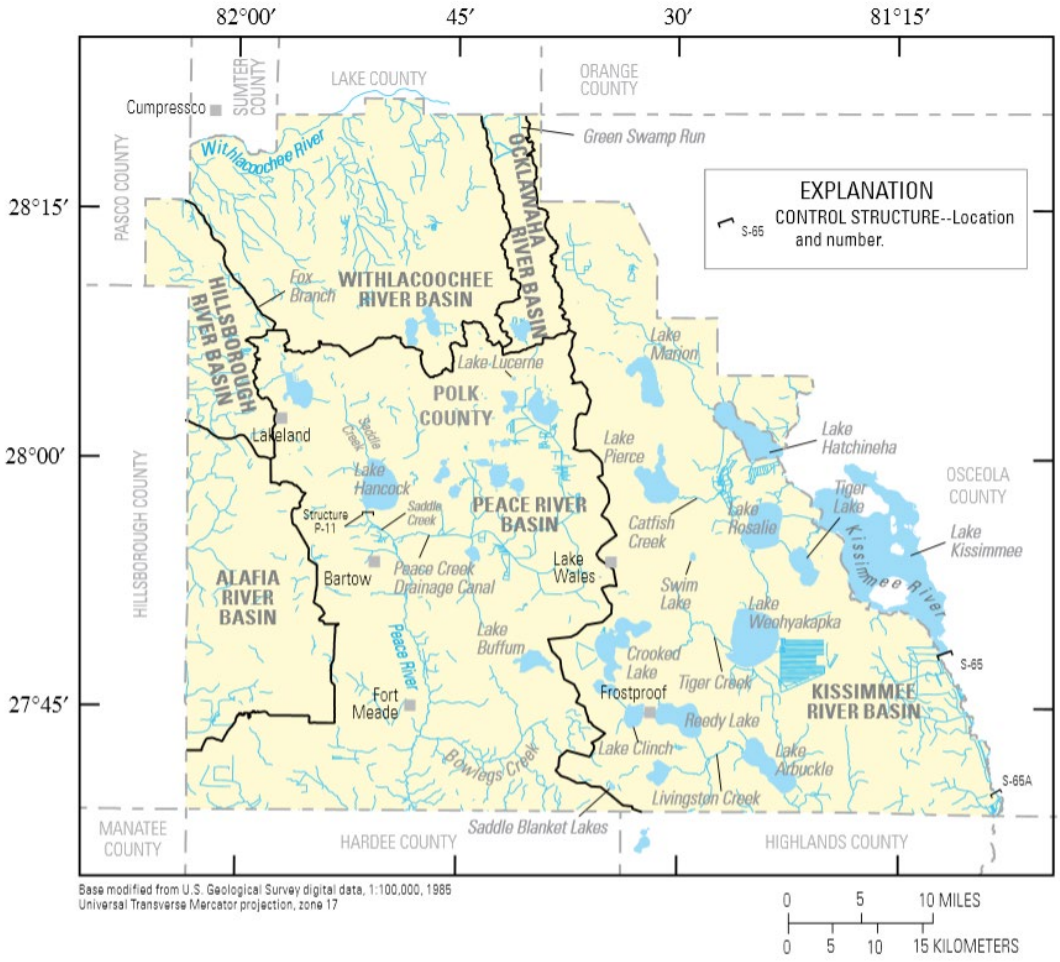


Figure IV.2: Major surface-water drainage basins, tributaries, and lakes
Source: Hydrology of Polk County, US Geological Survey, 2007

Mean annual runoff for individual basins in the County ranges from 6.6 to 16.1 inches. Streamflow generally is greatest in September and October, which is near the end of the wet season. The lowest streamflow usually occurs in May or June (Spechler and Kroening, 2007).

Land Area

Unincorporated Polk County includes approximately 84 percent of the County's 1.28 million acres. Lakeland and Winter Haven are the largest incorporated areas with 3.7 percent and 2.0 percent of the County, respectively. Highland Park is the smallest incorporated area with 690 acres and 0.1 percent of the County. While the municipalities comprise 16 percent of the County acreage, they house 39 percent of the County's population (Table IV-2).

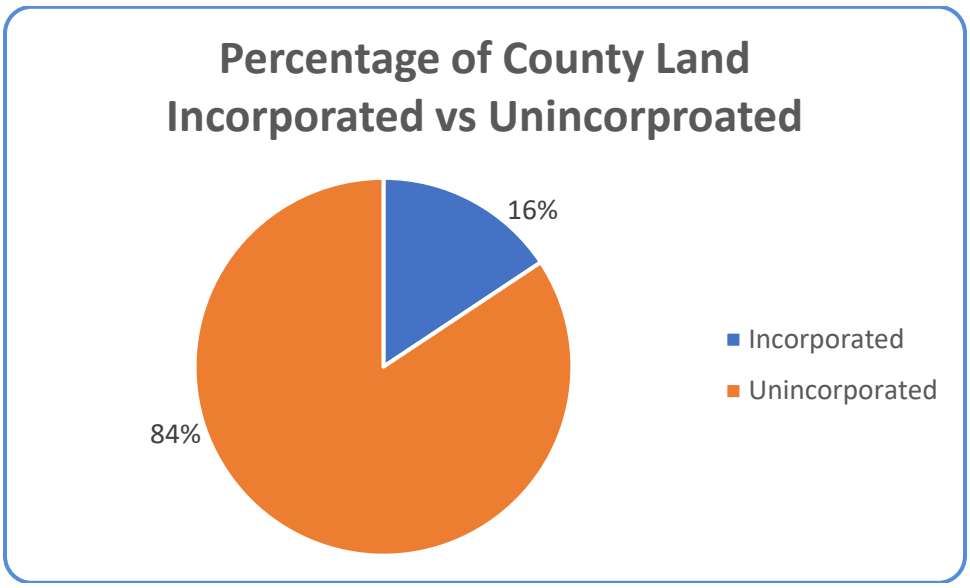


Figure IV.3: Acreage by unincorporated vs incorporated county Source: Polk County Property Appraiser and Jurisdictions

TABLE IV-1:
ACREAGE OF MUNICIPALITIES AND UNINCORPORATED AREAS IN POLK COUNTY

Municipalities	Acreage	Percent (%) of County
Auburndale	13,131	1.0
Bartow	33,561	2.6
Davenport	2,484	0.2
Dundee	7,354	0.6
Eagle Lake	2,402	0.2
Fort Meade	5,431	0.4
Frostproof	12,171	0.9
Haines City	13,496	1.0
Highland Park	690	0.1
Hillcrest Heights	5,529	0.4
Lake Alfred	8,304	0.6
Lake Hamilton	2,666	0.2
Lake Wales	12,778	1.0
Lakeland	47,800	3.7
Mulberry	4,549	0.4
Polk City	3,240	0.3
Winter Haven	26,178	2.0

TABLE IV-1:
ACREAGE OF MUNICIPALITIES AND UNINCORPORATED AREAS IN POLK COUNTY

Municipalities	Acreage	Percent (%) of County
Incorporated Area Total	**201,765**	**15.7**
Unincorporated Area Total	1,085,540	84.3
Total County	**1,287,305**	**100.0**

Source: Bureau of Economic and Business Research, Table 1: Estimates of Population by County and City in Florida: April 1, 2019

Population and Demographics

According to the US Census Bureau, the 2010 population of Polk County was 602,095. This represents a 24.4 percent increase from 2000, when the population was 483,924, and a higher percent change compared to the State increase of 17.6 percent. Table IV-2 provides the 2010 populations of incorporated and unincorporated areas within Polk County, along with the 2019 population estimates as provided by the Bureau of Economic and Business Research (BEBR). During this period, Polk County experienced a 14.7 percent increase, while the State of Florida experienced a 12.8 percent increase. All municipalities in Polk County experienced increases in population. Davenport, Polk City, Dundee, and Winter Haven experienced the greatest percent changes in population, and Hillcrest Heights, Fort Meade, Mulberry, and Frostproof experienced the smallest percent changes. According to the US Census Bureau, Davenport and Polk City are in the top five fastest-growing cities or towns in Florida.

BEBR's Rank of Top 100 Cities in Florida by Population Size, 2000-2019 includes three municipalities in Polk County. Lakeland is the 21st largest incorporated area in the State, with an estimated 2019 population of 107,552. Winter Haven is the 68th largest incorporated area in the State, with an estimated 2019 population of 44,815. Haines City is the 96th largest incorporated area in the State, with an estimated 2019 population of 25,533.

TABLE IV-2:
POPULATIONS OF MUNICIPALITIES AND UNINCORPORATED AREAS IN POLK COUNTY

Municipality	2010 Population	2019 Population Estimate	Percent (%) Change
Auburndale	13,507	16,534	22.4
Bartow	17,298	19,665	13.7
Davenport	2,888	6,038	109.1
Dundee	3,717	4,957	33.4
Eagle Lake	2,255	2,649	17.5
Fort Meade	5,626	5,786	2.8
Frostproof	2,992	3,197	6.9
Haines City	20,560	25,533	24.2
Highland Park	230	263	14.4

TABLE IV-2:
POPULATIONS OF MUNICIPALITIES AND UNINCORPORATED AREAS IN POLK COUNTY

Municipality	2010 Population	2019 Population Estimate	Percent (%) Change
Hillcrest Heights	254	256	1.0
Lake Alfred	5,015	6,199	23.6
Lake Hamilton	1,231	1,430	16.2
Lake Wales	14,225	16,062	12.9
Lakeland	97,422	107,552	10.4
Mulberry	3,817	3,983	4.4
Polk City	1,562	2,321	48.6
Winter Haven	33,874	44,815	32.3
Incorporated Total Population	**226,473**	**267,240**	**18.0**
Unincorporated Total Population	375,622	423,366	12.7
Total County	**602,095**	**690,606**	**14.7**

Source: Bureau of Economic and Business Research, Table 1: Estimates of Population by County and City in Florida: April 1, 2019

BEBR Medium estimates show Polk County's population increasing to 916,200 by 2045. BEBR Medium/High average estimates show Polk County's population increasing to 997,800 by 2045.

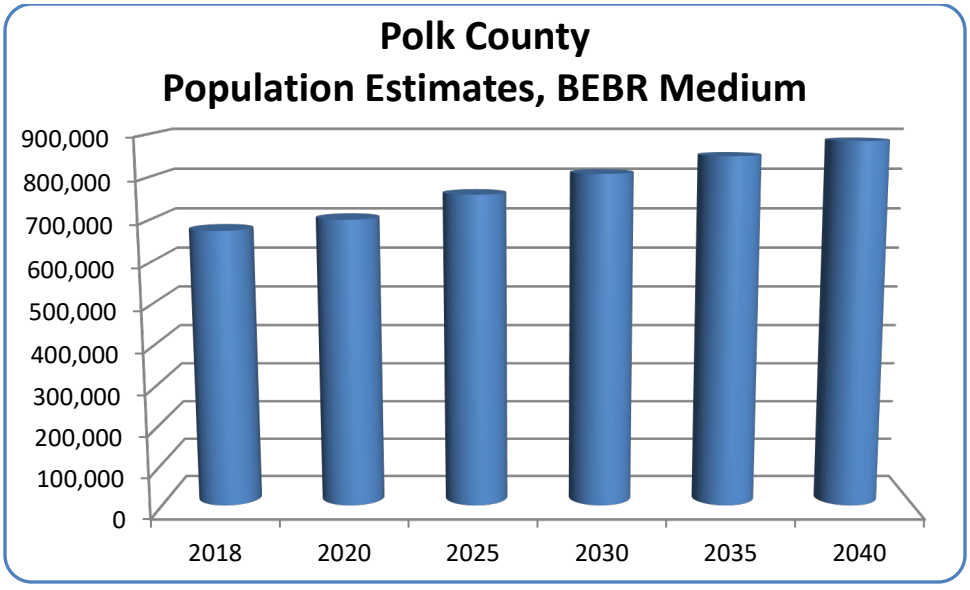


Figure IV.4: Population estimates Source: Bureau of Economic and Business Research

Polk County is 20th in the State for population per square mile. In 2000 and 2010, Polk County was 19th in the State. In 2010, Polk County had 335 people per square mile. In 2019, BEBR estimated Polk County had 384 people per square mile.

Figure 7. Population Per Square Mile, 2019

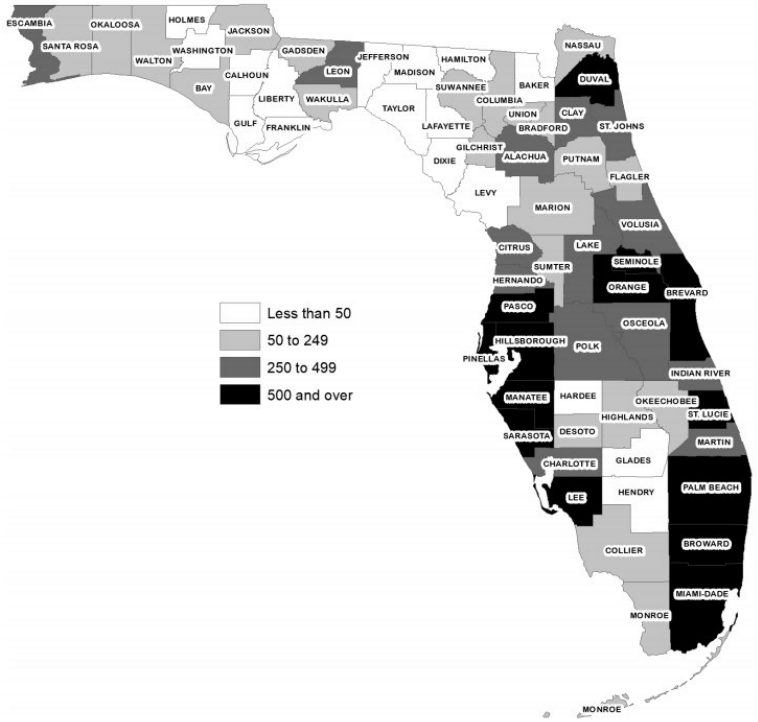


Figure IV.5: Population density per square mile for Florida counties 2019
Source: Bureau of Economic and Business Research

Polk County's age distribution has changed since 1990. The percentage of population in the 0-17 and 18-44 age groups decreased, while the percentage of population in the 45-64 and over 65 age groups increased. The 18-44 age group experienced the greatest change. Polk County has higher percentages of population in the 0-17 and over 65 age groups than the State of Florida, Polk County has a lower percentage of population than the State of Florida in the 18-44 and 45-64 age groups (Appendix A).

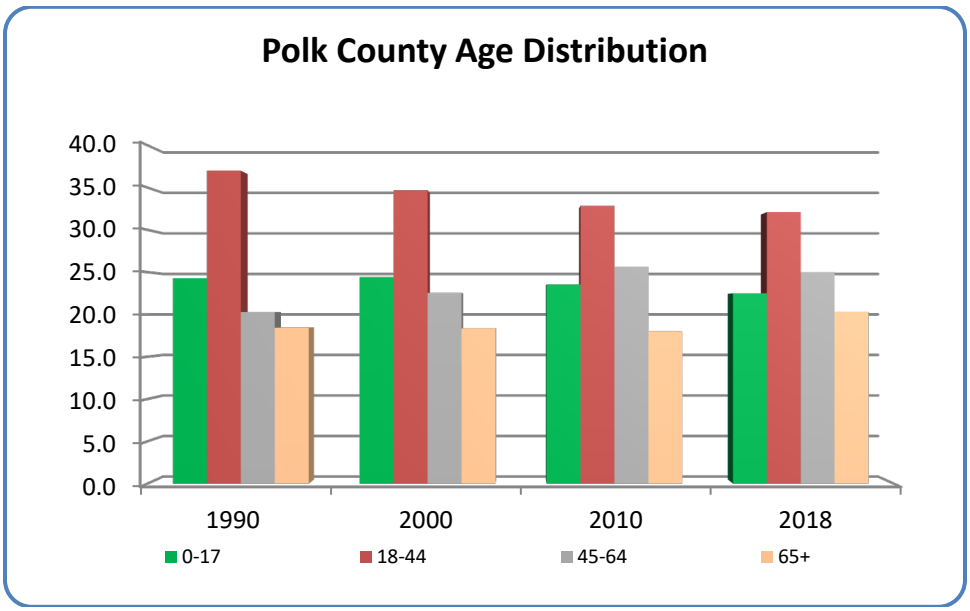


Figure IV.6: Age distribution; Source: Bureau of Economic and Business Research

According to the American Community Survey, 15.4 percent of the County's population and 34.7 percent of the population over 65 years old have a disability. The Population Below Poverty Level Map shows the locations of population below the poverty level in the County. Approximately 16.6 percent of the County's population falls below the poverty level. Approximately 7.6 percent of the households speak English less than "very well". The Limited English-Speaking Households Map (Appendix A) illustrates the distribution of limited speaking population over 14 years old in Polk County (Appendix A).

Homelessness

The Homeless Coalition of Polk County, Inc. conducts annual counts of homeless persons sheltered in emergency shelters, transitional housing, and safe havens on a single night during the last 10 days of January, as required by the Department of Housing and Urban Development (HUD). Per HUD, the criterion defining homeless include:

1. Those living in a publicly or privately-operated shelter providing temporary living arrangements;

2. Those persons whose primary nighttime residence is a public or private place not intended to be used as an accommodation for human beings, such as a car, park, abandoned building or campground;

3. A person who is exiting from an institution, where he or she lived for 90 days or less, and who was otherwise homeless immediately prior to entering that institution;

4. A person who is fleeing from a domestic violence situation; or

5. A person who will lose their primary nighttime residence within 14 days, where no subsequent dwelling has been found and the individual lacks the resources to obtain permanent housing.

Figure IV.7 indicated Polk County's homeless population counts for the single-night surveys over the last five years.

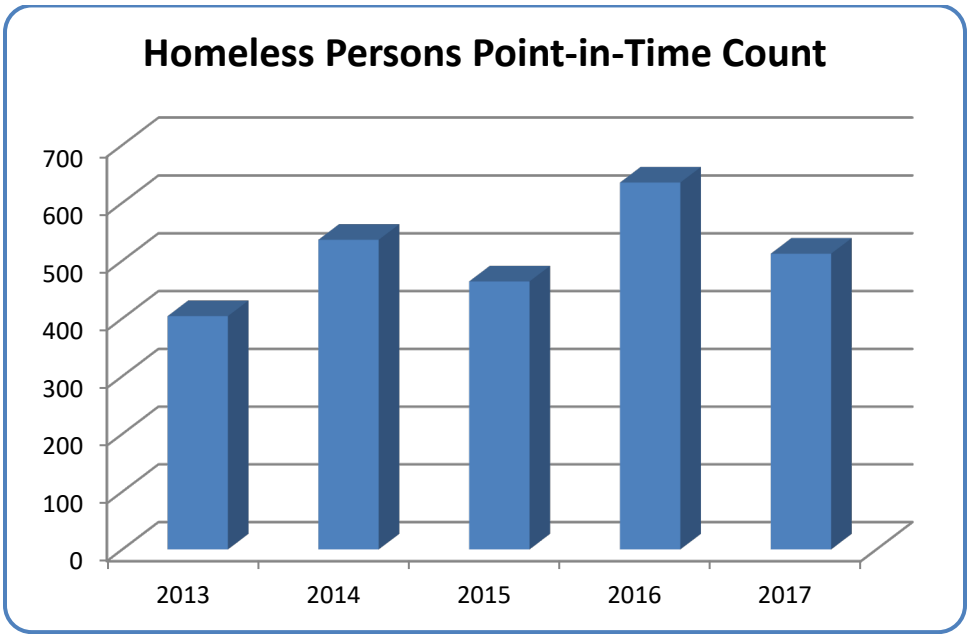


Figure IV.7: Annual homeless count; Source: Point-in-Time Count, Council on Homelessness, 2017 Annual Report

According to the Council on Homelessness 2017 Report, school districts capture the number of students identified as homeless during the school year and report that information to the Florida Department of Education. By Federal law, the public schools use the expanded definition of homeless persons to include those children and youth who lack a fixed, regular, and adequate nighttime residence, including those who are:

1. Sharing the housing of others due to loss of housing, economic hardship, or similar reason;

2. Living in motels, hotels, trailer parks, and campgrounds, due to lack of adequate alternative housing;

3. Living in emergency or transitional shelters;

4. Abandoned in hospitals or awaiting foster care placement;
5. Living in a public or private place not designed for or used as a regular sleeping accommodation for human beings to live;

6. Living in cars, parks, abandoned buildings, bus or train stations; substandard housing or similar setting; or

7. Migratory children living in any of the above circumstances.

In 2017, approximately 3.4 percent of the student population in Polk County was homeless. Figure IV.8 illustrates the living situation at the time the Polk County School Board identified the student as homeless. The majority of homeless students identified themselves as sharing housing or living in motels.

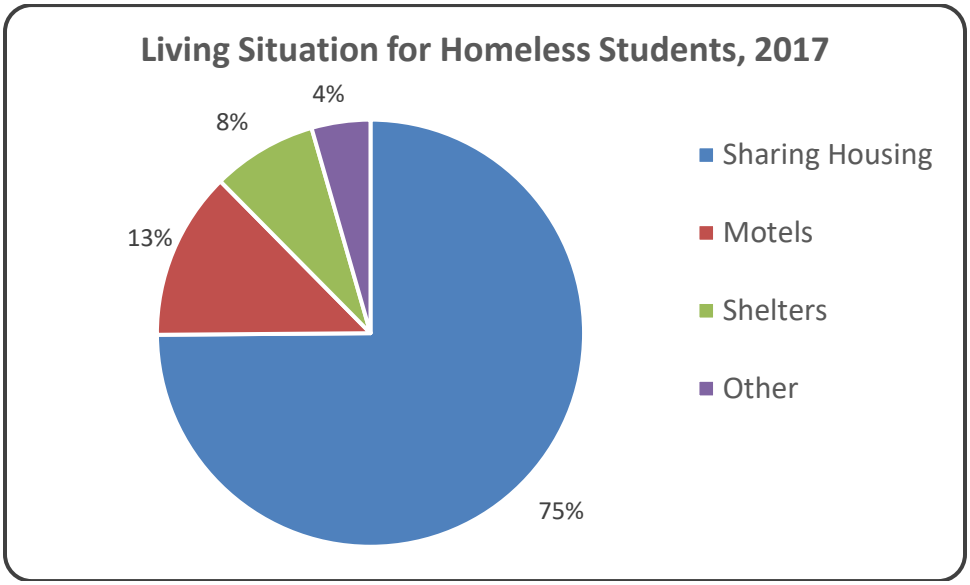


Figure IV.8: Homeless students living situation; Source: Point-in-Time Count, Department of Children and Families, Office on Homelessness 2017 Report

Like many communities across the nation, Polk County continues to address assisting its homeless population. Nonprofit organizations and ministries work with government agencies to reduce homelessness and provide aid.

Housing

The majority of the housing in Polk County is comprised of detached single-family dwelling units (61 percent). Approximately 22 percent of the housing units are mobile homes or trailers. Of the 17 municipalities, Mulberry has the highest percentage of mobile homes or trailers (51.9 percent). Fort Meade has the second highest amount (25.3 percent). Highland Park and Hillcrest Heights have none. Maps depict site-built home and mobile home densities in the County (Appendix A).

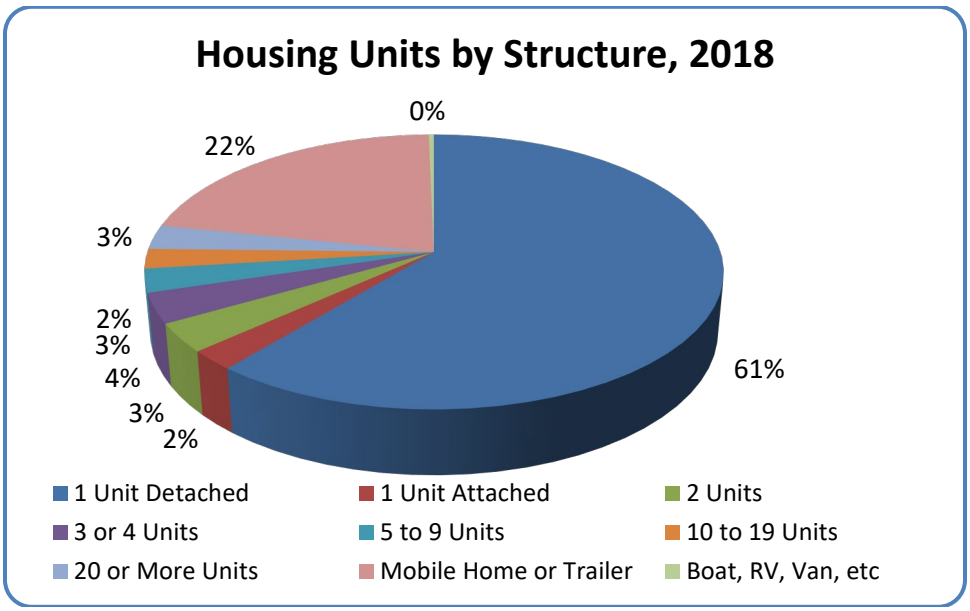


Figure IV.9: Housing units by units in structure; Source: American Community Survey, 2018 5-Year Estimate

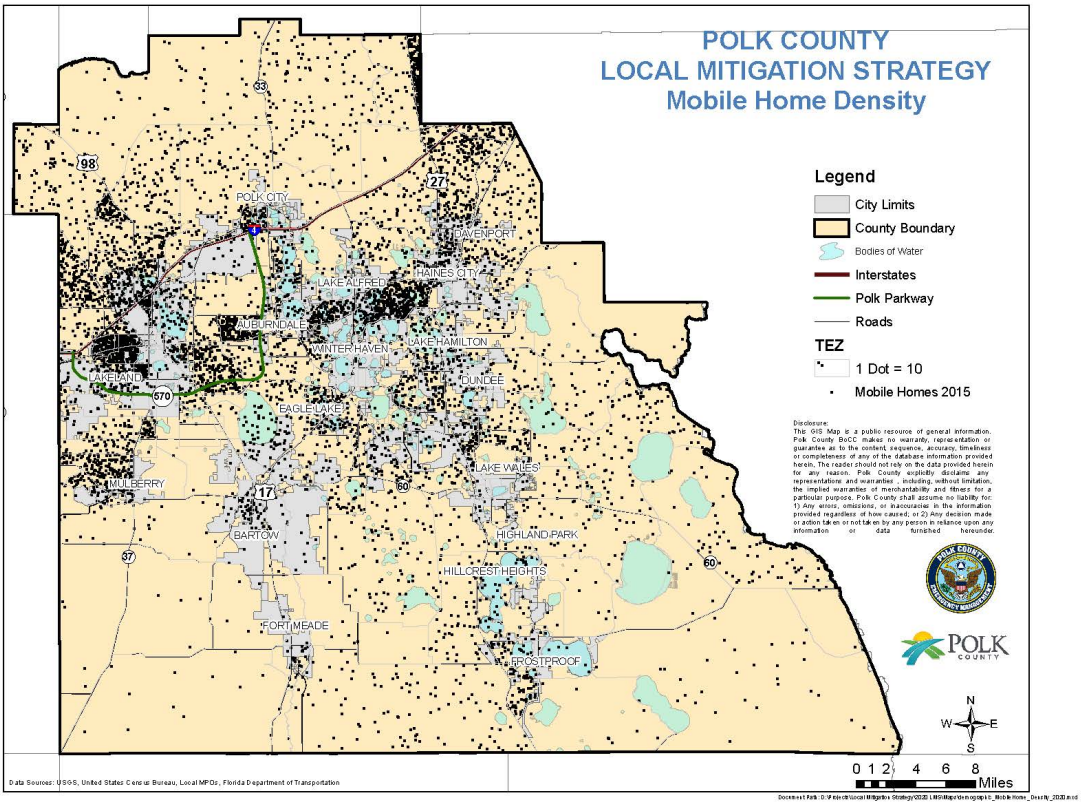


Figure IV.10: Mobile home density

According to American Community Survey data, approximately 71 percent of housing structures in Polk County are over 50 years old (constructed prior to 1970). The three municipalities with the highest vacancy rates are Highland Park (38.1 percent), Fort Meade (29.3 percent), and Lake Hamilton (28.8 percent). The three municipalities with the lowest vacancy rates are Polk City (10.0 percent), Auburndale (12.5 percent), and Lake Alfred (12.6 percent).

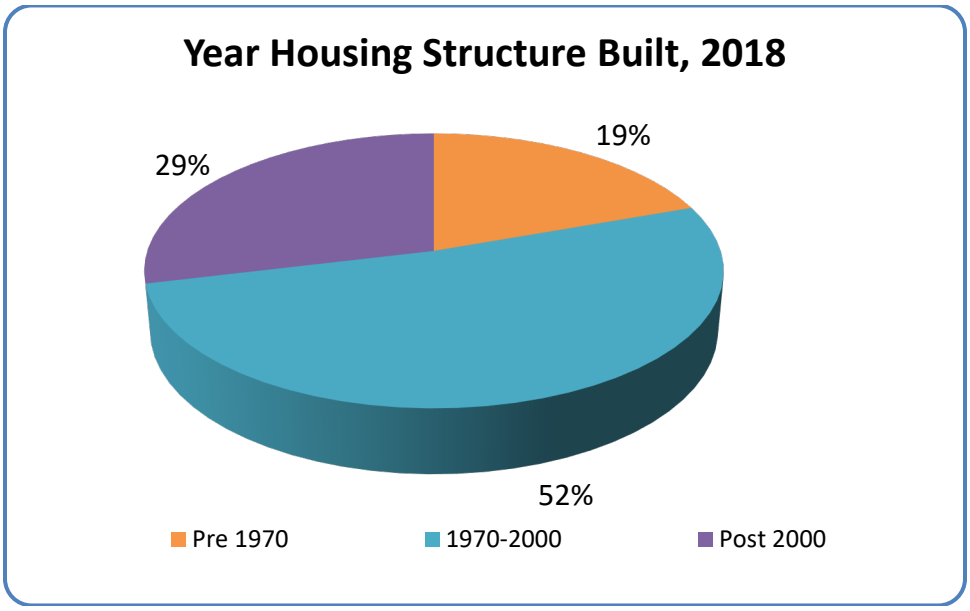


Figure IV.11: Year housing structure built; Source: American Community Survey, 2018 5-Year Estimate

TABLE IV-3:
VACANCY AND OCCUPANCY STATUS, 2014-2018 5-YEAR ESTIMATE

Municipality	Occupied	Vacant	Total	Vacancy Rate (%)
Auburndale	5,314	760	6,074	12.5
Bartow	6,534	1301	7,835	16.6
Davenport	1,211	482	1,693	28.5
Dundee	1,256	354	1,610	22.0
Eagle Lake	792	134	926	14.5
Fort Meade	1,968	815	2,783	29.3
Frostproof	1,136	398	1,534	25.9
Haines City	6,989	2,359	9,348	25.2
Highland Park	91	56	147	38.1
Hillcrest Heights	91	36	127	28.3
Lake Alfred	2,053	297	2,350	12.6

Lake Hamilton	491	199	690	28.8
Lake Wales	5,818	990	6,808	14.5
Lakeland	40,938	8,384	49,322	17.0
Mulberry	1,518	456	1,974	23.1
Polk City	834	93	927	10.0
Winter Haven	14,631	2,949	17,580	16.8
Incorporated Polk Total	**91,665**	**20,063**	**111,728**	**18.0**
Unincorporated Polk Total	139,595	40,473	180,068	22.5
Total County	**231,260**	**60,536**	**291,796**	**20.7**

Source: US Census Bureau, American Community Survey 2018 5-Year Estimate, Table DP04

Infrastructure

The Polk County 2020 Multi-Jurisdictional Local Mitigation Strategy categorizes infrastructure as transportation and utilities since these elements are imperative during a disaster event, for evacuation and response and recovery efforts.

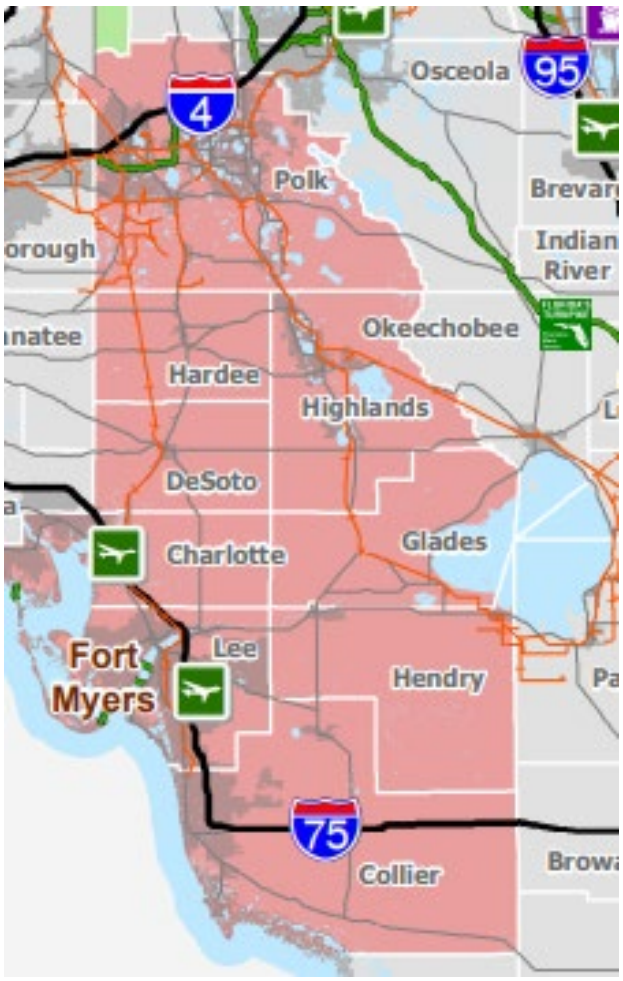


Figure IV.12: Identified area for potential southwest-central Florida connector; Source: FDOT Floridamcore.com

Transportation

Federal Interstate 4 traverses Polk County, running southwest to northeast connecting Hillsborough County to the west and Osceola and Orange Counties to the east. Four Federal highways (US 17, US 98, US 27, and US 92) run through Polk County. Several of these roads serve as evacuation routes. There are 748 miles of evacuation routes mapped in the County.

On May 17, 2019, Governor Ron DeSantis signed the Multi-Use Corridors of Regional Economic Significance (M-CORES) program into law. The program authorizes design and construction of three new tolled road corridors through rural Florida, including the Southwest-Central Florida Connector that will extend from Collier County to Polk County. Figure IV.12 illustrates the potentially-impacted counties for this project.

There are 250 bridge crossings in Polk County, the majority of which are in unincorporated areas. Of the municipalities, Lakeland has the majority with 22.4 percent of the County's bridge crossings.

TABLE IV-4:
NUMBER OF BRIDGES CROSSINGS OVER ROADS IN POLK COUNTY

Municipality	Number of Bridges	Percent (%) of County
Auburndale	4	1.6
Bartow	10	4.0
Fort Meade	1	0.4
Frostproof	1	0.4
Haines City	3	1.2
Lake Wales	6	2.4
Lakeland	56	22.4
Polk City	3	1.2
Winter Haven	8	3.2
Incorporated Total	**92**	**36.8**
Unincorporated Total	158	63.2
Total County	**250**	**100.0**

Source: Bureau of Economic and Business Research, Table 1: Estimates of Population by County and City in Florida: April 1, 2019

Appendix A includes maps illustrating the evacuation routes in the County and bridge locations.

There are also two major railway transportation providers, Amtrak and CSX, and one international airport, Lakeland Linder Regional Airport. Two additional international airports, Tampa and Orlando, are located within an hour's drive of Polk County.

Utilities

Duke Energy Florida, Lakeland Electric, Tampa Electric Company, City of Bartow, City of Fort Meade, Peace River Electric Cooperative, and Withlacoochee River Electric Cooperative, Inc. serve the electricity needs in Polk County. The natural gas suppliers include Florida Public Utilities (Central Florida Gas) and TECO Peoples Gas. Potable water, wastewater, and stormwater utility services include different sources: Polk County Utilities and municipal governments. As infrastructure systems age, utilities can potentially fail due to stress and/or design constraints where the system is unable to handle increased service demands.

Figure IV.13: Sinkhole/Depression middle of Kathleen Road September 2012; Source: The Ledger

Employment and Industry

Employment projections are forecasts of future employment levels for industries and occupations in Florida. The Long-term Employment Projections program of the Florida Department of Economic Opportunity (DEO) provides estimates of current and projected employment by industry and occupation for eight years into the future. The projections include rankings of the fast-growing industries and occupations. In 2019, most employees in Polk County (Workforce Region 17), worked in the Trade, Transportation, and Utilities industries, followed by the Education and Health Services, and the Professional and Business Services industries. By 2027, DEO projects these three industries remain the industries with the most employees. The Education and Health Services and Professional and Business Services industries are among the top three industries and continue to have a high growth rate. The Leisure and Hospitality industry has the highest growth rate. DEO projects the Agriculture, Forestry, Fishing, and Hunting and the Mining industries to have negative growth rates as jobs in these fields are declining. Figure IV.13 shows the three industries with the projected highest and lowest percent changes in jobs from 2019 to 2027.

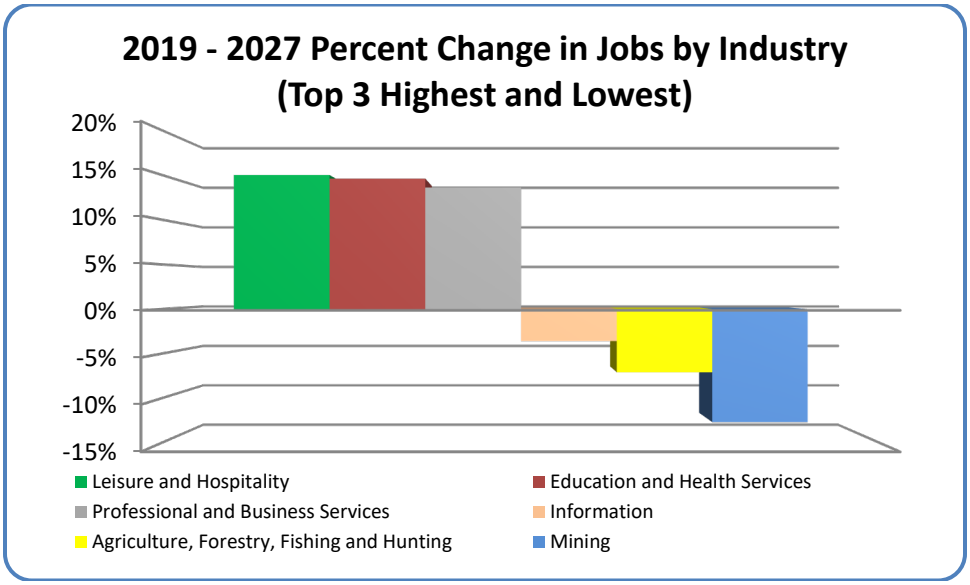


Figure IV.13: Percent change in jobs; Source: Florida Department of Economic Opportunity

Approximately 55 percent of Polk County's population is in the labor force and 51 percent is employed (Table IV-5). As of November 2019, there are 18 employers with over 1,000 employees. The Polk County Public Schools and Publix Super Markets have the most employees with over 12,000 each (Table IV-6).

TABLE IV-5:
EMPLOYMENT STATUS FOR 2018 ESTIMATED POPULATION OVER 16 YEARS OLD

Employment Status	Area in Labor Force	Population	Percent (%) of Total
In Labor Force		294,271	54.95
	Armed Forces	376	0.07
	Civilian – Employed	273,691	51.11
	Civilian – Unemployed	20,204	3.77
Not in Labor Force		219,220	40.93
Total Population		**535,543**	**100.00**

Source: US Census American Community Survey 2018 5-Year Estimate, Table B23025

TABLE IV-6:
TOP EMPLOYERS WITH OVER 1,000 EMPLOYEES IN POLK COUNTY, NOVEMBER 1, 2019

Company Name	Primary Industry	Total Employees
Polk County Public Schools	Administration, Staff and Educators	13,235
Publix Super Markets	Headquarters, Distribution, Manufacturing and Super Markets	12,500
Lakeland Regional Health	Main Hospital and Clinic Operations	5,575
Walmart	E-commerce, Distribution and Retail Stores	4,250
Geico	Insurance Center	3,700
City of Lakeland	All City Operations	2,800
Winter Haven Hospital	Main Hospital and Clinic Operations	2200
Polk County Board of County Commissioners	All County Operations	1,864
Watson Clinic	All Clinic Operations	1,857
Polk County Sheriff's Office	Administration, Staff and Deputies	1,751
Advent Health	Hospital Locations and Services	1,550
Legoland	Legoland Florida Resort and Hotels	1,500+
Mosaic	Manufacturing and Office Operations	1,353
Polk State College	Administration, Staff and Educators	1,200
Southeastern University	Administration, Staff and Educators	1,072
Lowe's	Distribution Center	1,056

Saddle Creek Logistics	All Logistic Operations	1,050
GC Services	All Call Center Operations	1,000

Source: Central Florida Development Council

Land Use and Development Trends

Polk County

The Polk County Land Development Code defines development as "any man-made change to improved or unimproved real estate" and states that development means "any building activity or material change in the use or appearance of any structure or land". It is a broad definition, and accordingly, the Office of Planning and Development includes a broad range of staff disciplines. County divisions include the Building, Land Development and Long-Range Planning Divisions. The Long-Range Planning Division serves as staff to the Polk Transportation Planning Organization. In addition to strategic land use and transportation planning, these Divisions review and permit both horizontal (site improvements) and vertical (building) construction.

From the Green Swamp in the north, to riverine systems in the south, to the globally imperiled scrub of the Lake Wales Ridge to the east, Polk County's natural features are diverse. According to the Florida Fish and Wildlife Fish Commission, the Lake Wales Ridge includes scrub, which is "home to one of the rarest collections of plants and animals in the world". A network of preserves protects many of these species.

There are 1,287,249 acres of land in unincorporated Polk County. The map below illustrates the Future Land Use designations in the unincorporated County in 2019. Much of the land remains in active agriculture use.

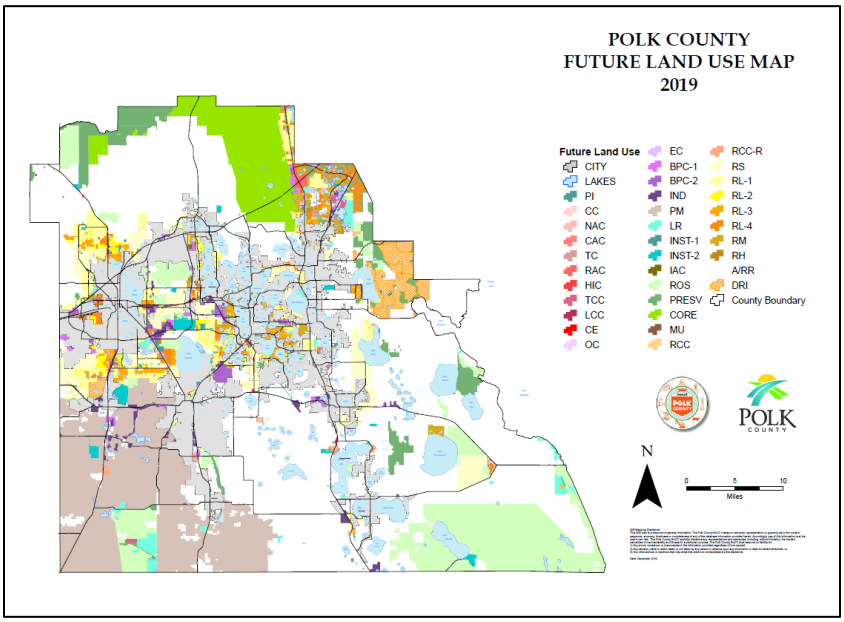


Figure IV.14: Polk County Future Land Use Map 2019

Polk County's continued growth underscores the need for planning, quality development, and safe building practices. Over the past 20 years, Polk County has added over 200,000 residents to its permanent population, and BEBR forecasts Polk County's population to approach approximately one million residents by 2045. Over 8.8 million persons currently reside within the Interstate 4 corridor, which will increase to 13.3 million by 2045 – an increase equal to the current population of the State of Oregon.

Polk County is an urbanized County. Over half of Polk County residents live in an urban area, and eight out of ten unincorporated residents live in an urban setting. New development has clustered in expanding urban areas, especially in northeast Polk County, which is the fastest growing area. While Polk County is an urbanized county, large areas of the County are rural or suburban.

The County's population is increasingly diverse. In 2016, the minority population, primarily African American and Hispanic Latino, accounted for 38 percent of the total population. In northeast Polk County, one in four residents are Hispanic Latino and one in four residents speak a language other than English at home.

Municipalities within Polk County

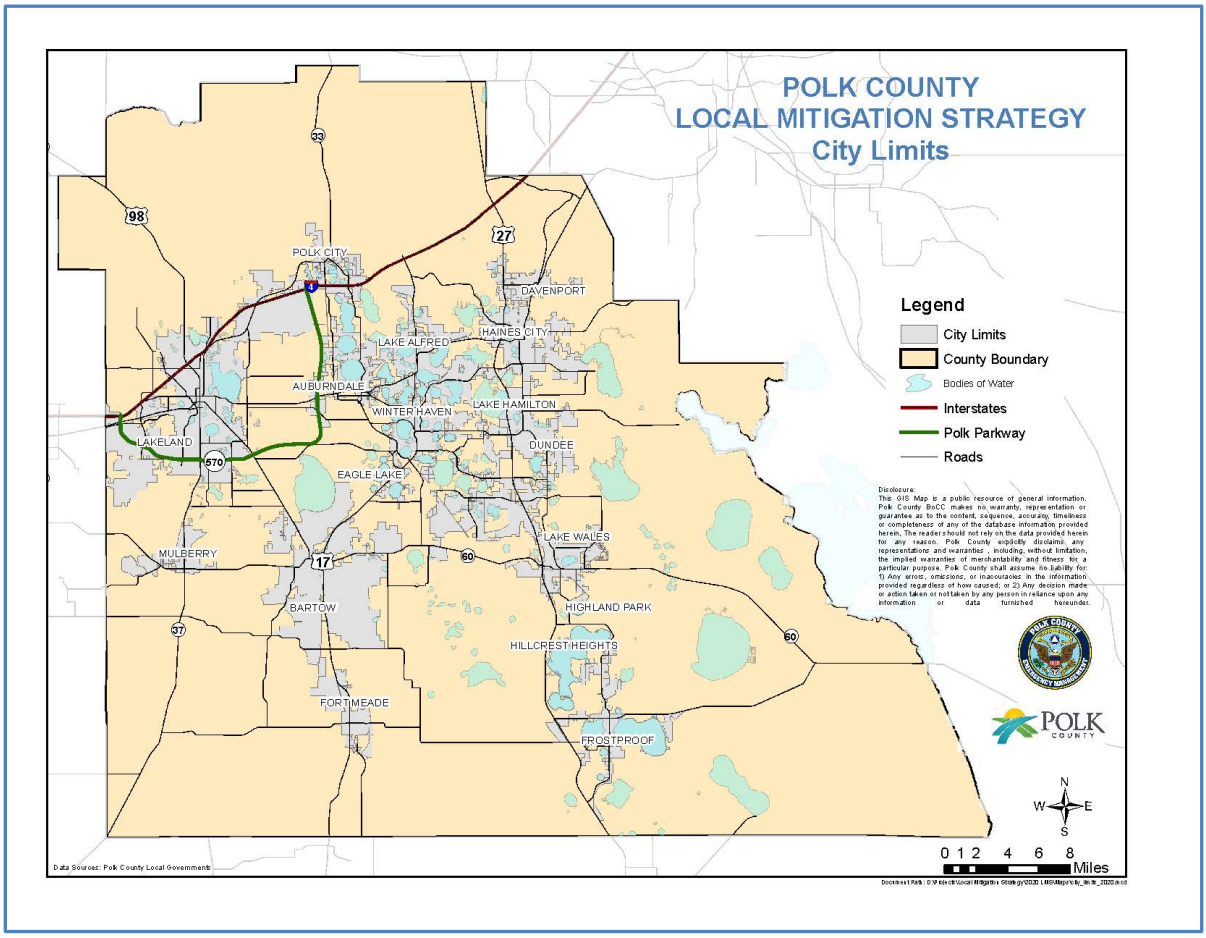


Figure IV.15: Polk County municipalities

Auburndale

The City of Auburndale, located in north central Polk County, is the fifth-largest city in population according to the most recent estimates for the County's 17 municipalities. The city is situated mostly south of the Green Swamp Area of Critical State Concern and lies between Lakeland and Winter Haven. US 92 traverses east and west through the southern part of the city, while Interstate 4 runs east and west through the north part of the city.

Auburndale's historical development centered along, and radiated from, the railroad line that runs through the city's downtown area. The city has preserved the downtown core area as a vibrant focal point for retail and services, city administrative offices, the civic center, a park, and recreation facilities. Two areas of industrial land use concentrated along the railroad on the east and west sides of downtown. Auburndale High School, Stambaugh Middle School, and Auburndale Central Elementary School are located on the periphery of the downtown core.

The oldest residential areas in Auburndale are located contiguous to the downtown area on four sides. As Auburndale developed, the residential land use pattern formed in a ring around Lake Ariana, north and west of downtown. More recent residential growth is occurring in annexed areas further north, east and west of SR 559, up to CR 559A. Lot sizes typically become larger, and density lower, as distance from the core area increases.

Auburndale and Polk County have established a Joint Planning Area (JPA) geographically based on the city's Utility Service Area. The JPA establishes Polk County's intention to render land use approvals that are consistent with the Auburndale's future land uses and vision of the future. The JPA facilitates the integration of properties in the Auburndale Utility Service Area as people annex them into the city. Planned land uses include Tourism Commercial Centers that support the sports complex and the Interstate 4 Corridor Gateway to the city. In addition, the JPA will support the Florida Polytechnic University and the developing technology corridor along Interstate 4. (Auburndale Evaluation and Appraisal Report)

Bartow

The City of Bartow, the county seat of Polk County, lies south of Lakeland on US 98 and SR 60. The County's courthouse and administrative offices are adjacent to the downtown core. Downtown Bartow is the historic center of retail shopping and business services and remains a vibrant hub of commercial and government activity. East and south of downtown are historic homes in historic districts. Extending out from the city's core, primarily to the southeast, southwest, and northwest, is most of Bartow's residential development. As distance from the core increases, lot sizes are larger and densities are lower.

There is a concentration of highway-oriented commercial activity and shopping centers near the intersection of US 98 (North Broadway Avenue) and SR 60 (Van Fleet Drive) north of downtown and radiate along US 98 northwest to the city Limits. Most of Bartow's industrial development is located west of the downtown area and along SR 60 West, and south and east of downtown along US 17. Since 2000, other than infill development, urban growth has taken place in residential subdivisions to the northwest along Lyle Parkway and EF Griffin Road, on the south end of the city, and most recently in the vicinity of Old Bartow – Eagle Lake Road east of US 98. Growth in the US 98 corridor includes Bartow Memorial Hospital and a major vehicle dealership.

Much of Bartow is land area consisting of post-phosphate mining land reclamation and agricultural activities, which Clear Springs Land Company, LLC owns. The Bartow City Commission approved the Clear Springs Sector Plan (CSSP) which includes a Conceptual Plan Overlay containing a mix of urban development, rural development, recreation/open space, and conservation. This property borders both sides of the Peace River. The CSSP project offers a unique opportunity for industrial and commercial development in Bartow. (Bartow Evaluation and Appraisal Report)

Davenport

The City of Davenport is approximately 3.88 square miles located in northeastern Polk County, situated along the US 17/92 corridor, south of Interstate 4, and east of US 27. Existing development occupies the heart of Davenport with commercial and industrial uses located along US 17/92. The city approved more than 2,000 new residential units for development in the city, located mostly in new residential subdivisions east of US 27 and west of US 17/92. Many of the approved subdivisions are located along CR 547, the major east/west roadway corridor that traverses the city.

Davenport is located directly south of Polk County's North Ridge Selected Area Plan in which the County has intensified the land uses in the unincorporated areas from agriculture to medium density residential, business park center, tourism commercial center, and industrial as well as leisure recreation uses. Ernie Caldwell Boulevard is located north of Davenport and south of Interstate 4 and connects US 27 east to US 17/92, providing a needed east/west connector roadway in northeast Polk County. (Davenport Evaluation and Appraisal Report)

Dundee

The Town of Dundee is situated on the eastern ridge of the County, south of Haines City and Lake Hamilton, and east of Winter Haven. US 27 runs north and south through the west side of the town while SR 17 runs north and south through the core of the town. Existing development has occurred in the downtown. Large areas of active agricultural lands remain in the northeast and southeast sections of the community. The Town is planning for future development potential of the annexed active agricultural lands.

Dundee and Polk County recognize that intergovernmental coordination is essential for growth management and engaged in a joint effort to comprehensively plan certain areas within the town limits, as well as areas located in unincorporated Polk County. Dundee and Polk County worked together to develop the East Polk Selected Area Study (SAS). The East Polk SAS is a joint planning study that includes lands within the Dundee, its utility service area, and some of the surrounding unincorporated areas. The East Polk SAS establishes Dundee and Polk County's intention to render land use approvals consistent with the vision of the future as developed through the process. (Dundee Evaluation and Appraisal Report)

Eagle Lake

The 3.75 square mile City of Eagle Lake is located approximately 45 miles southwest of Orlando and approximately 43 miles east of Tampa. US 17 is the major highway serving the city.

Eagle Lake has a small central business district centered around the US 17 corridor which includes commercial, industrial, and government buildings. The city is close to the Bartow Executive Airport and related industrial development areas. The city has recreational opportunities including access to Eagle Lake and Lake McLeod. The city's original core area includes primarily residential development. The one-

way pairs of US 17 bisect the core of the downtown. A commercial corridor extends the US 17 corridor including within the large median created by the one-way pairs with few remaining residential properties in that area. (Eagle Lake Evaluation and Appraisal Report)

Fort Meade

The City of Fort Meade, the oldest city in Polk County, has valued its history dating back to 1849. The city developed within a compact area, generally square in shape, with the Peace River forming its eastern border and the western border stopping at mining company-owned lands. The city established the northern boundary along 9th Street North and the southern boundary along 9th Street South. In recent years, the city expanded beyond these historical boundaries to welcome industrial, commercial, and residential opportunities. To the north, the city annexed along US 17/98 to take in commercial and industrial properties. To the south, the city has annexed various properties, mostly residential in nature. The city crosses the Peace River to the east, primarily to annex the proposed 120-acre Fort Meade Outdoor Recreation Area along the eastern shore of the river.

To retain its historical small-town charm, Fort Meade has preserved its historical downtown area along West Broadway Street from US 17 west to the CSX railroad track. The city has concentrated commercial development and growth along the road frontage of US 17 spanning north to south of the city limits. Historical downtown and highway commercial on US 17 surround Fort Meade's residential areas. Residential development extends toward the city's northern, southern, and eastern borders. Neighborhood commercial uses serve residential areas along East Broadway Street and Dr. Martin Luther King Jr St SW between US 17 and French Avenue South. The city is working with developers to attract commercial opportunities that serve the residents of Fort Meade, while keeping the attractiveness of a small-town that provides residential, recreational, and commercial opportunities that residents enjoy.

Frostproof

The City of Frostproof is situated in an area of Florida known as the "Ridge" for its long, rolling sand and limestone hills. The 26,000-acre Lake Wales Ridge State Forest is located east of Frostproof. The Nature Conservancy's Tiger Creek Preserve, which consists of 4,805 acres of protected lands located to the north and east of Frostproof and includes the pristine blackwater stream that forms the spine of the preserve. The 106,000-acre Avon Park Air Force Range is located southeast of the city. Pasture land, citrus groves, and retirement communities surround the remainder of the city. US 27 parallels the western side of the city while SR 17 (Ridge Scenic Highway) runs north and south through the center.

Most of the existing development has occurred between Lake Clinch and Lake Reedy and along the Ridge Scenic Highway, the major north/south collector road that bisects the city. A significant amount of land designated as active agriculture is in the north, south, and east areas of the city. The city is planning development for these areas including a residential development north of CR 630A, east of SR 17. Industrial lands east of Silver Lake and directly east of the SR 17 have developed with the location of Ferguson Enterprises, Inc. Distribution Center. Lowe's Flatbed Distribution Center is located south of Ferguson with direct access to the rail spur. Several properties in this area are ready for development, as utilities and a rail spur service the area.

Three schools are located within the city limits: Ben Hill Griffin Elementary; Frostproof Elementary; and Frostproof Middle/Senior High School. The schools are located north of CR 630, west of SR 17.

Haines City

The City of Haines City is in northeast Polk County, approximately 40 miles southwest of Orlando. The city is bounded by the municipalities of Davenport to the north, Lake Alfred to the west, and Lake Hamilton to the south. Poinciana is to the east. Haines City is located at one of the major transportation crossroads in Polk County including US 27, US 17/92, and SR 17, which all pass through the downtown area. Located along the rapidly developing US 27 corridor, the city has undergone significant residential and commercial growth in recent years, expanding to include approximately 13,496 acres (21.1 square miles).

The city's historic downtown area is located east of US 27. A series of older neighborhoods surround the downtown area. More recent residential and commercial development has occurred outside the traditional city along major roadways. Parts of the city remain agricultural, with citrus and pasture. (Haines City Evaluation and Appraisal Report)

Highland Park

The Village of Highland Park is located within the eastern ridge of the County, south of Lake Wales and north of Frostproof. State Road 17 and the Ridge Scenic Highway run north and south along its western boundary. Development is located on the north side of Lake Easy and surrounding Lake Amoret. A large area of Highland Park consists of a golf course, and several Village lots line the course.

With 107 platted lots originally recorded in 1919, today Highland Park is comprised of 113 residences. The Village has no plans at the present to further expand its boundaries. However, individual property owners have expressed interest in changing their property use to allow higher densities, and changing the land development code to allow redevelopment of existing uses in case of natural disaster. (Highland Park Evaluation and Appraisal Report)

Hillcrest Heights

The Town of Hillcrest Heights is a small residential community in southeastern Polk County, located 7 miles south of Lake Wales and 5 miles north of Frostproof.

Residential is the most predominant land use within Hillcrest Heights. Approximately, 68.9 acres of the total 100.9 acres are single-family residential units. There are no commercial or industrial land uses and there is no land designated or zoned for such purposes. The town has no plans to expand its boundaries. With 4.79 acres of undeveloped land in the town limits, new development will be minimal. (Hillcrest Heights Evaluation and Appraisal Report)

Lake Alfred

The City of Lake Alfred covers approximately 13 square miles in northeastern Polk County along the US 17/92 corridor, south of Interstate 4 and west of US 27. The northern half of the city is in the Green Swamp Area of Critical State Concern.

The city has experienced significant residential development due to its proximity to Walt Disney World, LEGOLAND, and other major tourist attractions in central Florida and the greater Orlando area. Developers have built numerous subdivisions in the city on land formerly used for citrus production. Lake Alfred is developing a commercial district highlighted by an antique market and expanding retail and restaurant services. The city has a growing industrial base fueled by the citrus industry, trucking, a distilling and bottling operation, and established contracting businesses. In 2009, the Florida Department of Transportation constructed one-way pairs on US 17/92 through the heart of downtown,

to reduce traffic congestion while providing for an increase in commercial opportunities to serve the growing population.

Development in Lake Alfred includes residential development east and west of the commercial corridor along US 17/92. The CSX railroad mainline divides the northern and southern portions of the city. At the south entrance to the city, US 17 (from Winter Haven) and US 92 (from Auburndale) converge and become US 17/92. Business commercial development in Lake Alfred is within a block of this thoroughfare. The historic downtown business core is at the intersection of Lake Shore Way (US 17/92) and Haines Boulevard. The city's government center is also located here. Older residential areas are located east and west of the corridor, extending to Lake Haines on the east side and Lakes Cummings and Echo on the west. New residential areas expand the city to the west.

There are a few older residential neighborhoods in the Lake Swoope/Twin Lakes area located on the north side of the CSX railroad. Continuing northward, developers are planning newer single-family residential subdivisions, mainly in an area lying within the Green Swamp Area of Critical State Concern, which limits densities to three units per acre. This area of future growth connects to the center of Lake Alfred by SR 557, the city's primary access to Interstate 4 to the north. These northern areas, and the area along Lynchburg Road west of the 1999 city limits, are where most annexations in Lake Alfred have taken place in the last decade. Along the CSX railroad is Lake Alfred's industrial land use base. The industrial area is expanding to the east where Polk County is planning a new Polk County Government Center to serve the growing area.

Lake Hamilton

The Town of Lake Hamilton is situated on the Lake Wales Ridge, south of Haines City, east of Winter Haven, and north of Dundee. The town is located near Lake Hamilton, which is part of the headwaters for the Peace River. Of the approximately 4.17 square miles of area within the town limits, approximately 0.98 square miles is water, including the town's namesake Lake Hamilton. Six major lakes lie within the community: Crystal Lake, Lake Gordon, Lake Ida, Lake Sara, Lake Lee, and Lake Hamilton.

The town accesses both the Ridge Scenic Highway and US 27, a major north-south arterial roadway through Polk County. Development has occurred along US 27 primarily around the Haines City and Lake Wales. The town anticipates development patterns and pressures to continue along the US 27 corridor.

Lake Hamilton is typical of the many small communities which sprang up in central Florida's early history along the State's highways and railroads. The original alignment of US 27 passed through the central portion of the community, giving birth to the initial commercial area and influencing development patterns. A north-south railroad line also passed through the center of town, resulting in the location of the citrus packing plant in the north-central area. The later re-alignment of US 27 along a right-of-way at the town's western edge, and the abandonment of the railroad line dramatically altered the growth and development patterns. Most of the development in Lake Hamilton has occurred in the core area of the town. There has been some development along US 27. The town does not have a wastewater system and therefore, a septic system or partnership with a neighboring municipality must serve any new development. The town is working with neighboring jurisdictions to provide sewer services. (Lake Hamilton Evaluation and Appraisal Report)

Lake Wales

The City of Lake Wales is located at the junction of US 27 and SR 60, approximately 25 minutes south of Interstate 4, and is situated on the Lake Wales Ridge. To the east is Lake Kissimmee and the Kissimmee River. The city can support growth, as over half of the land in the city is vacant and intended for residential development. Undeveloped residential tracts are located southeast of Thompson Nursery Road and US 27, northeast of Chalet Suzanne Road and US 27, and areas south of SR 60. Citrus has been a mainstay of the economy. In recent years light manufacturing, construction, and electronics firms have added diversity to the economy. (Lake Wales Evaluation and Appraisal Report)

Lakeland

The City of Lakeland corporate limits encompass approximately 75 square miles and have remained relatively stable over the past decade. Lakeland is the most populous municipality in Polk County, with an estimated population of 107,552 as of April 1, 2019. This estimate is 1,966 persons higher than the prior year, and 10,130 persons higher than the 2010 Census. This represents a 1.86 percent growth rate which is a slightly above average annual increase for Lakeland. Relatively low real estate values, compared to Tampa and Orlando metro areas, and increased job opportunities, due to the city's prioritization of economic development spurred the city's population growth. Lakeland's economic base consists of warehousing, transportation and distribution, education, health care, and manufacturing and retail. The city expects the job market to increase by 42.5 percent over the next 10 years. This growth will outpace the national average by approximately 20 percent.

Construction of new residential units to accommodate growth is occurring through a combination of new residential subdivisions in the suburban area, Infill development is occurring on existing lots within the central city. In 2019, the city permitted 1,309 new residential units with 1,231 net new units after demolitions. However, new single-family units, particularly within the southwest part of the city, dominate residential permitting. During the same time, non-residential development totaled 8,800 permits authorizing $720 million in construction value. Warehousing and distribution uses driven by the advancement of e-commerce and Lakeland's strategic location between Tampa and Orlando dominate non-residential development. The large building and associated vehicle/truck parking areas needed to support this industry have resulted in equally expansive impervious areas and a growth pattern that consumes large greenfield tracts.

Mulberry

The City of Mulberry, located in the southwestern portion of Polk County, is 10 miles west of Bartow and 10 miles south of Lakeland. Historically, the city grew from the late 19th century phosphate mining industry and considers itself the "Phosphate Capital of the World". The Mosaic Company is the largest phosphate producer in the world and has a major presence in Mulberry.

The city is home to manufacturing and warehousing facilities for Badcock Corporation, a large furniture and appliance retailer. All commercial and industrial businesses are in the vicinity of two major highways, SR 37 and SR 60, which intersect in the city. The historic core centers around this intersection. Older commercial structures and the city's government center are located here. Highway commercial-type uses line SR 60 from east to west. Two of Mulberry's three industrial areas are near SR 60, one on the east entrance to the city, and the other on the western edge, being the location of the Prairie Industrial Park. A third industrial area lies along Mulford Road west of SR 37. Most of SR 37 runs north of SR 60, toward the south Lakeland area. Smaller businesses line SR 37. Further north, where SR 37 intersects Carter Road and Shepherd Road, is Mulberry's growth area for retail commercial properties.

Mulberry's residential areas are in all quadrants surrounding the city's historic center. Located here are older, developed neighborhoods. Many of the older homes in some areas are beginning to show signs of structural deterioration. Except for a new residential subdivision on SR 37, little new residential growth has occurred since 1990.

Rail lines crisscross the city in all directions. Most of the train traffic on these lines serve phosphate mining and related activities to the south of the city. Mulberry surrounds early phosphate mining extraction sites which have left a series of man-made lakes and channels within urban and outlying portions of the city. (Mulberry's Evaluation and Appraisal Report)

Polk City

Polk City, located in north central Polk County, near the intersection of SR 33 (Commonwealth Boulevard) and SR 655 (Berkley Road). Polk City is located within the Green Swamp Area of Critical State Concern. A portion of the city is in the Polk City Exemption Area, which is exempt from the regulations of the Green Swamp.

The city anticipates growth due to the city's location along Interstate 4 between Tampa and Orlando. Older residential properties and mixed uses surround the downtown area. Redevelopment and infill development are occurring. There is a substantial amount of vacant developable property, much of which Polk City has annexed since 2000. (Polk City Evaluation and Appraisal Report)

Winter Haven

The City of Winter Haven, located in central Polk County, lies along one of the ridges that runs north/south along the Florida peninsula. The city is located approximately 12 miles south of Interstate 4 and five miles east of the Polk Parkway (SR 570). Within or touching the city is a 24-lake "Chain of Lakes" connected by a series of canals dating to the early 20th century. The original purpose of connecting the lakes was to ship citrus from groves to packing plants located along railroad lines. Today, the Chain of Lakes serves as a recreational amenity for residents and visitors. In addition to the interconnected lakes, there are 29 isolated lakes in and around the city. Primary access to the city is via US 17, US 27, and US 92, as well as SR 60, SR 540, SR 542, SR 544, and SR 655.

Winter Haven serves as the center of a regional market that extends throughout eastern Polk County and south to Hardee and Highlands counties. Employment in Winter Haven includes a wide range of professional, service, office, government, and manufacturing jobs. With the city's location midway between the Tampa and Orlando metro areas, a portion of residents leave the area for employment. Winter Haven is also home to a significant number of retirees, many of whom have moved from outside of the area.

The area served by city utilities is approximately 65 square miles. Future expansion of the utility service area to the south will add approximately 12 square miles. Over the past 10 years, the city's area has increased by an average of 69 acres annually; however, in recent years, the pace of outward expansion has slowed, and most annexations now focus on infill development closer to the city's historic boundaries.

Over the past 10 years, construction of new single-family housing units has dominated development. Since 2010, the city has approved nearly 3,800 single-family units for construction. Other significant

development activity includes tourist-related uses near the LEGOLAND theme park; continued redevelopment of the downtown, particularly with new housing; redevelopment and expansion of the Chain of Lakes Complex; and continued industrial growth on lands surrounding CSX Integrated Logistics Center located north of SR 60 along Logistics Parkway. The city expects development to continue at an accelerated pace around these focal points. Based on past development patterns and the amount of undeveloped land in the city, sufficient land is available to accommodate new development through the remainder of the decade.

Development Changes

As Polk County's population grows, the need for expanding and improving mitigation techniques grows exponentially. Municipalities continue to annex land and developers turn former agricultural land into housing. Infrastructure throughout the County is aging, which leads to increased impacts from hazard events. Development in the 100-year flood risk area meet the strict National Flood Insurance Program (NFIP) floodplain management standards. Comprehensive Plan policies and permitting processes help protect wetlands. These actions result in more disaster-resistant communities. An informed and educated populace is a necessity. As growing demands continue to challenge first responders and resources, it is imperative that Polk County residents are knowledgeable and prepared to face and recover from disasters. Providing information and training to Polk County residents helps save lives, spares property, and helps return life to normal more rapidly after a disaster.

National Flood Insurance Program Compliance and Community Rating System Participation

National Flood Insurance Program

The NFIP is a Federal program created by Congress to mitigate future flood losses nationwide through community-enforced building and zoning ordinances and to provide access to affordable, Federally backed flood insurance protection for property owners. The NFIP provides an insurance alternative to disaster assistance to meet the escalating costs of repairing damage to buildings and their contents caused by floods.

Participation in the NFIP is based on an agreement between local communities and the Federal government stating that if a community adopts and enforces a floodplain management ordinance to reduce future flood risks to new construction in Special Flood Hazard Areas (SFHAs), the Federal government will make flood insurance available within the community as a financial protection against flood losses. Table IV-7 includes the National Flood Insurance Program participation status of Polk County municipalities.

TABLE IV-7
NATIONAL FLOOD INSURANCE PROGRAM PARTICIPATION

Community Name	NFIP Status
Auburndale	Participating
Bartow	Participating
Davenport	Participating
Dundee	Participating
Eagle Lake	Participating
Fort Meade	Participating
Frostproof	Participating
Haines City	Participating
Highland Park	Not Participating
Hillcrest Heights	Not Participating
Lake Alfred	Participating
Lake Hamilton	Participating
Lake Wales	Participating
Lakeland	Participating
Mulberry	Participating
Polk City	Participating
Winter Haven	Participating
Unincorporated Polk County	Participating

Source: National Flood Insurance Program Community Status Book, Updated September 24, 2019

Through the NFIP, each participating municipality will:

1. Continue to enforce its adopted Floodplain Management Ordinance requirements, which include regulating all new development and substantial improvements in SFHA;
2. Continue to maintain all records pertaining to floodplain development, which shall be available for public inspection;
3. Continue to notify the public when there are proposed changes to the floodplain ordinance or Flood Insurance Rate Maps;
4. Maintain the map and Letter of Map Change repositories; and
5. Continue to promote flood insurance for all properties.

The Village of Highland Park and the Town of Hillcrest Heights have chosen not to participate in the NFIP. The municipalities cite their size, limitation of resources, and location as reasons not to participate. According to the April 1, 2019 Estimate of Population by BEBR, Highland Park has 263 people and Hillcrest Heights has 256 people. With such small populations, they have limited resources and manpower. They also are small municipalities and most land and structures do not lie within the 100-year floodplain.

TABLE IV-8
NFIP INSURANCE POLICIES AS OF SEPTEMBER 30, 2018

Municipality	Policies in Force	Total Premium ($)	Total Coverage ($)	Since 1978	
				Total Claims*	Total Paid* ($)
Auburndale	69	26,644	19,539,000	15	58,876
Bartow	62	35,621	14,752,500	7	86,392
Davenport	52	25,539	13,419,100	4	3,439
Dundee	26	17,524	7,676,300	4	3,510
Eagle Lake	9	3,198	2,730,000	0	0
Fort Meade	6	1,518	980,000	3	0
Frostproof	16	9,401	3,971,100	2	75,300
Haines City	106	43,304	21,641,800	15	138,930
Lake Alfred	22	9,945	4,050,600	0	0
Lake Hamilton	6	3,689	2,250,000	2	12,042
Lake Wales	96	39,296	28,761,100	7	35,274
Lakeland	931	437,385	210,269,800	48	178,462
Mulberry	46	26,780	9,818,800	2	12,006
Polk City	10	3,730	2,686,000	0	0
Winter Haven	401	163,852	104,082,800	40	250,487
Unincorporated Polk County	6,074	3,106,261	1,468,827,900	667	**7,539,137**

* Claim information from January 2018

Sources: Flood Policy Information by State and Community, FEMA, Data as of June 30, 2019

Florida Division of Emergency Management via Appendix F 2018 Florida Enhanced State Hazard Mitigation Plan, August 2018

Community Rating System (CRS)

The NFIP's Community Rating System (CRS) is a voluntary incentive program that recognizes communities for implementing floodplain management practices that exceed the Federal minimum requirements of the NFIP to provide flood protection. Goals of the CRS are to reduce flood damage to insurable property, strengthen and support the insurance aspects of the NFIP, and encourage a comprehensive approach to floodplain management. FEMA developed the CRS 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.

Once a community applies to the appropriate FEMA region for the CRS program and FEMA verifies its implementation, FEMA sets the CRS classification based upon credit points. This classification determines the premium discount for policyholders in the participating community. There are 10 CRS classes: Class 1 requires the most credit points and gives the greatest premium discount; Class 10 identifies communities that do not participate in the CRS or have not earned the minimum required

credit points and receive no premium discount. As recognition of the floodplain management activities instituted in a community, eligible policies written in a community receive premium discounts ranging from 5 percent (Class 9) to a maximum of 45 percent (Class 1).

FEMA recognizes 19 activities as measures for eliminating exposure to floods and assigns credit points to each activity. The activities fall into four main categories: Public Information; Mapping and Regulation; Flood Damage Reduction; and Warning and Response.

More than 1,200 communities from 50 states participate in the CRS. Roseville, CA, is the only CRS Class 1 community. More than 70 communities have a CRS Class 5 or better ranking, resulting in a reduction of premiums for residents in high-risk areas by at least 25 percent. Lakeland, Lake Alfred, and unincorporated Polk County participate in the CRS and have CRS classifications of 7 and 6 respectively (Table IV-9).

TABLE IV-9
COMMUNITY RATING SYSTEM (CRS) ELIGIBLE COMMUNITIES EFFECTIVE OCTOBER 1, 2014

Community Number	Community Name	CRS Entry Date	Current Effective Date	Current Class	Discount for SFHA	Discount for Non-SFHA
120667	Lake Alfred	10/01/08	05/01/19	6	20%	10%
120267	Lakeland	10/01/04	10/01/09	7	15%	5%
120261	Unincorporated Polk County	10/01/92	10/01/11	6	20%	10%

Note: SFHA = Special Flood Hazard Area
Source: Florida Division of Emergency Management October 2019 NFIP Flood Insurance Manual

Polk County Public Schools

Polk County Public Schools' history stretches more than 150 years, to a time when students studied in one-room schoolhouses and the schedule for the strawberry harvest set the school calendar. The Polk County Board of Public Instruction, which later became the Polk County School Board, formed in 1869. By the turn of the century, the school district had grown to over 80 schools — and the growth has not stopped. Today, Polk County Public Schools is one of the largest school districts in the nation, encompassing more than 150 schools and serving more than 100,000 students through both traditional K-12 schools and a variety of other programs.

Polk County Public Schools has a reputation for educational excellence, as evidenced by its more than 20 nationally accredited workforce academies, five Florida Arts Model Schools, and rising number of schools offering Advanced Placement and Cambridge International programs. In 2018, Polk County Public Schools garnered national attention for becoming one of the first districts to launch a School Safety Guardian Program. Developed in conjunction with the Polk County Sheriff's Office, the Guardian Program ensures every campus has either an armed school district employee or law enforcement officer on-site.

As it grows and innovates, Polk County Public Schools remains true to its mission of delivering a high-quality education to every student … because at Polk County Public Schools, students always come first.

Tables IV-10, IV-11, and IV-12 include lists of institutions providing primary and secondary education in Polk County.

TABLE IV-10
ELEMENTARY SCHOOLS WITHIN THE POLK COUNTY SCHOOL DISTRICT

Elementary School	Location
Alta Vista Elementary	Haines City
Alturas Elementary	Alturas
Auburndale Central Elementary	Auburndale
B.E.S.T.	Auburndale
Bartow Elementary Academy	Bartow
Ben Hill Griffin Jr Elementary	Frostproof
Berkley Elementary	Auburndale
Bethune Academy	Haines City
Carlton Palmore Elementary	Lakeland
Chain of Lakes Elementary	Winter Haven
Citrus Ridge: A Civics Academy	Davenport
Clarence Boswell Elementary	Auburndale
Cleveland Court Elementary	Lakeland
Combee Elementary	Lakeland
Crystal Lake Elementary	Lakeland
Cypress Junction Montessori	Winter Haven
Dale R. Fair Babson Park Elementary	Babson Park
Davenport School of the Arts	Davenport
Dixieland Elementary	Lakeland
Doris A Sanders Learning Center	Lakeland
Dr. N.E. Roberts Elementary	Lakeland
Dundee Elementary Academy	Dundee
Eagle Lake Elementary	Eagle Lake
Eastside Elementary	Haines City
Edgar L. Padgett Elementary	Lakeland
Elbert Elementary	Winter Haven
Floral Avenue Elementary	Bartow
Frank E. Brigham Academy	Winter Haven
Fred G. Garner Elementary	Winter Haven
Frostproof Elementary	Frostproof
Garden Grove Elementary	Winter Haven

TABLE IV-10
ELEMENTARY SCHOOLS WITHIN THE POLK COUNTY SCHOOL DISTRICT

Elementary School	Location
Gause Academy of Leadership	Bartow
Gibbons Street Elementary	Bartow
Griffin Elementary	Lakeland
Hartridge Academy	Winter Haven
Highland City Elementary	Highland City
Highlands Grove Elementary	Lakeland
Hillcrest Elementary	Lake Wales
Horizons Elementary	Davenport
Inwood Elementary	Winter Haven
James E. Stephens Elementary	Bartow
James W. Sikes Elementary	Lakeland
Janie Howard Wilson Elementary	Lake Wales
Jean O'Dell Learning Center	Bartow
Jesse Keen Elementary	Lakeland
Jewett School of the Arts	Winter Haven
John Snively Elementary	Winter Haven
Karen M. Siegel Academy	Lake Alfred
Kathleen Elementary	Lakeland
Kingsford Elementary	Mulberry
Lake Alfred Elementary	Lake Alfred
Lake Shipp Elementary	Winter Haven
Lakeland Montessori Schoolhouse	Lakeland
Language and Literacy Academy	Winter Haven
Laurel Elementary	Poinciana
Lena Vista Elementary	Auburndale
Lewis Anna Woodbury Elementary (4-5)	Fort Meade
Lewis Elementary (PK-3)	Fort Meade
Lincoln Avenue Academy	Lakeland
Loughman Oaks Elementary	Davenport
Magnolia Montessori Academy	Lakeland
McKeel Central Academy	Lakeland
Medulla Elementary	Lakeland
North Lakeland Elementary School of Choice	Lakeland

TABLE IV-10
ELEMENTARY SCHOOLS WITHIN THE POLK COUNTY SCHOOL DISTRICT

Elementary School	Location
Oscar J. Pope Elementary	Lakeland
Our Children's Academy	Lake Wales
Palmetto Elementary	Poinciana
Philip O'Brien Elementary	Lakeland
Pinewood Elementary	Eagle Lake
Polk Avenue Elementary	Lake Wales
Polk City Elementary	Polk City
Purcell Elementary	Mulberry
R. Bruce Wagner Elementary	Lakeland
R. Clem Churchwell Elementary	Lakeland
REAL Academy	Lakeland
Ridgeview Global Studies Academy	Davenport
Rochelle School of the Arts	Lakeland
Rosabelle W. Blake Academy	Lakeland
Sandhill Elementary	Haines City
Scott Lake Elementary	Lakeland
Sleepy Hill Elementary	Lakeland
Snively Elementary	Winter Haven
Socrum Elementary	Lakeland
South McKeel Academy	Lakeland
Southwest Elementary	Lakeland
Spessard L. Holland Elementary	Bartow
Spook Hill Elementary	Lake Wales
Valleyview Elementary	Lakeland
Victory Ridge Academy	Lake Wales
Wahneta Elementary	Winter Haven
Walter Caldwell Elementary	Auburndale
Wendell Watson Elementary	Lakeland
Winston Academy of Engineering	Lakeland

Source: Polk County Public Schools; https://polkschoolsfl.com/schoollistings/

TABLE IV-11
MIDDLE SCHOOLS WITHIN THE POLK COUNTY SCHOOL DISTRICT

Middle School	Location
Bartow Middle	Bartow
Berkley Accelerated Middle	Auburndale
Citrus Ridge: A Civics Academy	Davenport
Compass Middle Charter	Bartow
Crystal Lake Middle	Lakeland
Cypress Junction Montessori	Winter Haven
Daniel Jenkins Academy of Technology	Haines City
Davenport School of the Arts	Davenport
Denison Middle	Winter Haven
Discovery Academy of Lake Alfred	Lake Alfred
Doris A Sanders Learning Center	Lakeland
Dundee Ridge Middle Academy	Dundee
Edward W. Bok Academy	Lake Wales
Edward W. Bok Academy, North	Lake Wales
Fort Meade Middle-Senior	Fort Meade
Frostproof Middle-Senior	Frostproof
Gause Academy of Leadership	Bartow
Jean O'Dell Learning Center	Bartow
Jere L. Stambaugh Middle	Auburndale
Jewett Middle Academy Magnet	Winter Haven
Jewett School of the Arts	Winter Haven
Karen M. Siegel Academy	Lake Alfred
Kathleen Middle	Lakeland
Lake Alfred Polytech Academy	Lake Alfred
Lake Gibson Middle	Lakeland
Lake Marion Creek Middle	Poinciana
Lakeland Highlands Middle	Lakeland
Lakeland Montessori Middle	Lakeland
Language & Literacy Academy	Winter Haven
Lawton Chiles Middle Academy	Lakeland
McKeel Academy of Technology	Lakeland
McLaughlin Middle School & Fine Arts Academy	Lake Wales
Mulberry Middle	Mulberry

TABLE IV-11
MIDDLE SCHOOLS WITHIN THE POLK COUNTY SCHOOL DISTRICT

Middle School	Location
New Beginnings High	Winter Haven
REAL Academy	Lakeland
Rochelle School of the Arts	Lakeland
Roosevelt Academy	Lake Wales
Rosabelle W. Blake Academy	Lakeland
Shelley S. Boone Middle	Haines City
Sleepy Hill Middle	Lakeland
Southwest Middle	Lakeland
Union Academy	Bartow
Westwood Middle	Winter Haven

Source: Polk County Public Schools; https://polkschoolsfl.com/schoollistings/

TABLE IV-12
HIGH SCHOOLS WITHIN THE POLK COUNTY SCHOOL DISTRICT

High School	Location
Auburndale Senior High	Auburndale
Bartow Senior High	Bartow
Chain of Lakes Collegiate High	Winter Haven
Discovery High School	Lake Alfred
Doris A Sanders Learning Center	Lakeland
Fort Meade Middle-Senior	Fort Meade
Fresh Start Community Campus	Bartow, Lakeland, & Winter Haven
Frostproof Middle-Senior	Frostproof
Gause Academy of Leadership	Bartow
George W. Jenkins Senior High	Lakeland
Haines City HS-IB	Haines City
Haines City Senior High	Haines City
Harrison School for the Arts	Lakeland
International Baccalaureate	Bartow
Jean O'Dell Learning Center	Bartow
Karen M. Siegel Academy	Lake Alfred
Kathleen Senior High	Lakeland
Lake Gibson Senior High	Lakeland

TABLE IV-12
HIGH SCHOOLS WITHIN THE POLK COUNTY SCHOOL DISTRICT

High School	Location
Lake Region High	Eagle Lake
Lake Wales Senior High	Lake Wales
Lakeland Senior High	Lakeland
McKeel Academy of Technology	Lakeland
Mulberry Senior High	Mulberry
New Beginnings High	Winter Haven
Polk Pre-Collegiate Academy	Auburndale
Polk State College Collegiate High	Lakeland
Polk State Lakeland Gateway to College Charter High School	Lakeland
Polk Virtual	Lakeland
Ridge Community High	Davenport
Ridge Technical College	Winter Haven
Roosevelt Academy	Lake Wales
Summerlin Academy	Bartow
Tenoroc High	Lakeland
Traviss Technical College	Lakeland
Winter Haven Senior	Winter Haven

Source: Polk County Public Schools; https://polkschoolsfl.com/schoollistings/

Post-Secondary Education

Table IV-13 includes a list of institutions providing post-secondary education in Polk County.

TABLE IV-13
POST-SECONDARY EDUCATIONAL INSTITUTIONS IN POLK COUNTY

School	Location
Polk State College	Bartow, Lake Wales, Lakeland, & Winter Haven
Florida Southern College	Lakeland
Southeastern University	Lakeland
Florida Polytechnic University	Lakeland
Warner University	Lake Wales
Webber International University	Babson Park
Keiser University	Lakeland

TABLE IV-13
POST-SECONDARY EDUCATIONAL INSTITUTIONS IN POLK COUNTY

School	Location
Florida Technical College	Lakeland
Ridge Technical Center	Lakeland
Southern Technical College	Auburndale
Traviss Technical Center	Lakeland

Source: Polk County Public Schools; https://polkschoolsfl.com/schoollistings/

SECTION V – HAZARD IDENTIFICATION AND ANALYSIS

44 Code of Federal Regulations	
44 CFR §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.

Overview

The Hazard Identification and Analysis section of the Polk County 2020 Multi-Jurisdictional Local Mitigation Strategy (LMS) identifies and assesses the risk Polk County and the jurisdictions have to a variety of hazards. The analysis consists of two components: Hazard Identification and Hazard Profiles. Hazard Identification is the review of a wide range of hazards, and the identification of hazards that may impact the County. The analysis includes a description of hazards presenting very low or low risk to the County and the rationale indicating why the LMS does not need any further analyses. Hazard Profiles identify how hazards impact the County and jurisdictions. The Hazard Vulnerability and Risk Assessment section (Section VI) provides detailed analyses indicating the type and amount of damages that may occur in the County and jurisdictions resulting from the identified hazards. Together, these sections identify, analyze, and assess the overall risk to Polk County and jurisdictions.

Hazard Identification

Polk County and jurisdictions are vulnerable to natural and human-caused hazards threatening life, property, and the economy. Upon consideration of the hazards recommended for review by the Federal Emergency Management Agency (FEMA) planning guidance, the LMS Working Group examined: research of past disaster declarations in the County; previous hazard mitigation plans in the County; the 2018 Florida Enhanced State Hazard Mitigation Plan (SHMP); other hazard related documents in the County; and input from the LMS Working Group. The LMS Working Group identified and omitted from the Hazards Profile the hazards having ~~a~~ very low and low probability of impacting Polk County and jurisdictions. Table V-1 identifies hazards the LMS analyzes further and those that the LMS omits.

Hazard Profile

Hazard profiles include a description of each hazard, its potential impacts, historical occurrences, and the probability of future occurrences. Historical occurrence information includes Spatial Hazard Events and Losses Database (SHELDUS) data, noteworthy events details, and a listing of events that occurred between 2009 and 2018.

Hazard Identification

Tables V-1 and V-2 list the hazards initially identified for consideration. Table V-1 includes 24 individual hazards categorized by type: atmospheric; geologic; hydrologic; other natural hazards; and human-caused hazards. Some hazards are interrelated or cascading (i.e., hurricanes can cause flooding and tornadoes); however, for preliminary hazard identification purposes, the LMS considers these hazards separately. Hazards~~,~~ such as drought or winter storms may impact a large area yet cause minor damage, while other hazards, such as tornadoes, may impact a small area but cause extensive damage. Table V-2 includes a

description of the hazards determined to require no further analyses (omitted from the LMS) and the rationale supporting the determination.

TABLE V-1:
INITIALLY IDENTIFIED HAZARDS AND DETERMINATION OF FURTHER ANALYSIS

Hazard	Further Analysis Required (Included in LMS)	No Further Analysis Required (Omitted from LMS)
ATMOSPHERIC HAZARDS		
Extreme Temperatures	X	
Fog	X	
Hurricanes /Tropical Storms	X	
Severe Storm and Tornado (Hail, Lightning, and Thunderstorm)	X	
Winter Storm		X
GEOLOGIC HAZARDS		
Earthquake		X
Landslide		X
Subsidence and Sinkhole	X	
Tsunami		X
HYDROLOGIC HAZARDS		
Coastal and Riverine Erosion		X
Drought	X	
Flood	X	
Storm Surge		X
OTHER NATURAL HAZARDS		
Climate Change	X	
Sea Level Rise		X
Wildfire	X	
HUMAN-CAUSED HAZARDS		
Civil Disturbance/Terrorism	X	
Cyber-Attacks	X	
Dam/Levee Failure	X	
Epidemics	X	
Hazardous Material Incidents	X	
Mass Immigration/Migration		X

SECTION V: HAZARD IDENTIFICATION AND ANALYSIS

TABLE V-1:
INITIALLY IDENTIFIED HAZARDS AND DETERMINATION OF FURTHER ANALYSIS

Hazard	Further Analysis Required (Included in LMS)	No Further Analysis Required (Omitted from LMS)
Nuclear/Radiological		X
Transportation Incident	X	

TABLE V-2:
IDENTIFIED HAZARDS THAT REQUIRE NO FURTHER ANALYSES (OMITTED FROM THE LMS)

WINTER STORM	
Description	Severe winter storms may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation. Ice storms occur when moisture falls and freezes immediately upon impact on trees, power lines, communication towers, structures, roads, and other hard surfaces. Winter storms can down trees, cause widespread power outages, damage property, and cause fatalities and injuries to human life. The LMS addresses extreme cold temperatures under Extreme Temperatures.
Rationale	Snowfall, ice storms, and sleet are very uncommon occurrences in Florida, especially as far south as Polk County. While winter storms may result in tornadoes, the LMS addresses those impacts under tornadoes. The LMS addresses extreme cold temperatures under Extreme Temperatures.
EARTHQUAKE	
Description	An earthquake is a sudden movement of the Earth's lithosphere (its crust and upper mantle). Such movements occur along faults, which are thin zones of crushed rock separating blocks of crust. When one block suddenly slips and moves relative to the other along a fault, the energy released creates vibrations called seismic waves that radiate up through the crust to the earth's surface, causing the ground to shake. Aftershocks usually follow earthquakes.
Rationale	The U.S. Geological Survey, National Seismic Mapping Project (website), locates Polk County in the 1% g (0.2 g) peak acceleration area. Because of this very low rating, the Florida Division of Emergency Management does not require local Comprehensive Emergency Management Plans to address earthquakes as a hazard that is likely to affect residents and visitors. The LMS does not include ~~a~~ further evaluation of this hazard related to vulnerability of people, property, critical infrastructure, environment, economy, or response operations.
LANDSLIDE	
Description	Landslides include a wide range of ground movement, such as rock falls, deep failure of slopes, and shallow debris flows. Although gravity acting on an over-steepened slope is the primary reason for a landslide, there are other contributing factors, such as: erosion by rivers, glaciers, or ocean waves creating over-steepened slopes; saturation by snowmelt or heavy rains causing weakened rock and soil slopes; earthquake created stresses causing weak slopes to fail; earthquakes of magnitude 4.0 and greater triggering landslides; volcanic eruptions producing loose ash deposits, heavy rain, and debris flows; and excess weight from accumulation of rain

TABLE V-2:	
	or snow, stockpiling of rock or ore, from waste piles, or from human-built structures that stress weak slopes to failure.
Rationale	Since there has been only one recorded landslide in Florida~~,~~ which occurred over 60 years ago~~,~~ on a very steep slope, and given the low-gradient topography in Polk County, the LMS does not include ~~a~~ further evaluation of this hazard related to vulnerability to people, property, critical infrastructure, environment, economy, or response operations.
TSUNAMI	
Description	A tsunami is a series of waves generated by an undersea disturbance such as an earthquake. The speed of a tsunami traveling away from its source can range from up to 500 miles per hour in deep water to approximately 20 to 30 miles per hour in shallower areas near coastlines. Tsunamis differ from regular ocean waves in that their currents travel from the water surface all the way down to the sea floor. Wave amplitudes in deep water are typically less than one meter; they are often barely detectable to the human eye. However, as they approach shore, they slow in shallower water, basically causing the waves from behind to effectively "pile up", and wave heights to increase dramatically. As opposed to typical waves that crash at the shoreline, tsunamis bring with them a continuously flowing 'wall of water' with the potential to cause devastation to the immediate shore of coastal areas.
Rationale	Since most tsunamis are associated with major earthquakes, the possibility of a tsunami affecting the Atlantic or Gulf Coasts of Florida is remote. While the Caribbean region has a history of both earthquakes and tsunamis, they do not appear to have affected Florida's coastlines. Due to Polk County's inland location, the LMS does not include a further evaluation of this hazard related to vulnerability to people, property, critical infrastructure, environment, economy, or response operations.
COASTAL AND RIVERINE EROSION	
Description	Coastal erosion is a landward displacement of a shoreline caused by the forces of waves and currents over time. It is generally associated with episodic events such as hurricanes and tropical storms, nor'easters, storm surge, and coastal flooding, human activities that alter sediment transport may also cause coastal erosion. Construction of shoreline protection structures can mitigate the hazard, but may also exacerbate it under some circumstances. In rivers, the scouring action of moving water may cause bank erosion, particularly in times of flood.
Rationale	Polk County is an inland County with no coastline. Therefore, the County is not directly susceptible to coastal erosion hazards. Polk County contains 554 freshwater lakes, occupying approximately 135 square miles. The Hillsborough, Kissimmee, Palatlakaha, Peace, Alafia, and Withlacoochee rivers also wind their way throughout the County. The LMS omits erosion since it is not a hazard.
STORM SURGE	
Description	A storm surge is a large dome of water, often 50 to 100 miles wide, rising anywhere from four to five feet in a Category 1 hurricane, up to more than 30 feet in a Category 5 storm. Storm surge heights and associated waves are dependent upon the shape of the offshore continental shelf (narrow or wide) and the depth of the ocean bottom

TABLE V-2: IDENTIFIED HAZARDS THAT REQUIRE NO FURTHER ANALYSES (OMITTED FROM THE LMS)	
	(bathymetry). A narrow shelf, or one that drops steeply from the shoreline and subsequently produces deep water close to the shoreline, tends to produce a lower surge, but higher and more powerful storm waves. Storm surge arrives ahead of a storm's actual landfall and the more intense the hurricane, the sooner the surge arrives. Storm surge can be devastating to coastal regions, causing severe beach erosion and property damage along the immediate coast. Further, water rise caused by storm surge can be very rapid, posing a serious threat to those who have not yet evacuated flood-prone areas.
Rationale	Polk County is an inland County with no coastline. The geographical location of Polk County protects residents from storm surges associated with hurricanes. The LMS omits erosion since it is not a hazard.
SEA LEVEL RISE	
Description	Sea level, also called mean sea level, is the sea surface level midway between mean high and low levels, computed from the records of tidal oscillations over a long period. Relative sea level trends reflect changes in local sea level over time and are typically the most critical sea level trend for many coastal applications, including coastal mapping, marine boundary delineation, coastal zone management, coastal engineering, sustainable habitat restoration design, and public enjoyment of a beach.
Rationale	Polk County is an inland county with no coastline. Based on topography, a 5-meter rise in sea level would leave Polk County as an inland county while a 50-meter sea level rise would put all of Polk County except the Lake Wales Ridge and the other high points of the County under water. Predictions in the planning horizon do not indicate further evaluation. The LMS omits erosion since it is not a hazard.
MASS IMMIGRATION/MIGRATION	
Description	Mass immigration/migration refers to the migration of large groups of people from one geographical area to another. Mass migration differs from individual or small-scale migration, and from seasonal migration, which may occur on a regular basis.
Rationale	Most of Florida's mass immigration/migration events result from its proximity to the Caribbean Basin. Polk County will most likely not serve as either a debarkation destination for foreign nationals following a Haiti-like earthquake evacuation or as an immigration point of entry because the County does not have a major airport that serves international flights or a port to receive international shipping. The LMS omits erosion since it is not a hazard.
NUCLEAR/RADIOLOGICAL	
Description	A nuclear/radiological incident is a release of radioactive or nuclear material. It may result from a deliberate act, an accident, or general mismanagement, and may center around different materials or industrial practices
Rationale	Polk County is outside the 50-mile Emergency Planning Zone (EPZ) for all nuclear facilities is the State. An evaluation of critical facilities and activities within the County indicates that it is unlikely that nuclear or radiological devices would be employed locally. The LMS omits erosion since it is not a hazard.

Hazard Profile – Atmospheric

Atmospheric Hazards are natural hazards where processes operating in the atmosphere are mainly responsible.

Extreme Temperatures

Description and Background

The extreme temperature hazard includes extreme heat and extreme cold. Both occur at a regional geographic level, uniformly exposing the entire County to their impacts.

Extreme Heat: Extreme heat includes temperatures that hover 10 degrees or more above the normal summer high temperature and last for several weeks. The normal summer high temperature in Polk County is 95 degrees. The heat index may reach up to 115 degrees. Humid or muggy conditions, which add to the discomfort of high temperatures, occur when a "dome" of high atmospheric pressure traps hazy, damp air near the ground where the temperature and relative humidity combine for a dangerous heat index. 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 dangerous. Extreme heat can occur throughout the State but typically occurs in the summer between the months of June and September. As illustrated in Figure V.1, Polk County has a high summer heat index. Extreme heat impacts humans and agriculture.

Heat Wave: A heat wave is primarily a public health concern. In 1979, meteorologist R.G. Steadman, developed the Heat Index shown in Table V-3 to illustrate the risks associated with extreme summer heat. The listed heat disorders describe the general effect on people in high-risk groups. The Heat Index, also called apparent temperature, is a measure of how hot it really feels upon combining relative humidity and the actual air temperature.

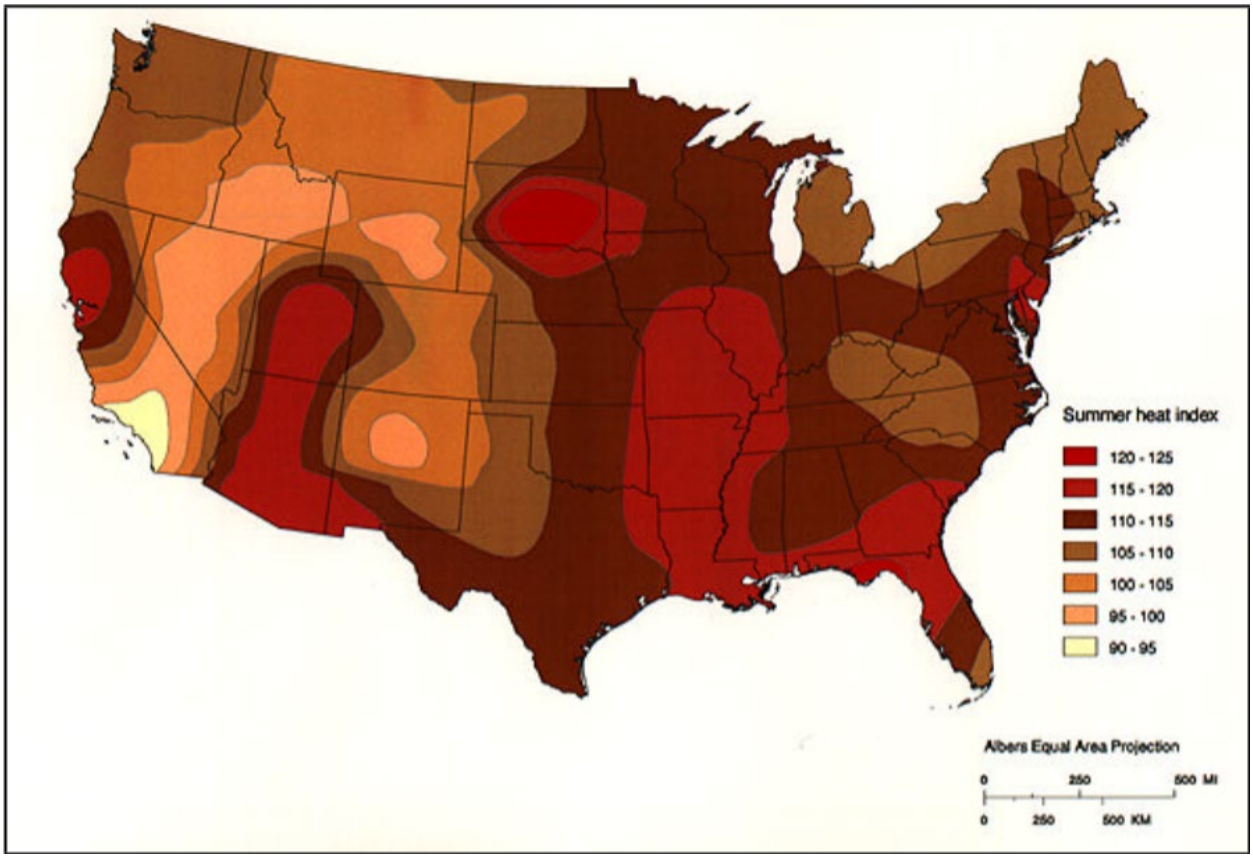


Figure V.1: Severity and areal extent of extreme summer heat; Source: FEMA.gov

TABLE V-3:
HEAT DANGER CATEGORIES (HEAT INDEX)

Danger Category	Heat Disorders	Apparent Temperature (˚F)
I. Caution	Fatigue possible with prolonged exposure and/or physical activity	80-90
II. Extreme Caution	Sunstroke, heat cramps, or heat exhaustion possible with prolonged exposure and/or physical activities	90-105
III. Danger	Sunstroke, heat cramps, or heat exhaustion likely; heat stroke possible with prolonged exposure and/or physical activity	105-130
IV. Extreme Danger	Heatstroke or sunstroke highly likely with continued exposure	>130

Source: NOAA; http://www.srh.noaa.gov/oun/?n=safety-summer-heatindex

Extreme Cold: Extreme Cold includes temperatures at or below freezing for an extended period. Extreme Cold can be a prolonged period of excessively cold weather, and/or a sudden invasion of very cold air over a large area. Along with frost, this hazard can cause damage to agriculture, infrastructure, and property.

Freeze: According to the National Oceanic and Atmospheric Administration's (NOAA's) National Weather Service, a freeze occurs when surface air temperatures are at or below 32 degrees Fahrenheit over a widespread area for a climatologically significant period. Freeze warnings are issued during the growing season when meteorologists anticipate surface temperatures will drop below freezing over a large area for an extended period, regardless of whether frost develops. Exposure to temperatures below freezing for extended periods of time may damage or kill crops. Freezes may also cause damage to infrastructure.

Frost, often associated with freezes, is a layer of ice crystals produced by the deposit of water from the air onto a surface that is at or below freezing. A freeze warning is issued to inform public and agricultural interests of anticipated freezing conditions over a large area. Similarly, a hard freeze warning is issued under the same conditions as a freeze warning, but the temperatures is at or below 28˚ F for a duration of four hours or more. Certain agricultural crops in Polk County are vulnerable to freeze and hard freeze events.

Historical Occurrences

Since 1950, Florida has had at least 12 recorded severe freezes with the most recent occurring December 24 and December 25, 1989. A Presidential Disaster Declaration was issued, and statewide crop losses exceeded $18 million. Damage in Polk County exceeded $1 million. The freeze affected more than two million acres of agriculture and citrus products (Florida State Agricultural Stabilization and Conservation Service, 1990). Severe freezes in 1982, 1983, and 1985 destroyed crops and citrus trees in Polk and other Central Florida counties. Many citrus growers opted not to re-plant the citrus, and instead ~~to~~ converted the groves to other uses.

According to SHELDUS, 17 extreme temperature events occurred from 2009 through 2019 in one fatality, $24 million in crop damage, and $1.1 million in property damage. Table V-4 includes extreme cold/frost/freeze and heat incidents from 2009 – 2018 as reported by NOAA's National Centers for Environmental Information (NCEI).

TABLE V-4:
COLD/FROST/FREEZE AND HEAT INCIDENTS (2009-2018)

Date	Type	Location	Death	Injuries	Property Damage ($)	Crop Damage ($)
01/21/2009	Frost/freeze	Polk	0	0	0	0
01/22/2009	Frost/freeze	Polk	0	0	0	0
01/23/2009	Frost/freeze	Polk	0	0	0	0
02/05/2009	Frost/freeze	Polk	0	0	0	0

TABLE V-4:
COLD/FROST/FREEZE AND HEAT INCIDENTS (2009-2018)

Date	Type	Location	Death	Injuries	Property Damage ($)	Crop Damage ($)
02/06/2009	Frost/freeze	Polk	0	0	0	0
10/08/2009	Heat	Polk	1	0	0	0
01/10/2010	Frost/freeze	Polk	0	0	0	13,670,000
02/26/2010	Frost/freeze	Polk	0	0	0	1,820,000
12/15/2010	Frost/freeze	Polk	0	0	0	8,490,000
01/04/2012	Frost/freeze	Polk	0	0	0	0
01/05/2012	Frost/freeze	Polk	0	0	0	0
01/15/2012	Frost/freeze	Polk	0	0	0	0
02/12/2012	Frost/freeze	Polk	0	0	0	0
02/13/2012	Frost/freeze	Polk	0	0	0	0
12/23/2012	Frost/freeze	Polk	0	0	0	0
02/18/2013	Frost/freeze	Polk	0	0	0	0
01/18/2018	Frost/Freese	Polk	0	0	0	0

Source: National Oceanic and Atmospheric Association; www.ncdc.noaa.gov

Potential Impacts

As an inland county, Polk County is more vulnerable to temperature extremes since it is located further away from the moderating influences of the ocean or an estuary. During extended periods of high temperatures, or high temperatures with high humidity, individuals can suffer heat stroke, heat exhaustion, heat syncope, and heat cramps. Extreme heat can ultimately cause death. Most heat disorders occur because the individual has been overexposed to heat or has over-exercised for his or her age and physical condition. Older adults, young children, and the sick or overweight are more likely to succumb to extreme heat. During extended periods of low temperatures, individuals can suffer hypothermia and frostbite. Those at highest risk are primarily engaged in outdoor activities or are the elderly who are chronically exposed to colder indoor temperatures. Populations vulnerable to temperature extremes include the elderly, the very young, the homeless, and low-income individuals.

Temperatures remaining below the freezing point for four hours or more may severely affect agriculture production. Extreme temperatures may result in total crop loss or destruction of the plants or trees. Freezes are a significant recurring threat to the agriculture industry. On average, the State can expect a mild freeze every one to two years with hard freezes occurring less often. The number of nights with frost and/or freezing temperatures can vary from 23 to as many as 66 during the winter growing season.

Extreme temperatures can impact power usage and generation; however, this rarely results in structural losses. The demand for water increases during periods of hot weather. In extreme heat waves, people use water to cool bridges and other metal structures susceptible to heat failure. This can result in reduced water supply and water pressure and impact fire suppression in urban and rural areas. The rise in water temperature during heat waves contributes to the degradation of water quality, and negatively impacts fish populations. It can also lead to the death of other organisms in the aquatic ecosystems. Scientists

have linked high temperatures to rampant algae growth, causing fish kills in rivers and lakes. Potential losses to agriculture depend on when in the growing season the impact occurred.

Probability of Future Occurrences

Historically, the County has experienced events of extreme temperatures annually. Generally, no damages have been associated with these events. Sustained episodes of high heat can result in illness and fatalities in susceptible populations. As the County's population of elderly persons increases, impacts from this potential hazard will increase. There are no recorded occurrences of extreme summer heat impacting Polk County in which jurisdictions taken response actions beyond public service announcements. Polk County averages three to four freezes annually with cold fronts occurring approximately every 10 to 14 days throughout the winter. The frequency of extreme heat events is likely to occur every two to seven years based on the naturally occurring El Niño/La Niña cycle. In Florida, La Niña years include reduced rainfall and higher temperatures. The probability of future extreme temperatures is medium.

Fog

Description and Background

Fog consists of dense clouds of tiny water droplets suspended in the air above land or water surfaces. Radiation fog occurs because of heat loss by radiative cooling of moist air. Advection fog occurs where warm, moist air moves over a cold surface, or cold air moves over a body of warm water. Fog is generally a danger where visual sensing and signals are essential to safe activity or operations (Hewitt, Kenneth). Thick masses of fog are often dense and can rapidly drop visibility levels. Unlike tornadoes or floods, fog itself does harm only indirectly, by paralyzing, seriously reducing, or slowing down the movement of persons and goods (Hewitt, Kenneth). Fog incidents can occur throughout the entire County.

Figure V.2: Fog on US 98 near Bartow
Source: CFRPC

Historical Occurrences

The most significant recent fog event in Polk County occurred on January 9, 2008, when a mixture of fog and smoke from a prescribed burn covered portions of Interstate 4 causing 70 vehicles to collide near mile marker 47, resulting in 5 deaths and 38 injuries.

According to SHELDUS, three severe fog events occurred from 1960 through 2012 not including the January 9, 2008 event. The events resulted in two fatalities and $1,057,660 (2018 adjusted dollars) in

property damages as reported by the Database. NCEI and SHELDUS reported no fog events in the County from 2009 through 2019.

Potential Impacts

Foggy conditions may cause accidents due to low visibility and the impairment of a driver's perceptual judgments of speed and distance. Foggy conditions can lead to chain-reaction accidents, which can cause property damage and loss of life. As illustrated in Figure V.3, the Interstate 4 corridor running through Polk County has a high volume of fog related crashes. There are a variety of road sections, intersections, and rail crossings in the County that are more susceptible to impacts of foggy conditions (See Section VI).

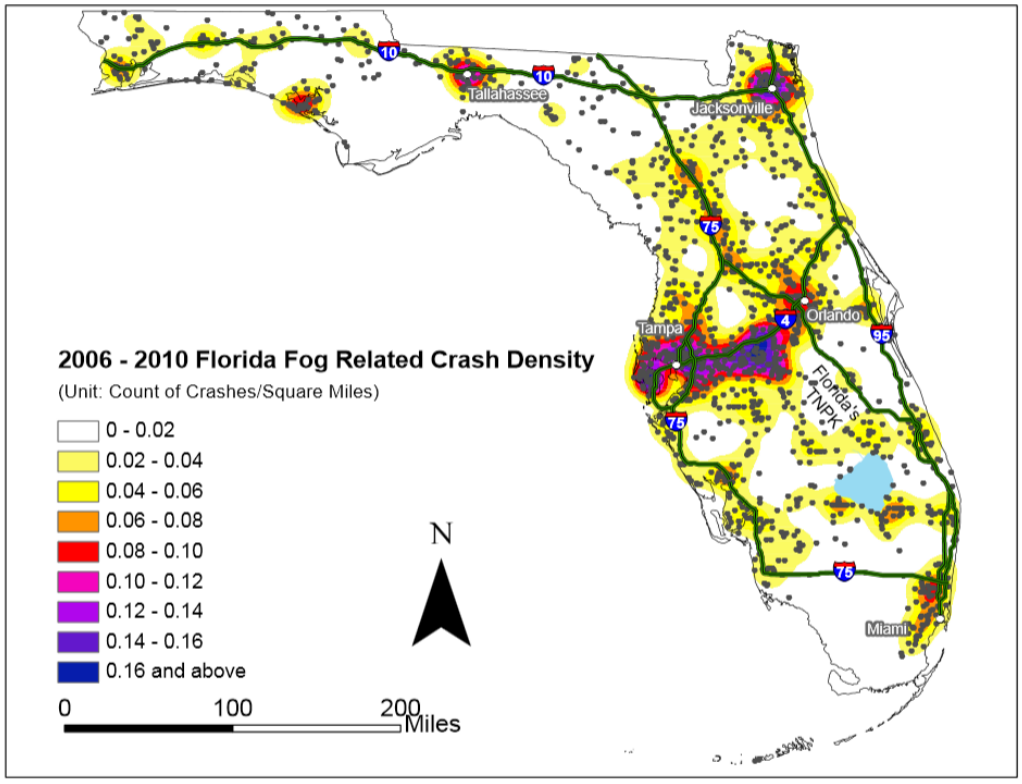


Figure V.3: 2006-2010 Florida fog related crash density Source: FDOT

Probability of Future Occurrences

According to Geography Hunter and Florida Department of Transportation (FDOT), Central Florida and Polk County can expect to experience 15 to 20 days per year with heavy fog, with events more likely to occur in cold months. This projection is based on historical crash-related density and the number of heavy fog event days. The probability of future significant fog impacts is medium.

Hurricanes and Tropical Storms

Description and Background

Hurricanes and tropical storms (cyclones) are closed circulation systems developing around a low-pressure center in which the winds rotate counter-clockwise in the Northern Hemisphere (or clockwise in

the Southern Hemisphere) and whose diameter averages 10 to 30 miles across. A tropical cyclone refers to any such circulation that develops over tropical waters. Tropical cyclones act as a "safety-valve," limiting the continued build-up of heat and energy in tropical regions by maintaining the atmospheric heat and moisture balance between the tropics and the pole-ward latitudes. The primary damaging forces associated with hurricanes and tropical storms are high-level sustained winds, heavy precipitation, and tornadoes. Coastal areas are vulnerable to the additional forces of storm surge, wind-driven waves, and tidal flooding, which can be more destructive than cyclone wind.

The energy source for a tropical cyclone is the release of latent heat from the condensation of warm water. Tropical cyclone formation requires: a low-pressure disturbance; warm sea surface temperature; rotational force from the spinning of the earth; and the absence of wind shear in the lowest 50,000 feet of the atmosphere. Most hurricanes and tropical storms form in the Atlantic Ocean, Caribbean Sea, and Gulf of Mexico during the official Atlantic hurricane season, which encompasses the months of June through November. The Atlantic hurricane season peaks in early to mid-September, and the average number of storms that reach hurricane intensity per year is approximately six.

Figure V.4: Hurricane Charley damage at Quails Bluff Apartments in Lake Wales; Source: The Tampa Tribune, 2004

As a hurricane develops, barometric pressure (measured in millibars or inches) at its center falls and winds increase. If the atmospheric and oceanic conditions are favorable, a tropical depression may form. When maximum sustained winds reach or exceed 39 miles per hour, the system becomes a named tropical storm, and the National Hurricane Center in Miami, Florida closely monitors it. When sustained winds reach or exceed 74 miles per hour the storm is classified as a hurricane. The Saffir-Simpson Scale further classifies Hurricane intensity on a scale of 1 to 5, with 5 being the most intense. The Saffir-Simpson Scale categorizes hurricane intensity linearly based upon maximum sustained winds, barometric pressure, and storm surge potential, which estimate potential damage. Categories 3, 4, and 5 are "major" hurricanes. Hurricanes within this range comprise 20 percent of total tropical cyclone landfalls, but they account for over 70 percent of the damage in the United States.

Hurricanes and tropical storms threaten the Atlantic and Gulf coasts of the United States. Landfalling storms directly impact coastal regions, but may also impact areas hundreds of miles inland. All areas of Polk County are susceptible to the accompanying hazard effects of extreme wind, flooding, and tornadoes.

Historical Occurrences

The most prominent hurricanes and tropical storms occurred in 2004 when three hurricanes (Charley, Frances, and Jeanne) directly impacted and one hurricane (Ivan) indirectly impacted Polk County:

- Hurricane Charley on August 13, 2004;
- Hurricane Frances on September 4, 2004;
- Hurricane Ivan on September 16, 2004; and
- Hurricane Jeanne on September 26, 2004.

Outside of the 2004 season, Hurricanes Erin (1995), Irene (1999), Wilma (2005), and Ernesto (2006), along with Tropical Storms Jerry (1995), Mitch (1998), Fay (2008), and Irma (2017) impacted the County within the last 25 years (Source: Polk County Emergency Operations Center, NOAA). FEMA declarations for Polk County hurricanes and tropical storms since 2000 include:

August 13, 2004	Hurricane Charley (FEMA declaration #1539-DR)
September 5, 2004	Hurricane Frances (FEMA declaration #1545-DR)
September 16, 2004	Hurricane Ivan The remnants of this hurricane impacted Polk County.
September 26, 2004	Hurricane Jeanne (FEMA declaration #1561-DR)
2005	Hurricane Wilma The County was impacted by this hurricane. The County received a declaration of Public Assistance (FEMA declaration #1609-DR).
2008	Tropical Storm Fay The County was impacted by Tropical Storm Fay. The County received a declaration of Individual Assistance (FEMA declaration #1785-DR).
2017	Hurricane Irma Polk County Emergency Management reported Irma caused: the destruction of 96 homes or businesses; major damage to 1,604 homes and businesses; and minor damage to 7,710 homes and businesses. Estimates of total property damage were $69 million in public assistance claims, including debris removal and emergency protective measures, most of which came from wind damage. Damage to citrus crops is approximately $93.5 million. One tornado touched down near Old Polk City Road near Lakeland, causing EF2 damage (FEMA declaration #4337-DR).

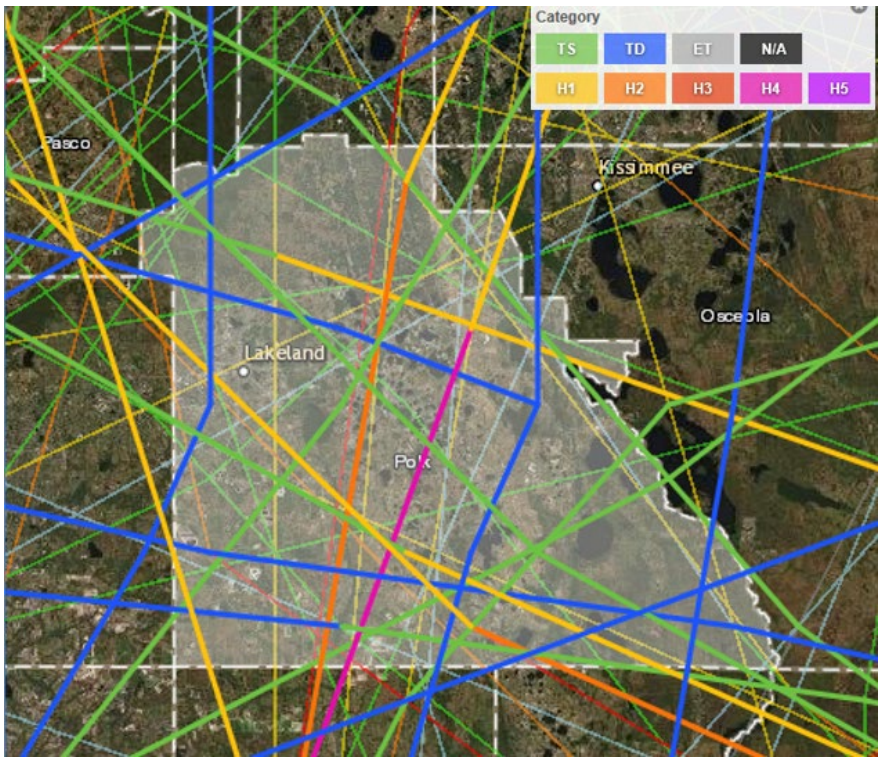


Figure V.5: Hurricane tracks over Polk County; Source: NOAA http://coast.noaa.gov/hurricanes

According to SHELDUS, 24 hurricane/tropical storm events occurred from 1960 through 2019, resulting in 53 injuries, 1 fatality, approximately $75.6 in crop damage, and approximately $401 million in property damage. Table V-5 includes hurricane and tropical storm events between 2009 to 2019, as indicated by NOAA.

TABLE V-5:
HURRICANE/TROPICAL STORM INCIDENTS BY JURISDICTION (2009-2019)

Date	Hurricane/Tropical Storm	Location	Deaths	Injuries	Property Damage ($)	Crop Damage ($)
9/09/2017	Hurricane Irma	Polk County	0	0	68,980,000	93,500,000

Source: National Oceanic and Atmospheric Association; www.ncdc.noaa.gov

Potential Impacts

Florida has been hit with the most hurricanes in recorded history. Hurricane Michael in 2018 brought the state's tally to 120 total hurricanes — nearly twice as many as Texas, which has sustained the second-highest number of hurricanes in recorded history, which began in 1851 with the establishment of the Saffir/Simpson category. The most hurricane activity, from June through July, and again in late October, is in the Gulf of Mexico and western Caribbean. Polk County experiences high winds and inland flooding generated from hurricane activity. Tornadoes associated with tropical storms are most frequent in September and October when the incidence of tropical storms is greatest. Inland flooding is likely during

any hurricane due to the low elevation of much of the County. Hurricane force winds can destroy tall structures, like cell towers; as mobile homes; and other vulnerable structures.

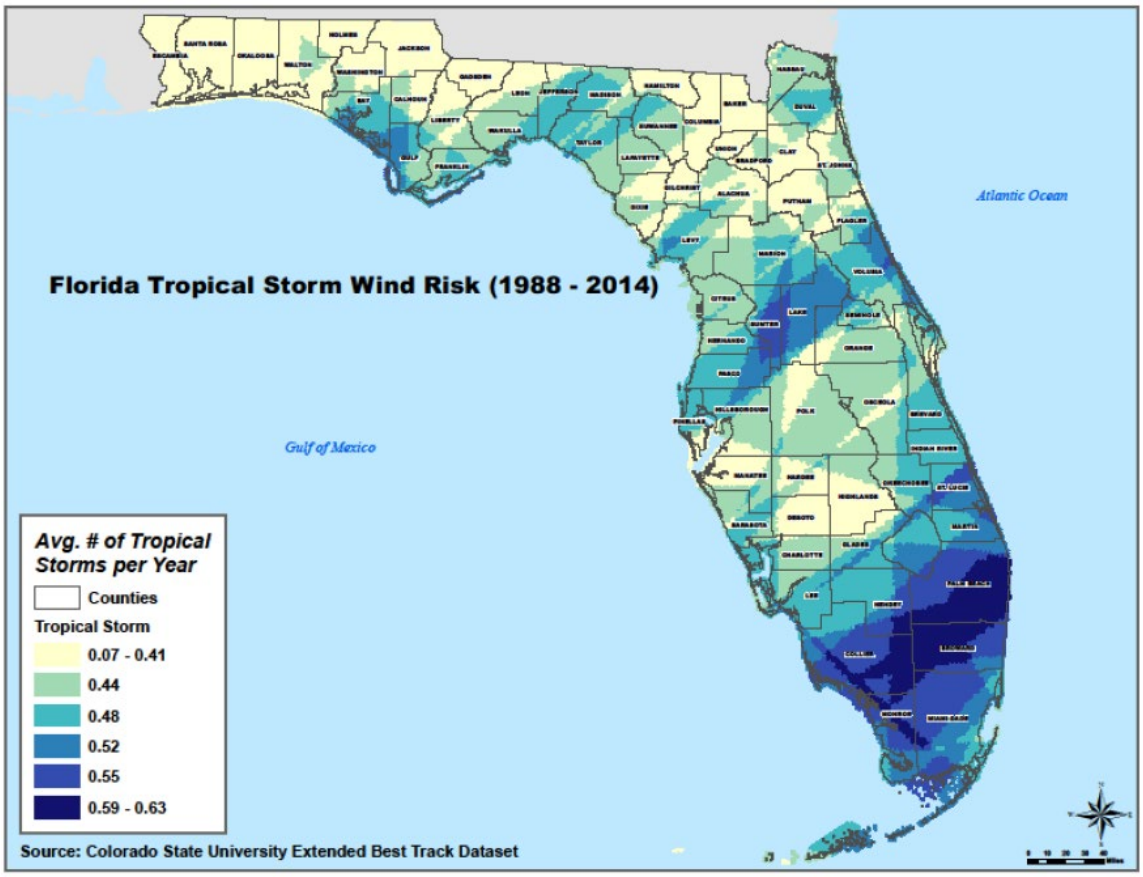


Figure V-6.: Florida tropical storm wind risk (1988-2014);
Source*: 2018 State Hazard Mitigation Plan*

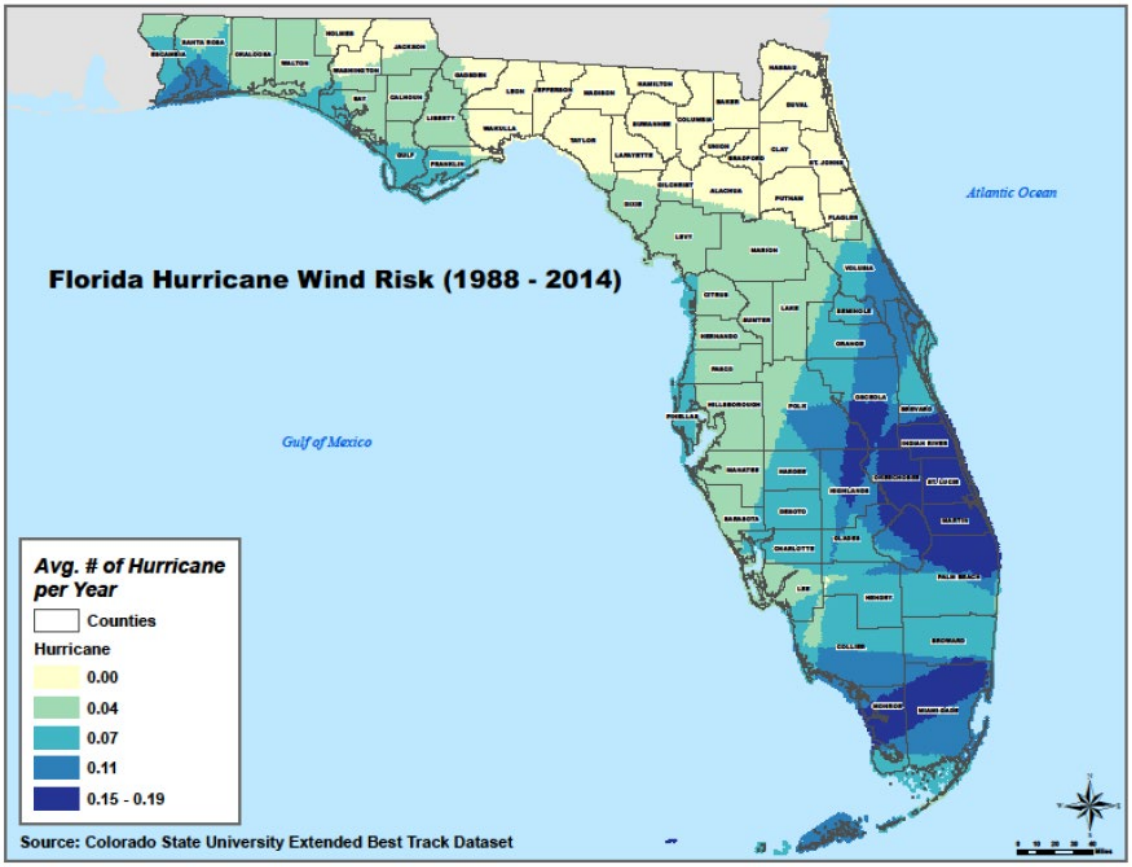


Figure V.7.: Florida tropical storm wind risk (1988-2014); Source*: 2018 State Hazard Mitigation Plan*

Probability of Future Occurrences

According to NOAA's website, there is a 50 percent probability of a named storm striking Central Florida. Recent history indicates that residents can expect a storm to impact Polk County every 2 to 3 years, and the most likely event will be a Category 3 or lesser storm. The probability of a storm effecting the County is low to medium.

The 2018 Florida Enhanced State Hazard Mitigation Plan includes the number of structures and structure values impacted by probabilistic hurricane winds over return periods of 10 years to 1,000 years. Table V-6 includes this information and Figures V-8 through V-14 include the maps illustrating the probability zones.

TABLE V-6:
PROBABILISTIC HURRICANE WIND WITH RETURN PERIOD AND AFFECTED STRUCTURES

Return Period	Number of Structures	Value of Structures
10-Year	1,005	$69,277,000
20-Year	9,108	$269,307,000
50-Year	35,277	$867,926,000
100-Year	69,347	$1,855,032,000
200-Year	107,209	$3,532,722,000
500-Year	150,846	$6,783,365,000
1,000-Year	174,141	$10,002,026,000

Source: 2018 Florida Enhanced State Hazard Mitigation Plan

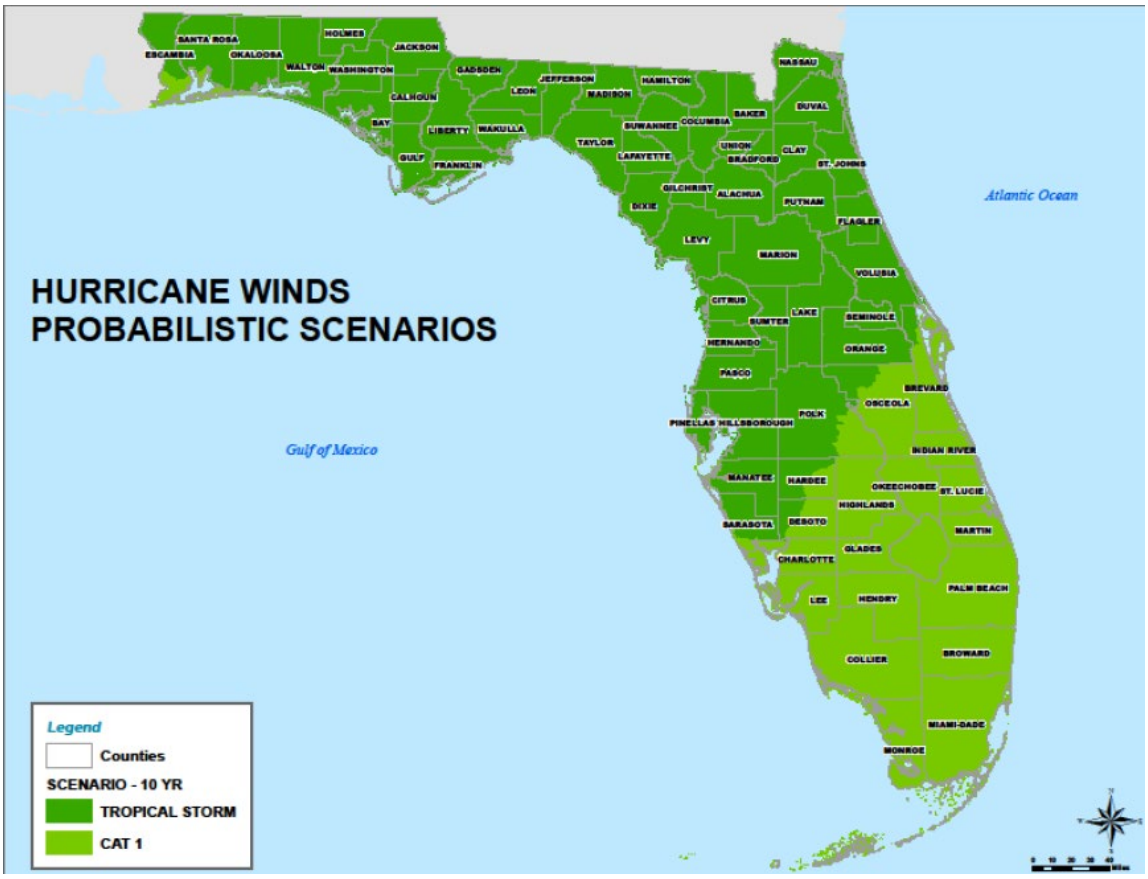


Figure V.8: Hurricane winds probabilistic scenario, 10-year return;
Source: 2018 State Hazard Mitigation Plan

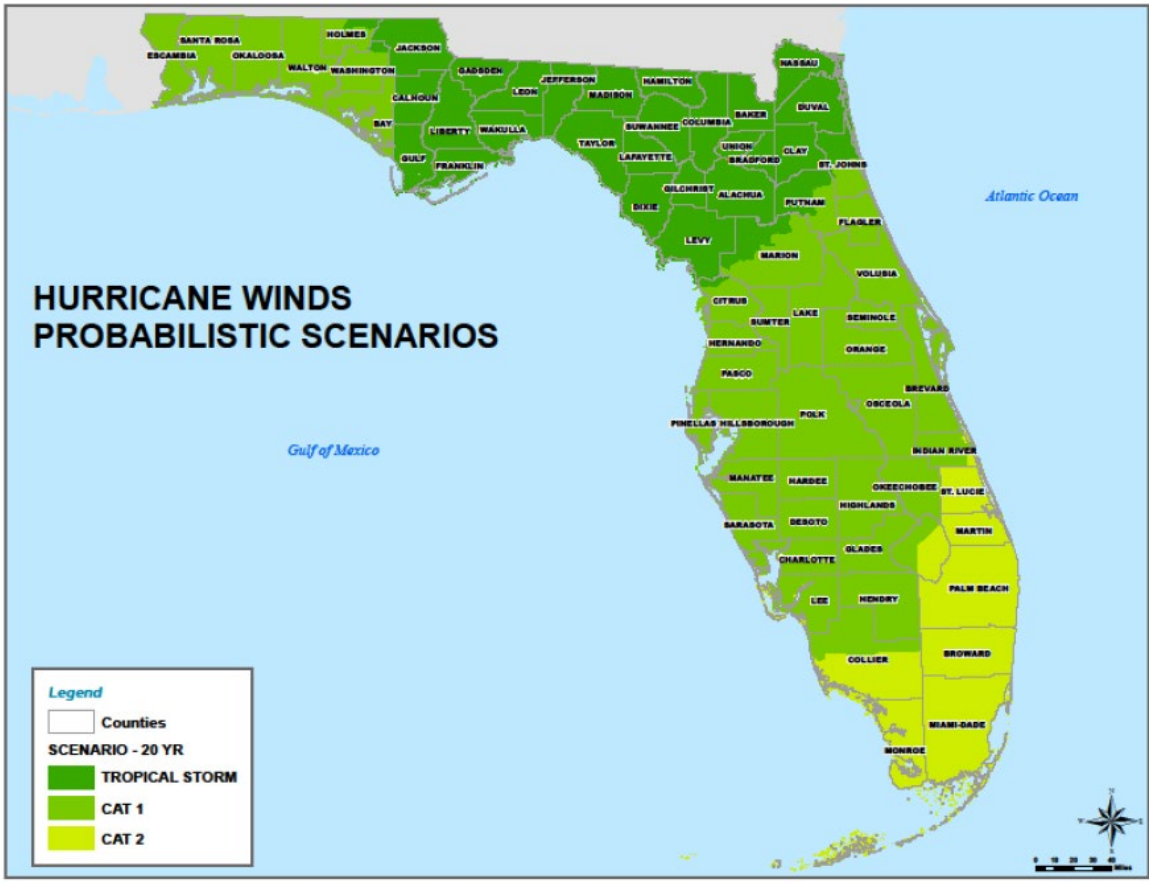


Figure V.9: Hurricane winds probabilistic scenario, 20-year return;
Source: 2018 State Hazard Mitigation Plan

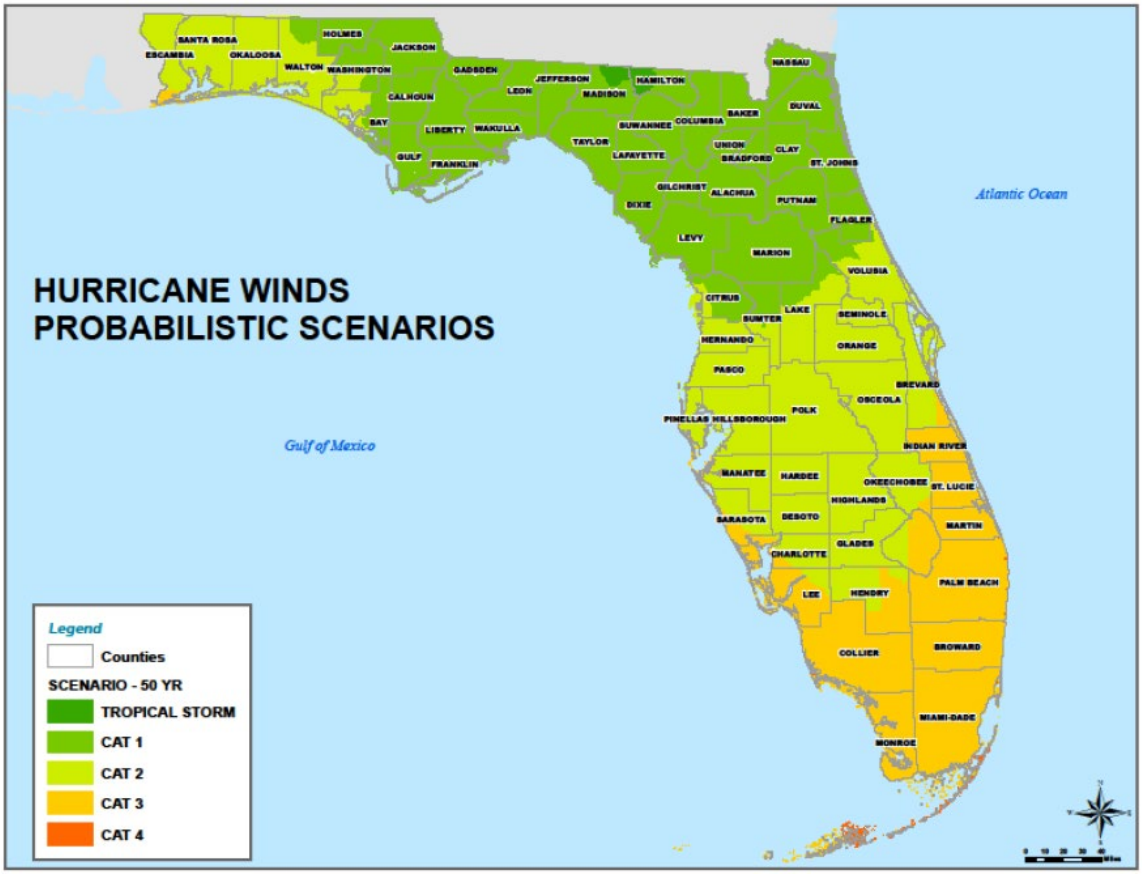


Figure V.10: Hurricane winds probabilistic scenario, 50-year return;
Source: 2018 State Hazard Mitigation Plan

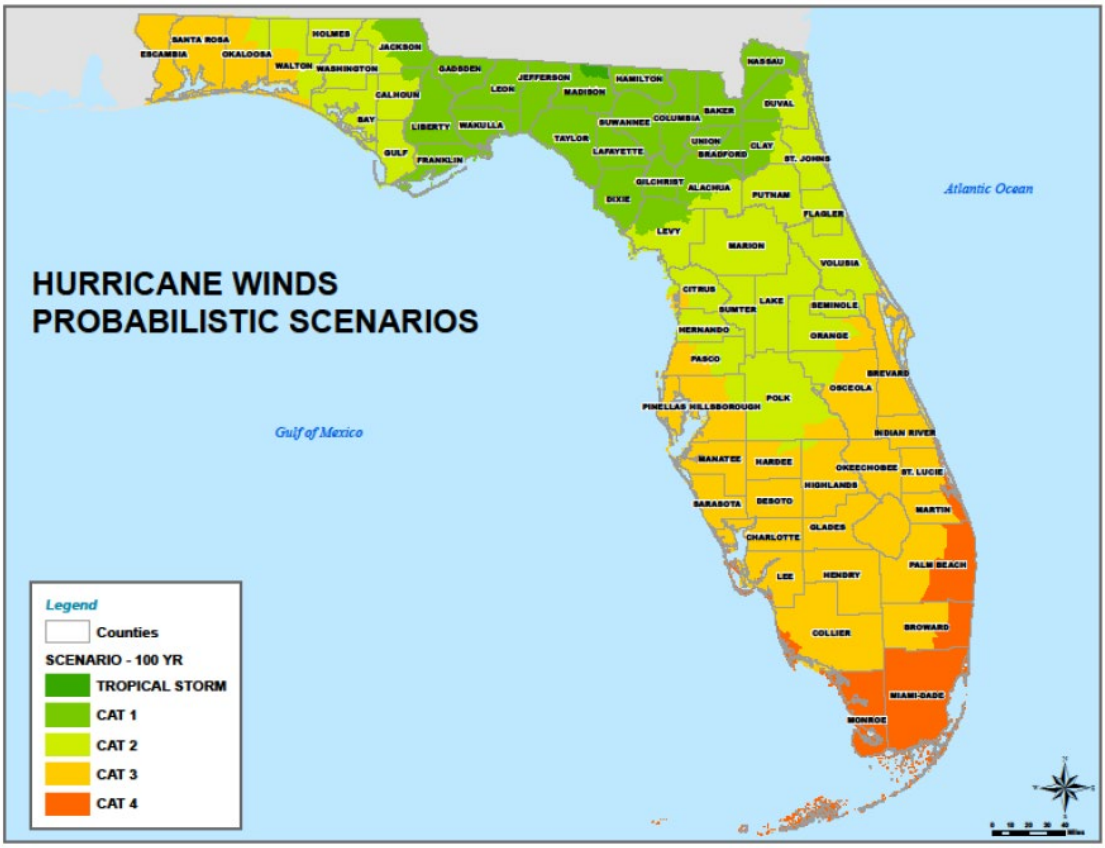


Figure V.11: Hurricane winds probabilistic scenario, 100-year return
Source: 2018 State Hazard Mitigation Plan

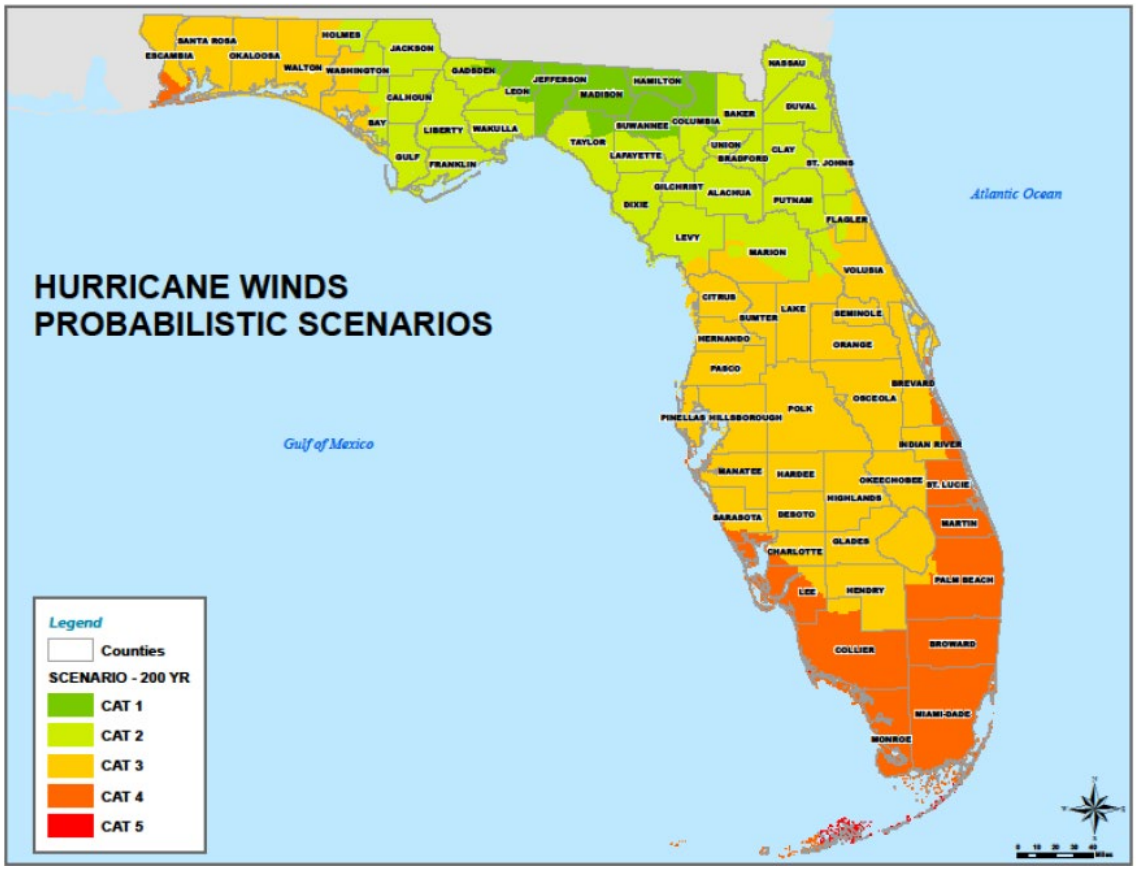


Figure V.12: Hurricane winds probabilistic scenario, 200-year return
Source: 2018 State Hazard Mitigation Plan

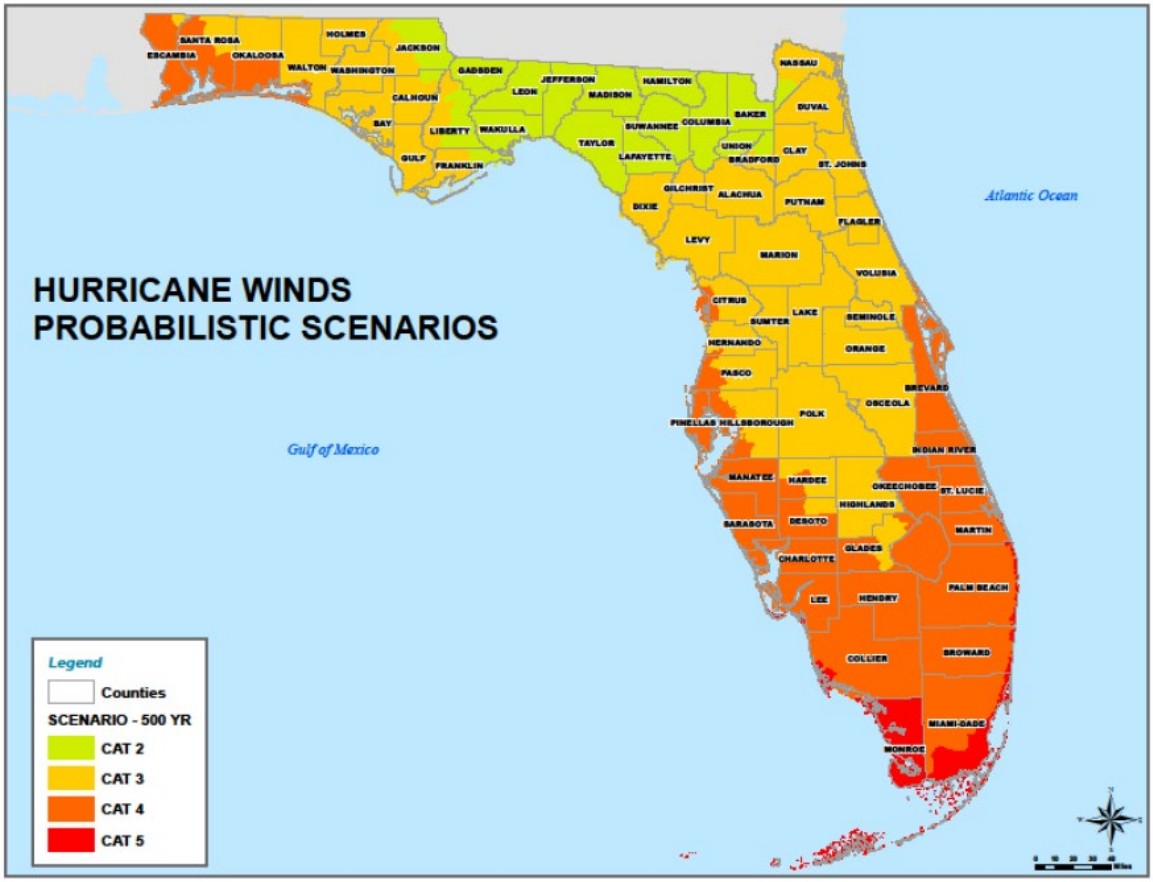


Figure V.13: Hurricane winds probabilistic scenario, 500-year return
Source: 2018 State Hazard Mitigation Plan

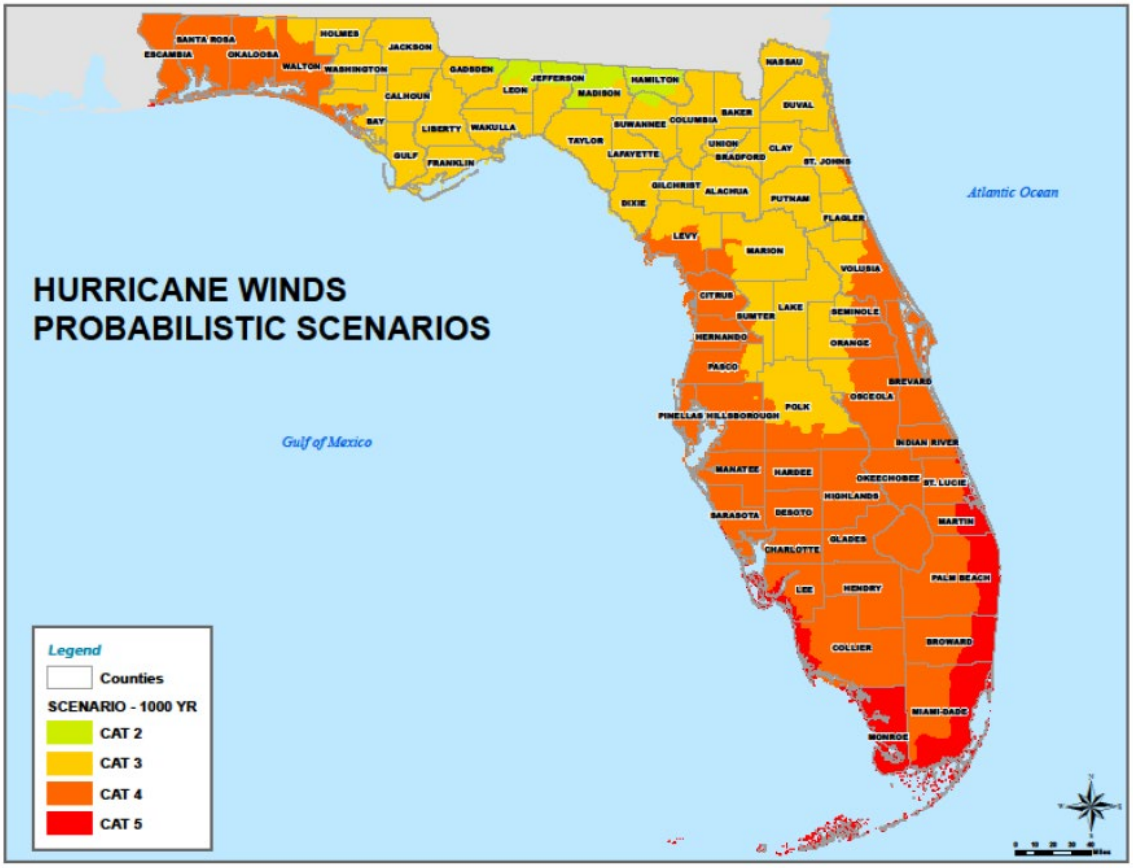


Figure V.14: Hurricane winds probabilistic scenario, 1,000-year return
Source: 2018 State Hazard Mitigation Plan

Severe Storms and Tornadoes (Hail, Lightning, and Thunderstorms)

Severe storms and tornadoes share components of hail, lightning, and thunderstorms. While they are all related, they can occur independently of each other. This section includes a discussion of each of the components.

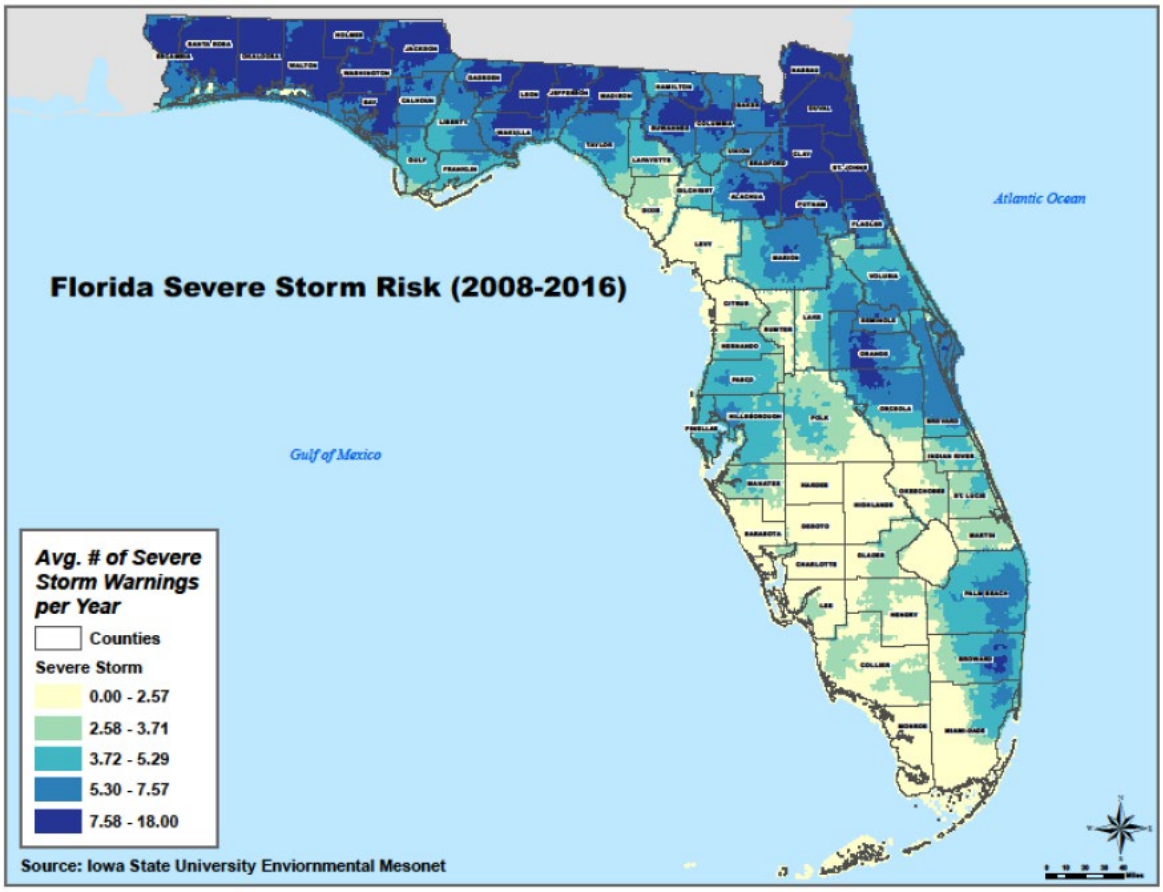


Figure V.15: Florida severe storm risk;
Source: 2018 Florida Enhanced State Hazard Mitigation Plan

Hail

Description and Background

Hail frequently accompanies thunderstorms and has the potential to cause substantial damage. Early in the developmental stages of hail, ice crystals form within a low-pressure front due to the rapid rising of warm air into the upper atmosphere and the subsequent cooling of the air mass. Frozen droplets gradually accumulate on the ice crystals until they develop sufficient weight to fall as precipitation. Hail precipitation falls in sphere or irregularly shaped masses greater than 0.75 inches in diameter. The size of hailstones is a direct function of the size and severity of the storm. High velocity updraft winds keep hail in suspension in thunderclouds. The strength of the updraft is a function of the intensity of heating at the Earth's surface. Higher temperature gradients relative to elevation above the surface result in increased suspension time and hailstone size. Hailstones grow when the storm repeatedly blows the frozen droplet into the higher elevations. The hailstone ascends if the updraft velocity is high enough to hold the hailstone. As soon as the size and weight of the hailstone overcome the lifting capacity of updraft, it begins to fall freely under the influence of gravity. A cold downdraft of air accompanies falling hailstones under thunderstorm conditions. Table V-7 illustrates the Torro Hailstorm Intensity Scale which outlines the typical damage impacts based on hail intensity.

TABLE V-7:
THE TORRO HAILSTORM INTENSITY SCALE (H0 to H10)

	Intensity Category	Typical Hail Diameter (mm)*	Typical Damage Impacts
H0	Hard Hail	5	No damage
H1	Potentially Damaging	5-15	Slight general damage to plants, crops
H2	Significant	10-20	Significant damage to fruit, crops, vegetation
H3	Severe	20-30	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
H4	Severe	25-40	Widespread glass damage, vehicle bodywork damage
H5	Destructive	30-50	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	Destructive	40-60	Bodywork of grounded aircraft dented; brick walls pitted
H7	Destructive	50-75	Severe roof damage, risk of serious injuries
H8	Destructive	60-90	Severe damage to aircraft bodywork
H9	Super Hailstorms	75-100	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
H10	Super Hailstorms	>100	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

* Approximate range since other factors (e.g. number and density of hailstones, hail fall speed and surface wind speeds) affect severity.

Thunderstorms, which have no geographical imitations to the area they affect, may produce hail. Therefore, all of Polk County is uniformly at risk to a hail event. Impacts typically include downed power lines and trees and damage to vehicles and mobile homes.

Hailstorms are an outgrowth of severe thunderstorms and cause nearly $1 billion in damage to property and crops on an annual basis in the United States. Typical thunderstorms can be 3 miles wide at the base, rise to 40,000 to 60,000 feet in the troposphere, and contain half a million tons of condensed water. Hailstorms are violent and spectacular phenomena of atmospheric convection, always associated with heavy rain, gusty winds, thunderstorms, and lightning.

Figure V.16: Hail storm; Source: Globe Views, http://golbe-views.com/dreams/hail.html Photographer unknown

Historical Occurrences

Incorporated areas of Polk County have experienced slightly more hail events than unincorporated Polk County, at 56 percent, and 44 percent, respectively. Lakeland has experienced the most hail events in the County, followed by Winter Haven, Auburndale, and Mulberry.

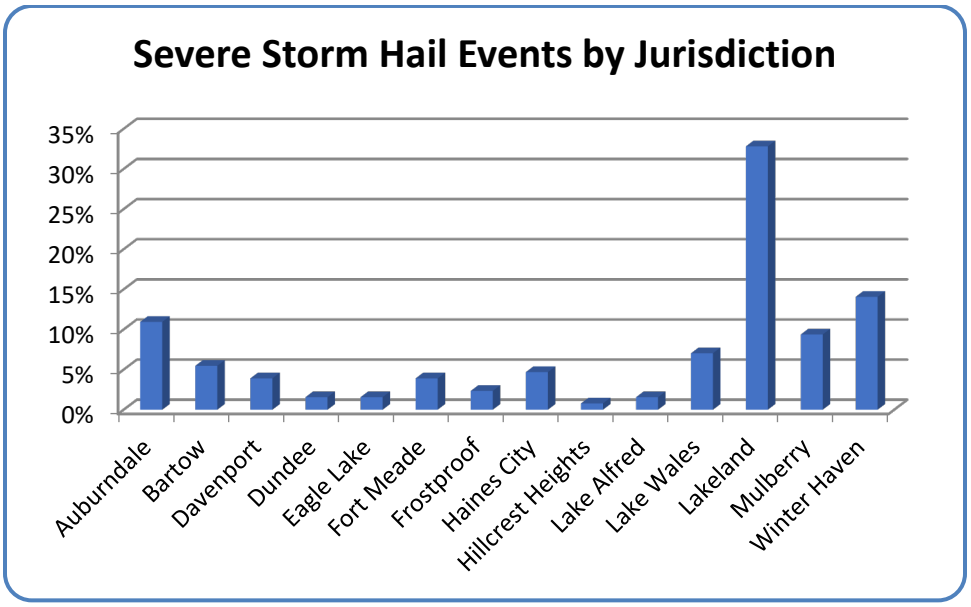


Figure V.17: Severe storm hail events; Source: SHELDUS

According to SHELDUS, 31 hail events occurred from 1960 through 2019. They were frequently associated with lightning, wind, and tornadoes. The results were two injuries, approximately $23,290 in crop damage, and approximately $8.7 million in property damage. There were 107 events, between 2000 and 2014, as reported NCEI. Table V-8 includes hail events from 2010-2018.

TABLE *V*-8:
HAIL INCIDENTS BY JURISDICTION (2010 – 2018)

Date	Location	Magnitude (in.)	Deaths	Injuries	Property Damage ($)	Crop Damage ($)
3/11/2010	Gibsonia	0.88	0	0	0	0
06/03/2010	Winter Haven	0.88	0	0	0	0
06/03/2010	Lake Wales	1.00	0	0	0	0
06/17/2010	Gibsonia	0.88	0	0	0	0
05/13/2011	Inwood	1.00	0	0	0	0
05/13/2011	West Frostproof	1.25	0	0	0	0
06/12/2011	West Lake Wales	1.00	0	0	0	0
06/15/2011	Foxtown	1.00	0	0	0	0
06/15/2011	Lake Alfred	1.00	0	0	0	0
06/15/2011	Lakeland	0.75	0	0	0	0
06/21/2011	West Frostproof	0.75	0	0	0	0
05/18/2012	Haines City	1.00	0	0	0	0
06/10/2013	Lakeland	0.88	0	0	0	0
06/20/2013	Wolfolk	0.88	0	0	0	0
05/29/2014	Fort Meade	1.00	0	0	0	0
06/15/2014	Polk County	1.75	0	0	0	0
06/15/2014	Polk County	1.50	0	0	0	0
07/20/2014	Lakeland Highlands	0.75	0	0	0	0
08/07/2014	Lake Wales	1.00	0	0	0	0
5/22/2015	Highland Park	1.00	0	0	0	0
5/22/2015	Lake Alfred	1.00	0	0	0	0
7/3/2015	Auburndale	1.00	0	0	0	0
7/11/2015	Auburndale	0.75	0	0	0	0
3/24/2016	Armour	0.88	0	0	0	0
3/26/2016	Loughman	1.00	0	0	0	0
3/26/2016	Davenport	1.50	0	0	0	0
3/26/2016	Lake Marion Lake	1.00	0	0	0	0
4/14/2016	Unincorporated Polk County	1.50	0	0	0	0
4/14/2016	Davenport	1.25	0	0	0	0
4/14/2016	Unincorporated Polk County	1.00	0	0	0	0
4/14/2016	Unincorporated Polk County	1.75	0	0	0	0

TABLE *V*-8:
HAIL INCIDENTS BY JURISDICTION (2010 – 2018)

Date	Location	Magnitude (in.)	Deaths	Injuries	Property Damage ($)	Crop Damage ($)
4/14/2016	Lake Wales Municipal Airport	1.00	0	0	0	0
4/6/2017	Homeland	1.00	0	0	0	0
7/21/2017	Country Club Estates	0.88	0	0	0	0
4/10/2018	Eaton Park	0.75	0	0	0	0

Source: National Oceanic and Atmospheric Association; www.ncdc.noaa.gov

Potential Impacts

Hail can damage structures, vehicles, and crops. The larger the hail, the more damage it can cause. Information provided by SHELDUS demonstrates indicates most hail events in the County produce penny to nickel sized hail. Approximately 18 percent of the hail measures between 1.25 inches and 4.5 inches. The Hazard Vulnerability and Risk Assessment Section (Section VI) includes a discussion of the impacts.

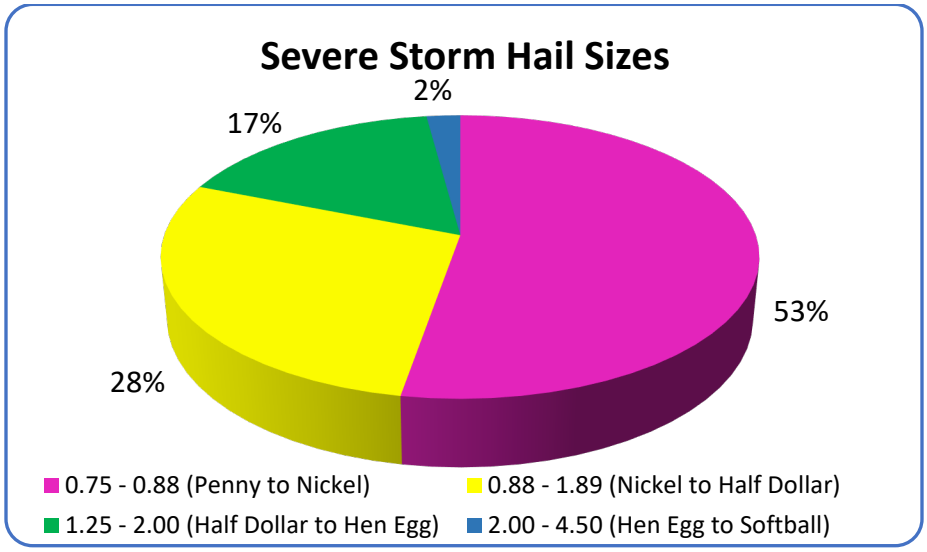


Figure V.18: Severe storm hail sizes; Source: SHELDUS

Probability of Future Occurrences

Due to the number and frequency of hail events in the County, the probability of hail events is high. The probability for hail events is higher for Lakeland, Auburndale, Mulberry, and Winter Haven. The County can expect to experience an average of three hail incidents per year.

Lightning

Description and Background

Lightning is a discharge of electrical energy resulting from the buildup of positive and negative charges within a thunderstorm, creating a "bolt" when the buildup of charges becomes strong enough. This flash of light usually occurs within the clouds or between the clouds and the ground. A bolt of lightning can reach temperatures approaching 50,000 degrees Fahrenheit. Lightning rapidly heats the sky as it flashes, but the surrounding air cools following the bolt. This rapid heating and cooling of the surrounding air causes thunder, which often accompanies lightning strikes. While most often affiliated with severe thunderstorms, lightning often strikes outside of heavy rain and might occur as far as 10 miles away from any rainfall.

Figure V.19: Lightning; Source: Shutterstock

Central Florida is the most lightning prone area in the United States with about 90 thunderstorm days a year. Because of this, Florida has more lightning deaths than any other state. Lightning kills more people in Florida than all other weather hazards combined. Florida's thunderstorm season has two general periods. Early May to early October is known as the wet season. Conversely, October through May is known as the dry season. Historically, the most dangerous months are June, July, and August due to an abundance of moisture, atmospheric instability, and storm triggering sea breezes. Moisture is almost always prevalent in the summer because Florida is a peninsula between the Gulf of Mexico to the west and the warm Atlantic Gulfstream to the east. Instability is a function of surface heat and cool air aloft that is present for most of the summer season. Thunderstorms need a trigger to start. The sea breeze that forms daily on the Atlantic and Gulf coasts may become the trigger. As a sea breeze forms, it typically moves inland (from the Atlantic or Gulf of Mexico) and dramatically aids thunderstorm formation. Surface winds also play a big part in determining which areas get the most lightning and at what time. With westerly morning winds across the peninsula, afternoon thunderstorms tend to accumulate on the east coast. If the morning winds are from the east, afternoon thunderstorms will cluster on the west coast.

Lightning seeks the path of least resistance on its way to and through the ground. The human body is a good conductor because of its large water content. Metal is a better conductor than most objects so lightning can travel easily through metal objects such as fences or railroad tracks, which can conduct electricity for long distances.

Polk County is in a region of the country that is particularly susceptible to lightning. Figure V.20 shows a lightning flash density per square mile map for the years 2008-2017 based upon data provided by Vaisala's U.S. National Lightning Detection Network (NLDN®). Lightning occurs randomly and is, therefore, impossible to predict where it will strike. The LMS assumes that lightning, which strikes in very small, specific geographic areas, uniformly impacts all of Polk County.

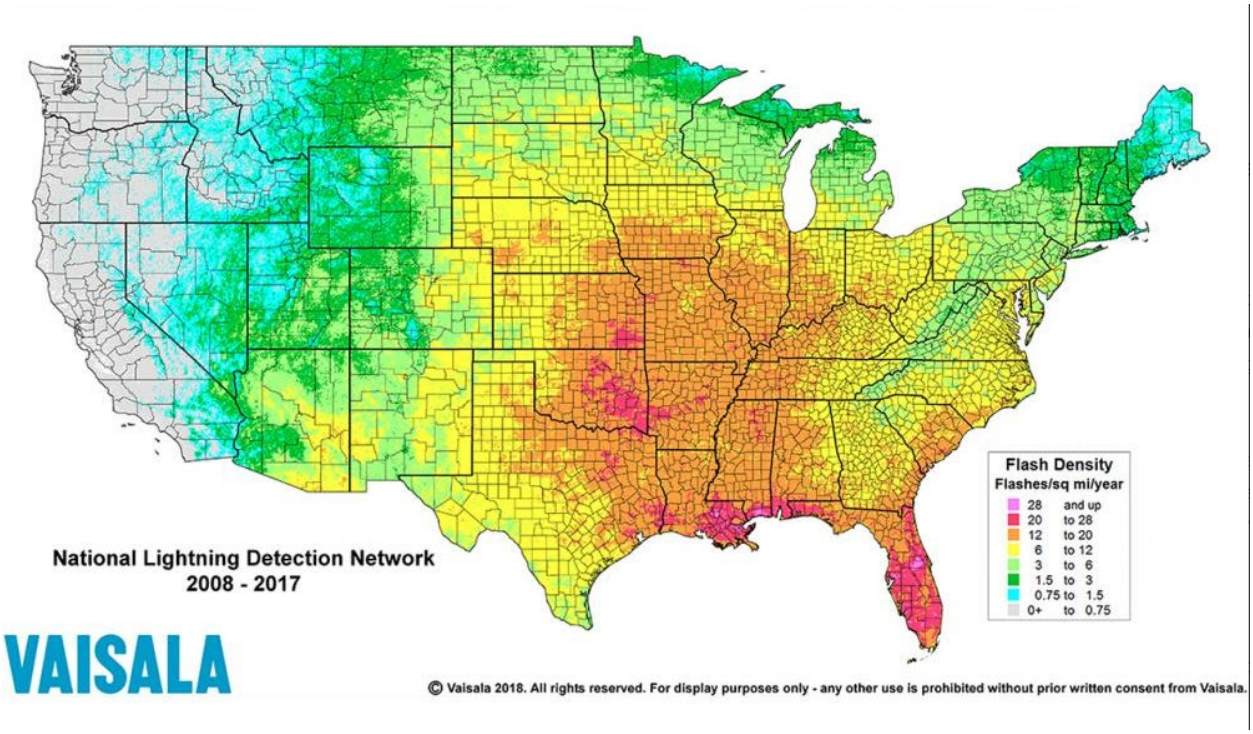


Figure V.20: Flash density per square mile 2008-2017; Source: Vaisala.com

As part of the lightning capital of the United States, Polk County has experienced several lightning strikes, many of which have caused property damage or resulted in death. Figure V.21 illustrates that between 1959 and May 2014, Polk County experienced the fifth highest rate of lightning deaths in Florida.

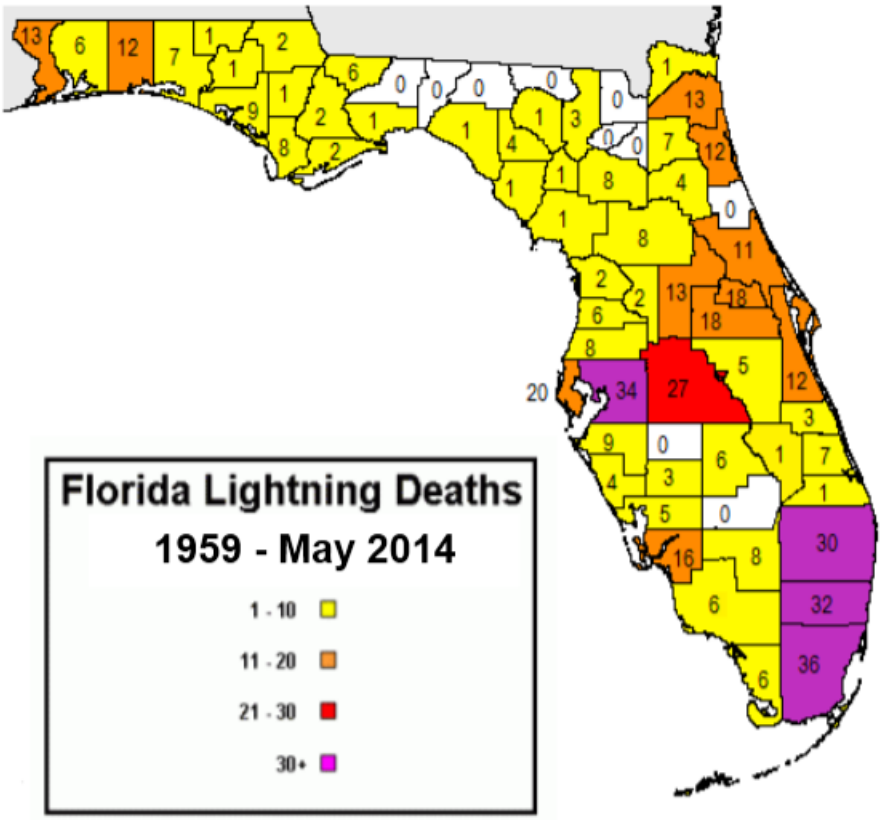


Figure V.21: Florida lightning deaths 1959-2014; Source: Hernandosheriff.org

Historical Occurrences

According to SHELDUS, 77 lightning events occurred from 1960 through 2019. The events resulted in 72 injuries, 25 fatalities, approximately $11,000 in crop damage, and approximately $3.1 million in property damage. Table V-9 provides 2009-2019 lightning incidents, as reported by NCEI.

TABLE V-9:
LIGHTNING INCIDENTS BY JURISDICTION (2009 – 2019)

Date	Jurisdiction	Death	Injuries	Property Damage ($)	Crop Damage ($)
5/14/2009	Bartow	0	0	190,000	0
6/16/2009	Davenport	0	0	50,000	0
7/4/2009	Winston	1	26	0	0
3/11/2010	Lakeland	0	0	0	0
8/27/2011	Carters Corner	0	9	0	0
5/18/2012	Lakeland Highlands	0	1	0	0
9/7/2012	Providence	1	0	0	0
6/1/2015	Polk City	0	1	10,000	0

TABLE V-9:
LIGHTNING INCIDENTS BY JURISDICTION (2009 – 2019)

Date	Jurisdiction	Death	Injuries	Property Damage ($)	Crop Damage ($)
8/26/2015	Mulberry	0	0	750,000	0
6/15/2018	Foxtown	0	0	25,000	0

Source: National Oceanic and Atmospheric Association; www.ncdc.noaa.gov

Potential Impacts

Lightning occurs randomly and is impossible to predict when and where it will strike. The LMS assumes lightning strikes can occur anywhere in Polk County. Impacts from lightning have included deaths and injuries, damage to electrical systems, and fires that have destroyed residential and commercial property.

According to FEMA, lightning injures an average of 300 people and kills an average of 80 people in the United States each year. Direct lightning strikes can also cause significant damage to buildings, electrical systems, critical facilities, and infrastructure. Lightning is responsible for igniting wildfires that can result in widespread damages to property before firefighters can contain and suppress the resultant fire. The Hazard Vulnerability and Risk Assessment Section (Section VI) includes a discussion of the impacts to specific assets.

Probability of Future Occurrences

The probability of occurrence for future lightning events in Polk County is high, with an anticipated 13 lightning strikes per square kilometer per year. Polk County is part of the area known as the Lightning Capital of the Western Hemisphere. Given the regular frequency of occurrence, future lightning events will continue to threaten life and property throughout Polk County.

Thunderstorms

Description and Background

Air masses of varying temperatures meeting in the atmosphere cause thunderstorms. Rapidly rising warm moist air fuels the formation of thunderstorms. Thunderstorms may occur singularly, in lines, or in clusters. They can move through an area very quickly or linger for several hours.

Thunderstorms are common throughout Florida and occur throughout the year. Although thunderstorms generally affect a small area, they are dangerous given their ability to produce accompanying hazards including high winds, hail, and lightning, which all may cause serious injury or death, in addition to property damage. According to the National Weather Service, more than 100,000 thunderstorms occur each year, though approximately 10 percent of these storms are classified as “severe.” A severe thunderstorm occurs when the storm produces one of three elements: 1) hail of three-quarters of an inch; 2) tornado; or 3) winds of at least 58 miles per hour.

Thunderstorms need three conditions to form: 1) moisture must form clouds and rain; 2) unstable air, such as warm air that can rise rapidly (which officials refer to as the “engine” of the storm); and 3) lift which in the form of cold or warm fronts, sea breezes, mountains, or the sun’s heat. Air masses of varying temperatures then meet, forming a thunderstorm. These storm events can occur singularly, in lines, or in clusters. Thunderstorms can move through an area quickly or linger for several hours.

The National Weather Service collected data for thunderstorms and lightning strike density for the 30-year period from 1948 to 1977 and generated a series of maps showing the annual average thunder event duration, the annual average number of thunder events, and the mean annual density of lightning strikes. Figure V.23 illustrates thunderstorm hazard severity based on the annual average number of thunder events from 1948 to 1977. Polk County averages 110 – 120 thunderstorm events annually.

Figure V.22: Storm in Lakeland on March 31, 2011. Source: YouTube, Photographer: Kisha Hartman

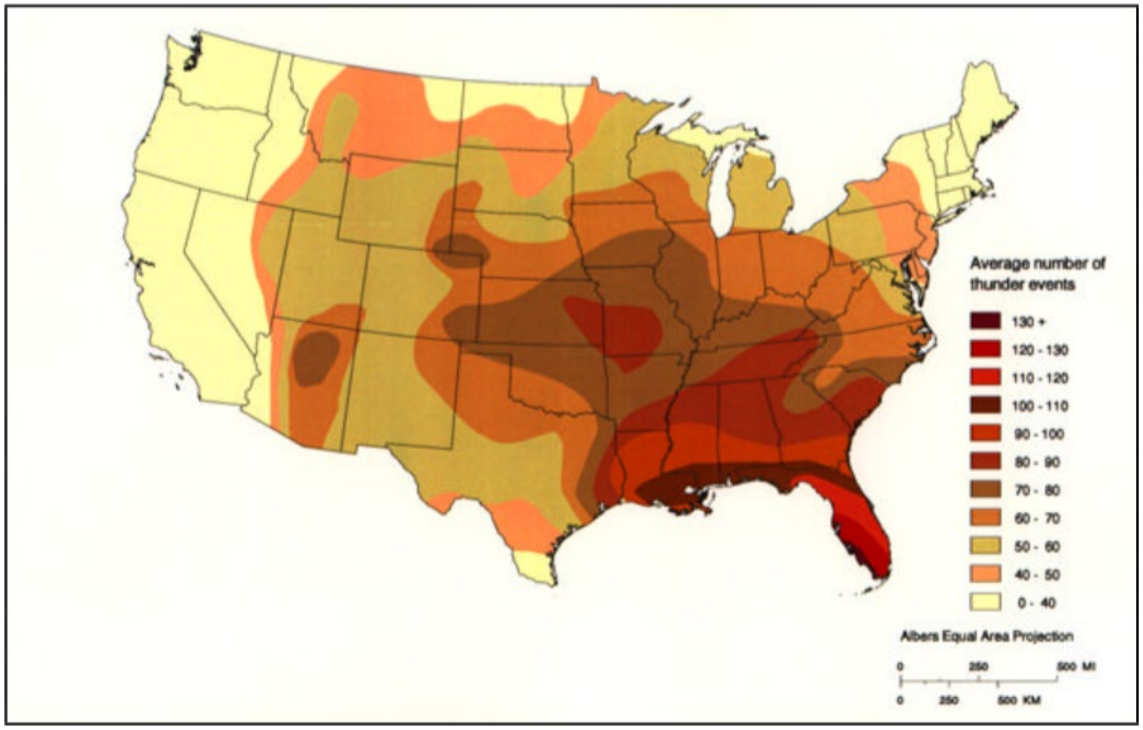


Figure V.23: Thunderstorm hazard severity based on the annual average number of thunder events from 1948-1977; Source: www.fema.gov

Table V-10 illustrates the Beaufort Wind Force Scale's effects on land, which is an empirical measure of related wind speed to observed conditions at sea or on land.

TABLE V-10:
THE BEAUFORT WIND FORCE SCALE – EFFECTS ON LAND

Force	Wind (Knots)	WMO Classification	Appearance of Wind Effects on Land
0	Less than 1	Calm	Calm, smoke rises vertically
1	1-3	Light Air	Smoke drift indicates wind direction, still wind vanes
2	4-6	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
3	7-10	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
4	11-16	Moderate Breeze	Dust, leaves, and loose paper lifted; small tree branches move
5	17-21	Fresh Breeze	Small trees in leaf begin to sway
6	22-27	Strong Breeze	Larger tree branches moving, whistling in wires
7	28-33	Near Gale	Whole trees moving, resistance felt walking against wind
8	34-40	Gale	Twigs breaking off trees, generally impedes progress
9	41-47	Strong Gale	Slight structural damage occurs, slate blows off roofs
10	48-55	Storm	Seldom experienced on land, trees broken or uprooted
11	56-63	Violent Storm	Widespread damage
12	64+	Hurricane	Structural damage

Geographical boundaries do not confine severe thunderstorms (typically widespread events) and their related hazardous elements (including lightning, hail, and straight-line winds). While thunderstorms can occur in all regions of the United States, they are most common in the central and southern states because atmospheric conditions in those regions are favorable for generating these powerful storms. The LMS assumes severe storms uniformly impact the entire County and that the spatial extent is large.

Historical Occurrences

March 31, 2011: A significant thunderstorm, with severe winds, caused a building at the Sun 'n' Fun Aviation Fair in Lakeland to collapse and trap approximately 70 people inside.

According to SHELDUS, 223 severe storm events occurred from 1960 through 2019. These events resulted in 20 injuries, 2 fatalities, approximately $35.5 million in crop damage, and approximately $52.4 million in property damage. Table V-11 includes events from 2015 to 2019, as reported by NCEI.

TABLE V-11:
SEVERE STORM INCIDENTS BY JURISDICTION (2015 – 2019)

Date	Location	Magnitude (kts. EG)	Deaths	Injuries	Property Damage ($)	Crop Damage ($)
6/1/2015	Lakeland	60	0	0	10,000	0
6/12/2015	Auburndale	45	0	0	5,000	0
6/23/2015	Winter Haven	40	0	0	10,000	0
6/25/2015	Rock Ridge	50	0	0	1,000	0
8/15/2015	Country Club Estates	40	0	0	10,000	0
8/19/2015	Pierce	50	0	0	5,000	0
1/17/2016	Frostproof	50	0	0	5,000	0
3/26/2016	Davenport	40	0	0	1,500	0
4/14/2016	Haines City	50	0	0	2,000	0
7/18/2016	Lake Parker	45	0	0	10,000	0
9/26/2016	Willow Oak	52	0	0	0	0
1/22/2017	Gibsonia	40	0	0	2,000	0
5/24/2017	Noxon	43	0	0	1,500	0
4/7/2018	Christina	40	0	0	20,000	0
11/2/2018	(Lal)Lakeland Municipal Airport	56	0	0	0	0
11/2/2018	Lakeland Highlands	57	0	0	0	0
11/2/2018	Polk City	55	0	0	5,000	0
4/19/2019	West Winter Haven	40	0	0	2,000	0
4/19/2019	Highland City	55	0	0	30,000	0
4/19/2019	Fountain Hgts	60	0	0	30,000	0
4/19/2019	Jack Browns Seaport	50	0	0	25,000	0
5/5/2019	Lakeland Highlands	51	0	0	0	0
5/14/2019	Loughman	60	0	0	3,000	0
5/14/2019	Loughman	45	0	0	0	0
6/9/2019	West Frostproof	50	0	0	0	0

Source: National Oceanic and Atmospheric Association; www.ncdc.noaa.gov

Potential Impacts

Severe storms are localized events that can impact the entire County and affect residents, visitors, transportation routes, utilities, businesses, crops, and livestock. Thunderstorms can cause flooding, property damage, and disruption of utility services such as power, telephones, or cable. Lightning strikes can ignite wildfires or structure fires. The damages from severe storms depend on when and where they occur and can vary based on wind and weather patterns. Generally, severe storms injure people because of exposure to objects and debris propelled by high winds, exposure to lightning strikes, flash flooding, and localized inundations. The Hazard Vulnerability and Risk Assessment Section (Section VI) includes a discussion of the impacts to specific assets.

Probability of Future Occurrences

Thunderstorms are frequent in Polk County. During the summer, Polk County experiences a thunderstorm nearly every afternoon. Based on the historical frequency of thunderstorm events in Polk County, the probability of future occurrences is high.

Severe Storm Wind Events

Probability of Future Occurrences

Most severe wind events in Polk County have occurred in incorporated areas (62 percent). Lakeland has experienced the most events, followed by Winter Haven, and Bartow.

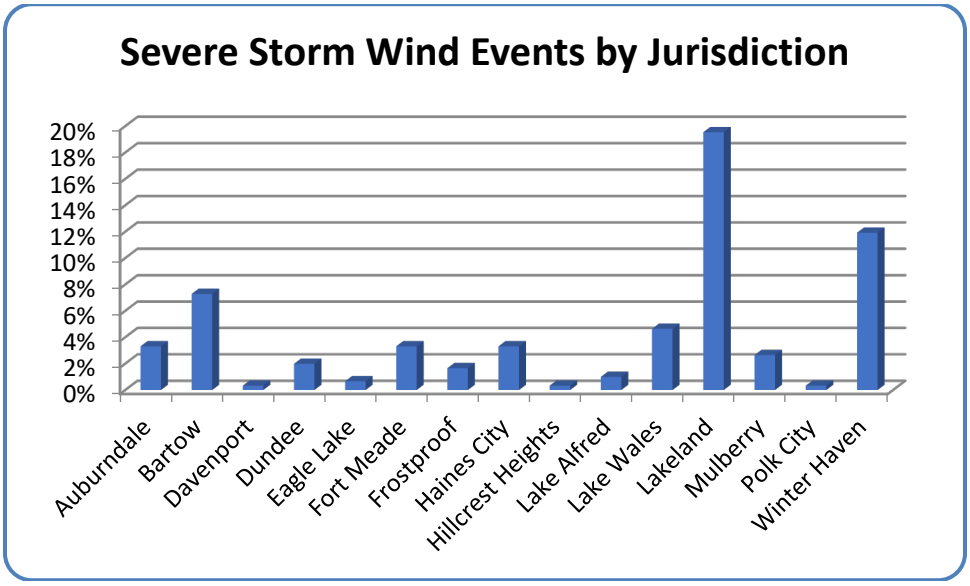


Figure V.24: Severe storm wind by jurisdictions

Tornadoes

Description and Background

A tornado is a violently rotating column of air that contacts the ground and is often visible as a funnel cloud. Its vortex rotates cyclonically with wind speeds ranging from as low as 40 mph to as high as 300 mph. Tornadoes frequently generate from thunderstorm activity when cool, dry air intersects and overrides a layer of warm, moist air forcing the warm air to rise rapidly. The destruction caused by

tornadoes ranges from light to catastrophic depending on the intensity, size, and duration of the storm. In general, the tornadoes that occur in Florida are less intense than those that occur in the Great Plains but can produce substantial damage (see Table V-12, Enhanced Fujita Intensity Scale).

Figure V.25: Severe Thunderstorms and suspect tornado cause damage at Lakeland Linder Airport. Source: Orlando Sentinel; Courtesy of Michael Daniels

Most tornadoes (70 percent) are weak and fall into the EF0-EF2 categories. Approximately 30 percent of all tornadoes are strong and can last 20 minutes or longer. Approximately 2 percent of all tornadoes fall into the EF-4 and EF-5 categories. Supercell thunderstorms spawn the most powerful tornadoes. Under the right conditions, horizontal wind shears (winds moving in different directions at different altitudes) impact these storms. The wind shears cause horizontal columns of air to rotate. This horizontal rotation may tilt vertically from violent updrafts, and the rotation radius can shrink, forming a vertical column of fast swirling air. This rotating air can eventually reach the ground, forming a tornado. At present, there is no way to predict exactly which storms will spawn tornadoes or where the tornadoes will touch down. Doppler radar systems have greatly improved the forecaster's warning capability, but the technology usually provides lead times from only a few minutes up to about 30 minutes. Consequently, early warning systems and preparedness actions are critical.

The Enhanced Fujita Intensity Scale (Enhanced F-scale) is a set of wind estimates (not measurements) based on damage (Table V-12). It uses three-second gusts estimated at the point of damage based on a judgment of eight levels of damage. These estimates vary with height and exposure. The three second gust is not the same wind as in standard surface observations. Weather stations take standard measurements in open exposures, using a directly measured "one-minute mile" speed.

TABLE V-12:
THE ENHANCED FUJITA INTENSITY SCALE

Category	Wind Speed	Potential Damage
EF-0	65 – 85 mph	**Light damage.** Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over.
EF-1	86 – 110 mph	**Moderate damage.** Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF-2	111 – 135 mph	**Considerable damage.** Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
EF-3	136 – 165 mph	**Severe damage.** Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
EF-4	166 – 200 mph	**Devastating damage.** Well-constructed houses and whole frame houses completely leveled; cars thrown and small missiles generated.
EF-5	> 200 mph	**Incredible damage.** Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yd); high-rise buildings have significant structural deformation; incredible phenomena will occur

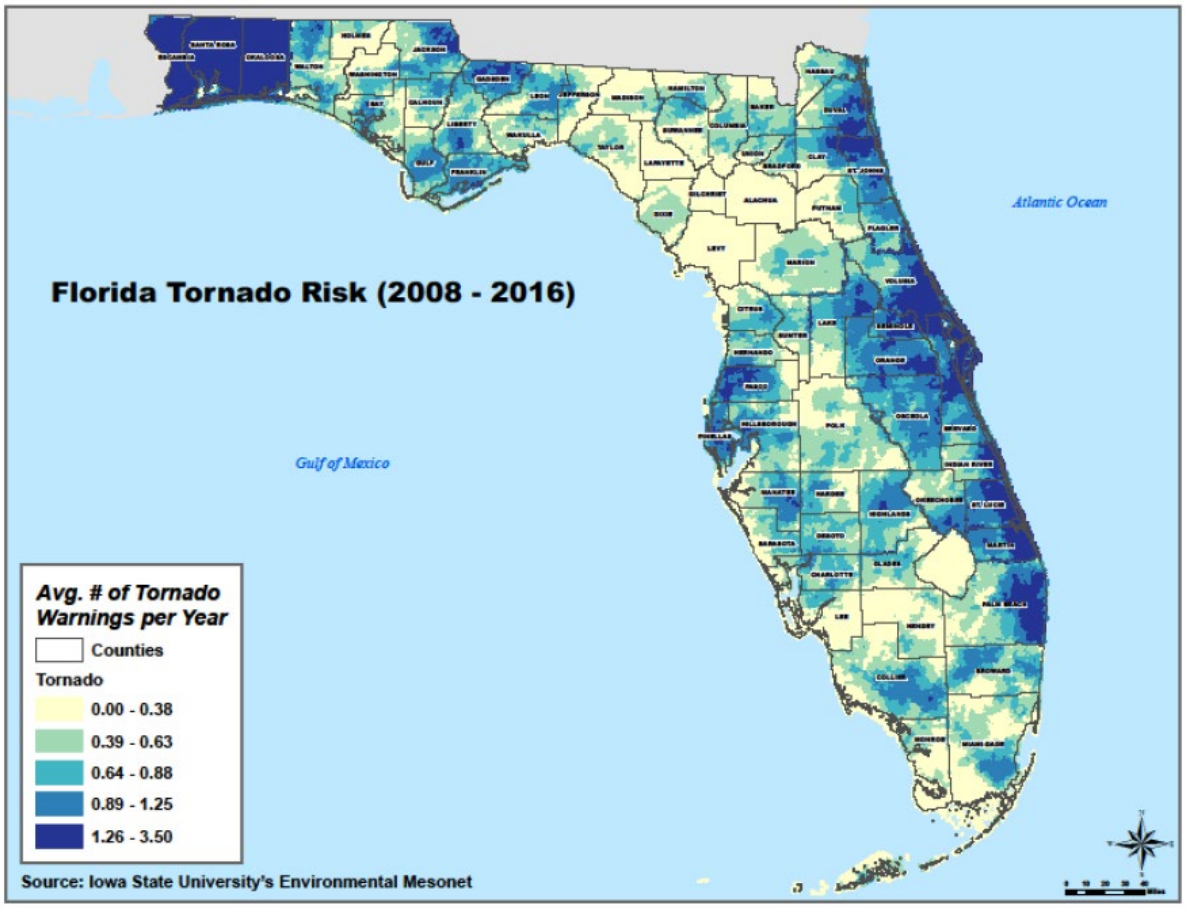


Figure V.26: Florida tornado risk (2008 – 2016); Source: 2018 State Hazard Mitigation Plan

Historical Occurrences

April 15, 1958 — The April 1958 Florida tornado outbreak was a severe weather event that affected the Florida peninsula. Of the tornadoes associated with this event, approximately 75 percent attained an F3 intensity or greater. The tornado in Polk County produced F4 damage, becoming one of only two F4 tornadoes recorded in Florida (the other occurred in 1966). According to NOAA, the event injured seven people and caused approximately $25,000 in property damages.

April 4, 1966 — The deadly 1966 Tampa tornado impacted the Interstate 4 corridor in Central Florida from the Tampa Bay area to Brevard County on April 4, 1966. Like the April 15, 1958 event, this tornado featured a path length over 100 miles (160 km) and produced estimated F4 damage. According to NOAA, the event killed eight people in Polk County, injured 450 people, and caused approximately $25 million in property damages. Officials credit a non-tropical cyclone with inducing the event.

October 18, 2019: — Thunderstorms associated with Tropical Storm Nestor generated at least three tornadoes, one of which was a long-track EF-2 tornado that inflicted

considerable damage to parts of western Polk County including the City of Lakeland.

According to SHELDUS, 128 tornado events occurred from 1958 through 2019, resulting in 187 injuries, three fatalities, approximately $17,000 in crop damage, and approximately $51.2 million in property damage. Table V-13 includes the tornado incidents from 2009 – 2019, as reported by NCEI.

TABLE V-13:
TORNADO INCIDENTS BY JURISDICTION (2009 – 2019)

Date	Location	Magnitude	Death	Injuries	Property Damage ($)	Crop Damage ($)
5/12/2009	Lake Parker	EF0	0	0	15,000	0
8/12/2009	Auburndale	EF0	0	0	35,000	0
3/11/2010	Auburndale	EF0	0	0	2,000	0
3/11/2010	Lake Marion Lake	EF1	0	0	200,000	0
3/31/2011	Lakeland Municipal Airport	EF1	0	0	500,000	0
3/31/2011	Prairie	EF0	0	0	5,000	0
3/31/2011	Socrum	EF0	0	0	0	0
6/24/2012	Winter Haven Cypress Gardens Area	EF0	0	0	4,000	0
6/24/2012	Winter Haven Cypress Gardens Area	EF2	0	0	390,000	0
6/1/2016	Highland Park	EF0	0	0	5,000	0
9/10/2017	Lakeland Mccollum Ar	EF2	0	0	20,000	0
12/20/2018	Fort Meade	EF0	0	0	5,000	0
12/20/2018	Crooked Lake Park	EF0	0	1	45,000	0
10/18/2019	(Lal)Lakeland Muni A	EF2	0	0	10,000,000	0

Source: National Oceanic and Atmospheric Association; www.ncdc.noaa.gov

Potential Impacts

Based on historic data, tornadoes occur throughout Florida at a rate of 1 to 10 confirmed touchdowns per 1,000 square miles. Florida tornadoes typically impact a relatively small area; however, events are completely random and it is not possible to predict specific areas that are more susceptible to a tornado strike over time. The LMS assumes that tornadoes uniformly impact all of Polk County. April, May, and June are considered the peak months for tornadoes in Florida.

Probability of Future Occurrences

According to historical records, Polk County experiences, on average, more than two confirmed tornado events annually. Based on the historical occurrence of tornadoes, the probability of a future tornado affecting Polk County is high. While most of these events are small in terms of size, intensity, and duration,

a minor tornado can cause substantial damage. Tornadoes pose a significant threat to lives and property in Polk County.

Hazard Profile – Geologic

A geologic hazard is one of several types of adverse geologic conditions capable of causing damage or loss of property and life.

Subsidence and Sinkholes

Description and Background

Sinkholes are a common, natural geologic feature of Florida's landscape. According to the Florida Department of Environmental Protection (FDEP), sinkholes are closed depressions in areas underlain by soluble rock such as limestone and dolostone, which form the Floridan aquifer system, and gypsum or salt. Sinkholes form when surface sediments sink, or subside, into underground voids created by the dissolving action of groundwater in the underlying bedrock. Sinkholes can form from dissolution of near surface rocks or by roof collapse of underground channels and caverns. Other events that can cause holes, depressions, or subsidence of the land surface that may mimic sinkhole activity include:

- Removal of water leading to the compression of subsurface expansive clay or organic layers,
- Collapsed or broken sewer and drain pipes;
- Broken septic tanks;
- Improperly compacted soil after excavation work; and
- Buried trash, logs, and other debris.

Figure V.27: Sinkhole in Kathleen Road from collapsed pipe

Sinkholes are one of many kinds of karst landforms, which include caves, disappearing streams, springs, and underground drainage systems, all of which occur in Florida. Karst is a generic term which refers to the characteristic terrain produced by erosional processes associated with the chemical weathering and dissolution of limestone or dolomite, the two most common carbonate rocks in Florida. Dissolution of carbonate rocks begins with exposure to acidic water. Most rainwater is slightly acidic and usually becomes more acidic as it moves through decaying plant debris.

The Florida Geological Survey developed a Sinkhole Type Area Map to depict the State's favorability to sinkhole formation based on natural dynamics in Florida's geology. The Sinkhole Type Area Map includes four distinct areas, all of which are present in Polk County.

- Area I: Region of exposed or thinly-covered carbonate rocks. Broad, shallow solution sinkholes dominate, with less common collapse sinkholes in areas with thicker overburden sediments.

- Area II: Region of incohesive, permeable sand ranging from 30 to 200 feet thick. Small cover subsidence sinkholes dominate, with less-common collapse sinkholes forming in areas with clayey overburden sediments.

- Area III: Region of cohesive, low-permeability clayey sediments ranging from 30 to 200 feet thick. Abruptly-forming collapse sinkholes dominate. The size of these sinkholes depends upon the thickness and bearing properties of the overburden sediments

- Area IV: Region of deeply-buried carbonate rocks. Overburden sediments are primarily cohesive clayey sands and interbedded carbonates in excess of 200 feet thick. Sinkholes are uncommon, but rare deep collapse types and small subsidence sinkholes formed in shallow shell beds or carbonate lenses are possible.

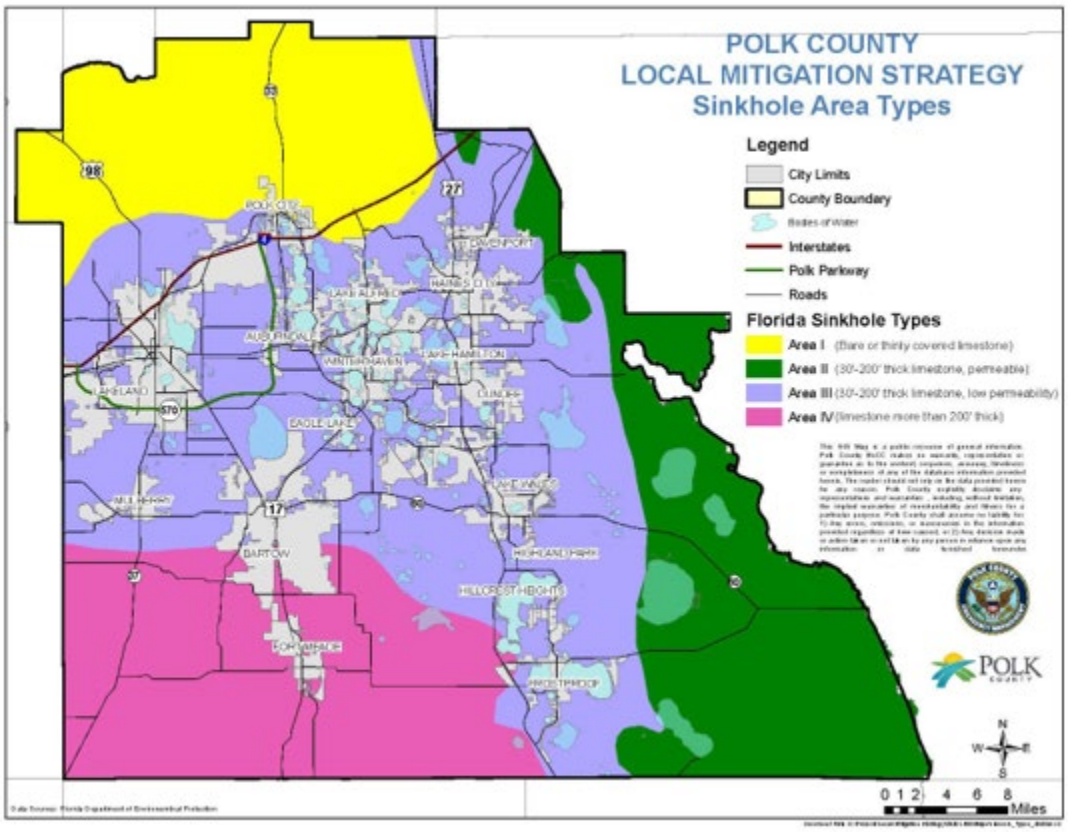


Figure V.28: Sinkhole area types

Three types of sinkholes are common in Florida: dissolution; cover-subsidence; and cover-collapse sinkholes. Sinkholes develop from dissolution and suffusion. Dissolution is the ultimate cause of all sinkholes, but the thickness and type of overburden materials and the local hydrology also control the type of sinkhole. Although it is convenient to divide sinkholes into three distinct types, sinkholes can be a combination of types, or may form in several phases.

Dissolution of limestone or dolomite is most intensive where water first contacts the rock surface. Aggressive dissolution also occurs where water flow focuses on pre-existing openings in the rock, such as along joints, fractures, and bedding planes, and in the zone of water-table fluctuation where ground water is in contact with the atmosphere. Cover subsidence sinkholes tend to develop gradually where the covering sediments are permeable and contain sand. Cover-collapse sinkholes may develop abruptly (over a period of hours) and cause catastrophic damages. They occur where the covering sediments contain a significant amount of clay (www.sinkholes.com).

Under natural conditions, sinkholes form slowly and expand gradually. However, activities such as dredging, constructing reservoirs, diverting surface water, and pumping groundwater can accelerate the rate of sinkhole expansions, resulting in the abrupt formation of collapse type sinkholes, some of which are spectacular. In Polk County, drought or low water table trigger many sinkholes (75 percent).

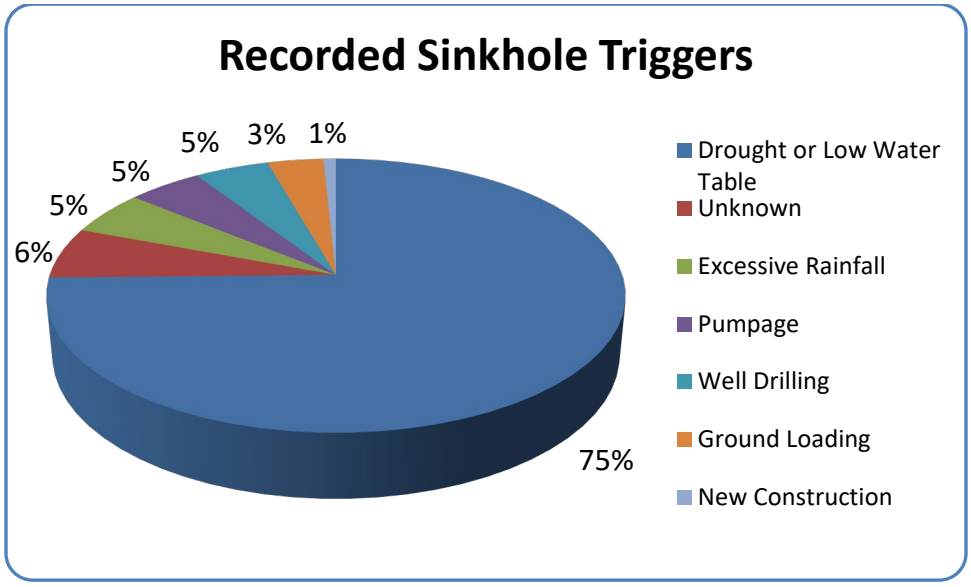


Figure V.29: Recorded sinkhole triggers; Source: Florida Geological Survey, October 2014

Officials measure sinkholes in length, width, and depth. The largest recorded sinkhole in Polk County was 225 feet long, 225 feet wide, and 50 feet deep. Another major sinkhole was 200 feet long, 200 feet wide, and 150 feet deep. Sinkholes of this extent are rare.

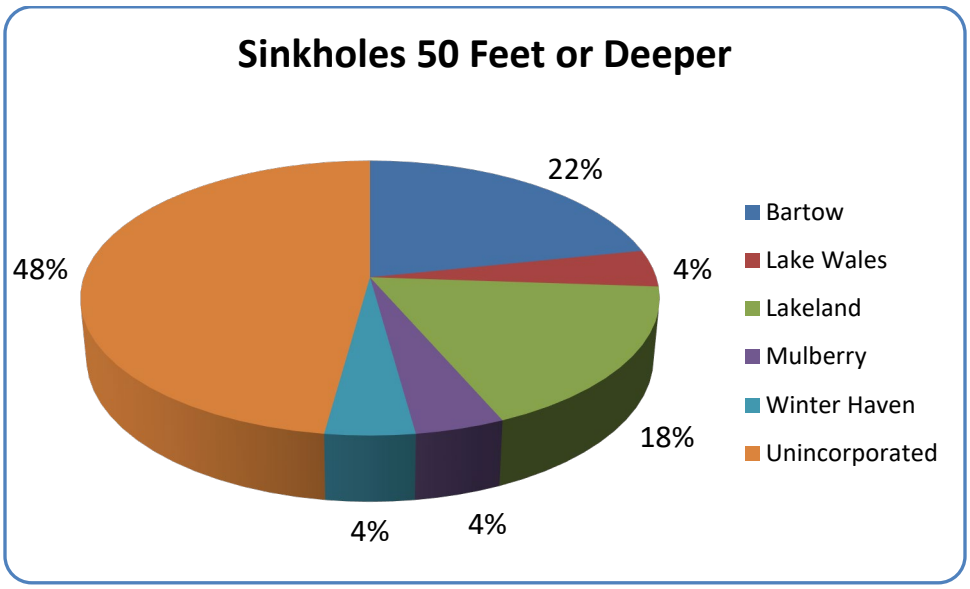


Figure V.30: Sinkholes 50 feet or deeper; Source: Florida Geological Survey

Historical Occurrences

The Florida Geological Survey maintains and provides a downloadable database of reported subsidence incidents statewide. A subsidence incident is a reported depression, which a Licensed Professional Geologist may or may verify by to be a true sinkhole, and the cause of the subsidence is unknown. The Subsidence Incident Report is the source for the information for the LMS.

Subsidence, including sinkholes, can occur all over the County. Most reported subsidence incidents (1954 through 2019) occurred in unincorporated Polk County (59 percent). Within the municipalities, Bartow had 45 percent of the recorded incidents, and Lakeland and Winter Haven experienced 20 percent and 10 percent respectively.

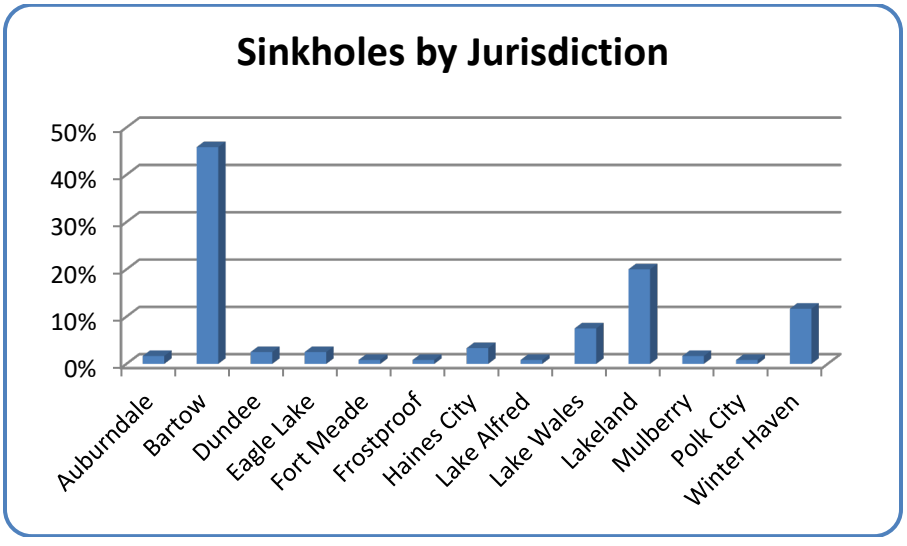


Figure V.30: Sinkholes by jurisdiction; Source: Florida Geological Survey

May 29, 2014 — A sinkhole opened in a parking lot at a Winter Haven Publix. The diameter of the sinkhole measured 30 feet; cracks extending from the sinkhole measured 140 feet.

The United States Geological Survey (USGS) recorded 34 subsidence incidents in Polk County between 2010 and 2019. The USGS list is dependent on the reporting of incidents meaning it is not a complete list of incidents since not all sinkholes are reported to USGS.

According to the Florida Geological Survey Subsidence Incidence Reports, approximately 20 percent of the incidents reported in Polk County caused property damage. Table V-14 includes a summary of subsidence incidents, by municipality, since 1954.

TABLE V-14:
SUBSIDENCE INCIDENTS BY JURISDICTION (1954-2019)

Jurisdiction	Number of Incidents	Comments
Auburndale	3	All under 15 feet deep; No property damage reported
Bartow	64	5 with a size of 50 feet or deeper; 1 caused property damage
Dundee	3	All in 1980s; All under 10 feet deep; one caused property damage
Eagle Lake	1	No additional information
Frostproof	1	No additional information
Haines City	2	No additional information
Lake Alfred	1	No additional information
Lake Wales	8	1 greater than 50 feet deep; 6 cause property damage; 6 caused by drought or low water table
Lakeland	24	4 greater than 50 feet deep; 9 caused property damage
Mulberry	2	11 greater than 50 feet deep
Polk City	1	No additional information
Winter Haven	12	11 greater than 50 feet deep
Unincorporated Polk County	156	11 greater than 50 feet deep
Polk County Public Schools locations	6	3 incidents caused property damage; 1 incident 170 feet deep

Sinkholes may also be associated with phosphate mining. Please refer to the subsection on phosphate mining for further discussion.

Potential Impacts

damage. Additional hazards associated with sinkholes include flooding, when water exceeds the natural capacity of the subsurface conduit, and pollutants on the land surface can potentially move rapidly into the underlying aquifer. Depending on the location of the sinkhole, severe damage can occur to individual properties or to roads and other infrastructure. In addition to structures and infrastructure, sinkholes may impact water supplies and environmental elements. In June 2006, the 285-acre lake known as Scott Lake abruptly drained after a sinkhole opened. In August 2016, a sinkhole opened underneath a gypsum stack resulting in water containing low-level radiation and other pollutants pouring into Florida's primary drinking water aquifer.

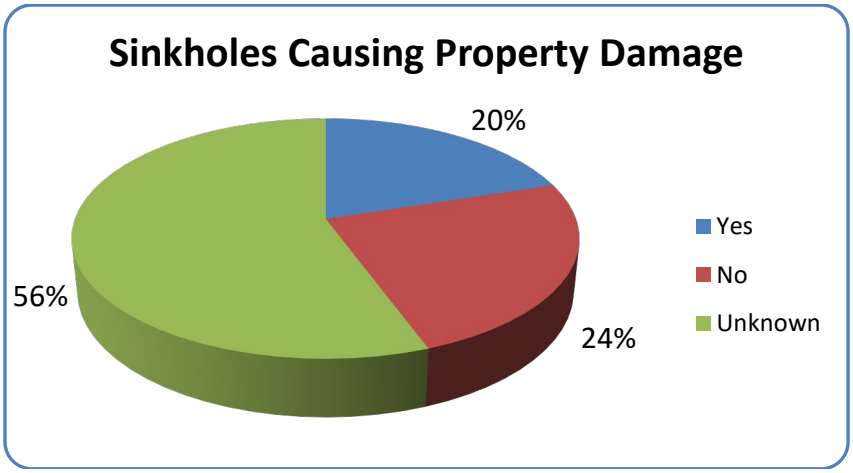


Figure V.31: Sinkholes Causing Property Damage;
Source: Florida Geological Survey

Probability of Future Occurrences

The entire County has the potential for sinkhole development. Periods of drought and heavy rain have created suitable conditions for their formation. A sinkhole is likely to occur at least once within any given year. This results in a medium to high probability of future occurrence.

Hazard Profile – Hydrologic

Hydrological (water) processes cause hydrologic hazards.

Drought

Description and Background

A drought is a prolonged period of less than normal precipitation such that the lack of water causes a serious hydrologic imbalance. Drought is a normal part of virtually all climatic regions, including areas with high and low average rainfall. Drought is the consequence of a natural reduction in the amount of precipitation expected over an extended period, usually a season or more in length. High temperatures, high winds, and low humidity can exacerbate drought conditions. In addition, human actions and demands for water resources can hasten drought-related impacts. Officials classify droughts into one of three types:

- Meteorological: The degree of dryness or departure of actual precipitation from an expected average or normal amount based on monthly, seasonal, or annual time scales.

- Hydrologic: The effects of precipitation shortfalls on stream flows and reservoir, lake, and groundwater levels.
- Agricultural: Soil moisture deficiencies relative to water demands of plant life, usually crops.

Droughts are slow-onset hazards, but over time can have very damaging effects on crops, municipal water supplies, recreational uses, and wildlife. If droughts extend over several years, the direct and indirect economic impact can be significant.

Historical Occurrences

Minor droughts occur every few years. They are usually associated with a "La Nina" event. The last occurrence was from 1999 to 2001. According to the National Weather Service website, the most serious event occurred in South Florida from May 2000 to May 2001. Below normal rains caused $100 million in crop damage.

- From December 2008 - May 2009, Polk County experienced a moderate drought, while some areas in the southwest part of the County experienced severe drought.

While officials have not declared a drought for Polk County since the 2010 LMS update, Polk County and jurisdictions have been on watering restrictions since the 2010.

General drought conditions were present throughout Florida in 1981, 1985, 1998-1999, 2000, and 2001. The Keetch Byram Drought Index is a numerical scale (0-800) that measures the amount of moisture in the soil. A zero indicates wet, full saturation conditions while an 800 represents extreme drought conditions. The index is used to assess the danger of wildfires and drought.

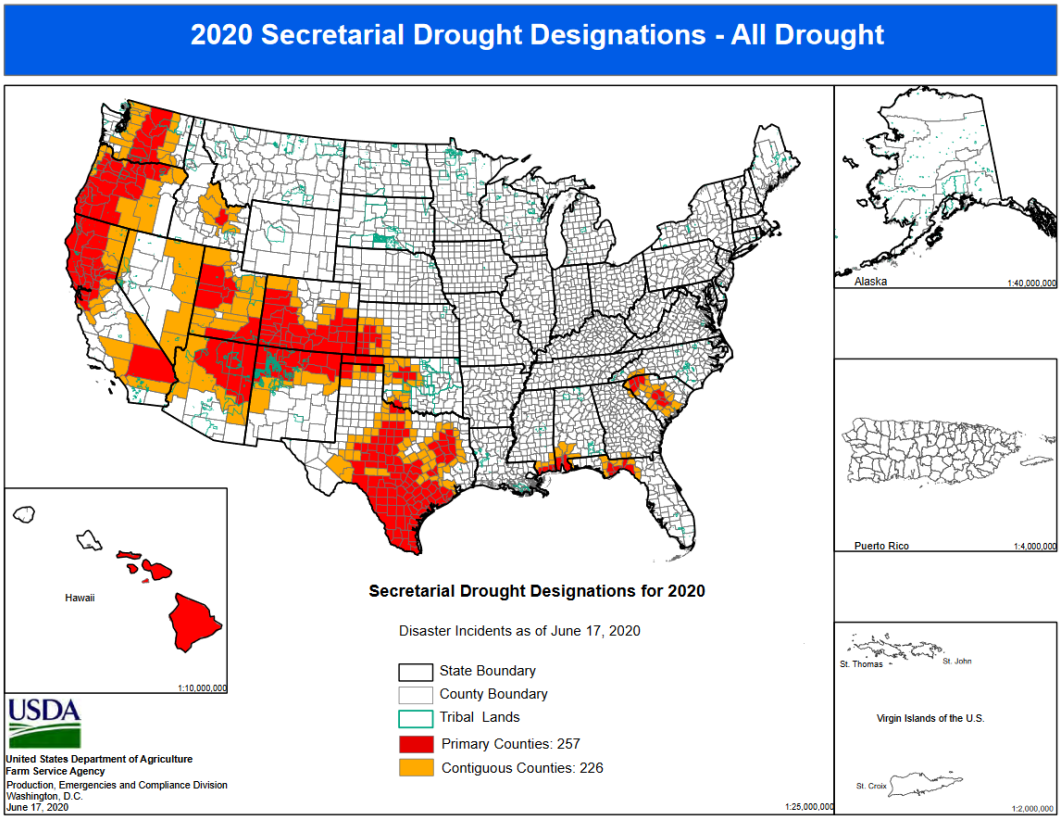


Figure V.32: 2020 Secretarial Drought Designations; Source: USDA Farm Service Agency 06/17/2020

Potential Impacts

Common effects of drought include crop failure, water supply shortages, and fish and wildlife mortality. High temperatures, high winds, and low humidity can worsen drought conditions and make areas more susceptible to wildfire. Human demands and actions can hasten or mitigate drought-related impacts on local communities.

Drought typically covers a large area that geographic or political boundaries cannot contain. According to the Palmer Drought Severity Index, Florida has a relatively low risk for drought hazard. However, local areas may experience much more severe and/or frequent drought events than what the Palmer Drought Severity Index map represents. Periods of drought can exacerbate the ignition of wildfires that can damage the natural and built environment.

The County's agricultural industry is at highest risk to drought. Drought can impact crops and livestock. Droughts also decrease the water supply, increase wildland fire danger, and increase the potential for sinkhole development for the entire County.

Probability of Future Occurrences

The LMS assumes that exposure to drought is uniform in Polk County, making the spatial extent potentially widespread. Drought may affect some areas of the County more severely than others. Given the frequency of previous events, warm temperatures, and average rainfall, the probability of future drought events is low to medium. As the County population continues to grow, water demands intensify, and demands

related to agriculture and livestock increase, drought conditions may begin to have a profound impact on the County. There is a medium probability that cycles of reduced rains will continue to cause hydrological droughts in the future. Polk County can expect a minor drought once every 2 to 3 years.

Flood

Description and Background

The National Flood Insurance Program (NFIP) website defines a flood as a general and temporary condition of partial or complete inundation of two or more acres of normally dry land area, or of two or more properties from:

- Overflow of inland or tidal waters;
- Unusual and rapid accumulation or runoff of surface waters from land source; or
- A mudflow.

The floodplain is the land adjoining the channel of a river, stream, ocean, lake, or other watercourse or water body that is susceptible to flooding. Floods are categorized as: riverine; coastal; or shallow flooding (where shallow flooding refers to sheet flow, ponding, and urban drainage).

Flooding is the most frequent and costly natural hazard in the United States, and has caused more than 10,000 deaths since 1900. Nearly 90 percent of presidential disaster declarations result from natural events where flooding was a major component.

Figure V.33: Flooded Streets in downtown Haines City, April 30, 2014 Source: Bay News 9, Photographer: Viewer Submitted

Floods generally result from excessive precipitation, and are classified as: general floods which include precipitation over a given river basin for a long period of time along with storm-induced wave or tidal action; or flash floods which are the product of heavy localized precipitation in a short time period over a given location. The severity of a flooding event is typically determined by a combination of factors including: stream and river basin topography and physiography; precipitation and weather patterns; recent soil moisture conditions; and the degree of vegetative clearing and impervious surface.

A general flood is usually a long-term event that may last for several days. The primary types of general flooding include riverine, coastal, and urban flooding. Riverine flooding is a function of excessive

precipitation levels and water runoff volumes within the watershed of a stream or river. Coastal flooding is typically a result of storm surge, wind-driven waves and heavy rainfall produced by hurricanes, tropical storms, and other large coastal storms. Urban flooding occurs where manmade development has obstructed the natural flow of water and decreased the ability of natural groundcover to absorb and retain surface water runoff.

Flash flooding is caused by slow-moving thunderstorms or by heavy rains associated with hurricanes and tropical storms. Flash flooding events may also occur from a dam or levee failure within minutes or hours of heavy amounts of rainfall, or from a sudden release of water held by a retention basin or other stormwater control facility. Although flash flooding occurs most often along mountain streams, it is also common in urbanized areas where impervious surfaces cover much of the ground.

The periodic flooding of lands adjacent to rivers, streams, and shorelines (land known as floodplain) is a natural and inevitable occurrence that takes place based upon established recurrence intervals. FEMA designates floodplains by the frequency of the flood that is large enough to cover them. The frequency of flood events, such as the 1 percent annual chance flood, is determined by plotting a graph of the size of all known floods for an area and determining how often floods of a particular intensity. Another way of expressing the flood frequency is the chance of occurrence in a given year, which is the percentage of the probability of flooding each year. For example, the 1 percent annual chance flood refers to area in the 100-year floodplain that has a 1 percent chance of flooding in any given year. Similarly, the 0.2 percent annual chance flood in the area of the 500-year floodplain has a 0.2 percent change of flooding in any given year. The recurrence interval of a flood is the average time interval, in years, expected between a flood event equaling, or exceeding, a specified magnitude. Flood magnitude increases with increasing recurrence interval.

Many areas of Polk County are susceptible to riverine and urban (stormwater) flooding. Figure V.34 and maps in Appendix A illustrate the location and extent of the Flood Insurance Rate Map.

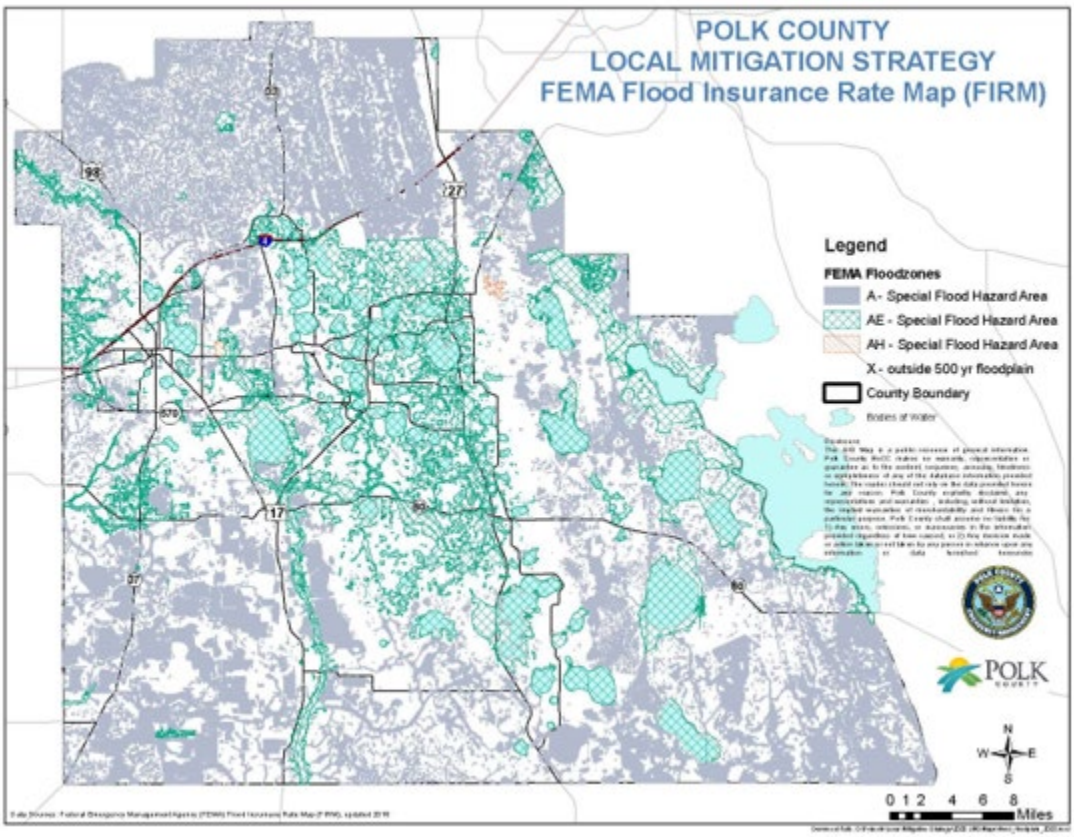


Figure V.34: FEMA Flood Insurance Rate Map Source: FEMA and Polk County

Natural Floodplain Functions

Floodplains left intact perform many natural functions including proving flood and erosion control, recharging our aquifers, improving surface water quality, and protecting ecologically sensitive areas. They support diverse populations of flora and fauna, providing outdoor areas to educate residents on the importance of protecting this valuable natural resource. In addition, they provide recreation and economic benefits to the community. There are several beneficial resources and functions of natural floodplains

Natural Flood Storage and Erosion Control

Floodplains provide areas to spread water out and temporarily store floodwater. This helps to reduce peak flood stages. In addition, the broad storage area diminishes the velocity of water flow, thus reducing erosion caused by fast moving water. In urbanized areas, natural floodplains can provide storage and/or result in less runoff that can be carried overland and lead to flooding in streets and neighborhoods.

Flood attenuation is particularly important in low-lying areas that can experience flooding during even relatively small storms. One acre of floodplain flooded a foot deep holds 330,000 gallons of water. Vegetated floodplains are especially advantageous due to the plants' structure hindering water movement, thus slowing the rate of flow that reaches the main water body. The diminished velocity provides erosion protection and stability to the banks of channels and lakes. Vegetation also reduces coastal shoreline erosion.

Water Quality and Aquifer Recharge

Natural floodplains not only provide runoff storage, but also serve to improve water quality by reducing the amount of contaminants including chemicals and unnatural levels of nutrients from reaching the main water bodies. In the process of suppression of water flow, vegetative floodplains allow sediments and debris to sink and settle within the floodplain. In natural floodplain areas outside of a main channel system, the water flow slows, giving more time to seep into the ground where it can help replenish the groundwater. As the water slowly seeps into the soil, natural purification of the water takes place as well.

Fish and Wildlife Habitat

Natural Floodplains support a wide variety of plants and animals. Natural floodplain habitats vary in the vegetation, with some having aquatic grasses and others being forested. What they have in common is that they are ephemeral, meaning there is a wet and dry period. The length of period in which they are wet also fluctuates. Floodplains and associated wetlands provide food and cover for both terrestrial and aquatic wildlife. The areas where water and land converge are generally more biologically diverse than the surrounding uplands. Natural floodplains are a critical habitat for several imperiled species such as the wood stork.

Recreation

Most of the natural floodplains and surrounding natural areas of Polk County provide many recreational opportunities including hiking, bicycling, fishing, boating, and wildlife viewing.

Economic Benefit

Natural floodplains have an economic value in the reduction of flood and storm damage to infrastructure. They also provide an economic benefit from the ecotourism dollars generated from people visiting the area for recreational activities and great birding opportunities

Protecting Our Natural Floodplains

Poor planning and development in floodplains can result in degradation of water quality, loss of habitats, loss of valuable property, erosion, and increase in severity and frequency of flood losses. Polk County and the municipalities' comprehensive plans provides strategies to address the protection of natural floodplains. Water Quality Management Plans identify locations and projects on public lands that enhance natural systems, including natural floodplains. These enhancements provide a diversity of benefits, such as increasing wildlife habitat quality, attenuating stormwater flows, enhancing downstream water quality, and reducing erosion and sediment loading. The County and municipalities implement these measures through a variety of ways, including development of water quality management plans, policies intended to protect environmentally sensitive lands, as well as regulations aimed at protecting wetlands.

City of Lake Alfred

In August of 2012 Reynolds Smith and Hill Inc. (RS&H) under contract to the Florida Department of Transportation (MOT) produced a study report to evaluate a flooding condition at the intersection of East Cummings Street and the northbound lanes of SR 600 (US 17/92) in Lake Alfred, Florida.

Based on field investigations of the flooding intersection, it was determined that flooding occurs on an irregular basis depending on the duration and intensity of rainfall. The system is capable of handling rainfall that occurs over an extended duration, but flooding occurs during significant short duration events. The flooding can cause vehicles to hydroplane and law enforcement is occasionally called to police the intersection and make sure that vehicles slow down. There is no evidence of significant private

property damage directly caused by the flooding and the road typically remains open to traffic. The flooding will reach the crown of the road within the intersection but eventually continues to flow south within the limits of the northbound lanes. The length of time that the intersection floods varies, but during a recent rainfall event, the roadway flooded for about 15-minutes before accumulated water receded.

Based on the results of the analysis, the existing collection system is severely undersized with a single 30-inch pipe serving as the outfall for over 200-acres of contributing area. Additionally, the existing inlets within the intersection of Cummings Street and the northbound lanes of SR 600 do not have enough throat capacity to handle existing runoff, due to significant impervious offsite area that contributes stormwater runoff into the intersection.

In 2017 the City and FDOT worked together to install a drainage pipe as a part of the FDOT stormwater project to alleviate drainage issues at Cummings St. & Lake Shore Way. The Stormwater project tied an additional drainage pipe into the drainage box near Cummings St. & Lake Buena Vista and runs parallel with the trail before draining into Lake Echo. In addition, the City installed a drainage culvert and sump pump further west of the intersection where water continued to collect to pump it into a small retention area.

Historical Occurrences

July 1, 2005	June rainfall of 14 to 18 inches in eastern Polk County increased lake levels from Lake Wales to Frostproof. The levels were high after three hurricanes moved over the area in 2004. Some lake levels rose 10 feet in a 12-month period. The flooding destroyed approximately 107 manufactured homes. Water surrounded approximately 175 of the 700 homes at Saddlebag Lake. The County performed pumping operations to lower lake levels. There are no natural outlets for most of the lakes in eastern Polk County. The damage estimates for this event were approximately $1.6 million.
April 6, 2008	Flooding occurred due to heavy rainfall in Auburndale, Bartow, Lakeland, and Haines City. Total property damage was about $50,000.
August 20, 2008	Flooding occurred due to heavy rainfall in the Frostproof area. Seven homes received up to 3 feet of water and total property damage was approximately $250,000.

According to SHELDUS, from 1960 through 2019, 25 flooding events occurred. They resulted in one injury, approximately $3.5 million in crop damage, and approximately $8.4 million in property damage. Table V-15 includes the flooding incidents from 2019- 2019 as reported by NCEI.

TABLE V-15:
FLOOD INCIDENTS BY LOCATION

Date	Location	Type	Deaths	Injuries	Property Damage ($)	Crop Damage ($)
08/15/2015	Eaton Park	Flood	0	0	100,000	0

Source: National Oceanic and Atmospheric Association; www.ncdc.noaa.gov

Historical Summary of Insured Flood Losses

All municipalities in Polk County, except the Town of Hillcrest Heights and the Village of Highland Park, participate in the NFIP. According to FEMA flood insurance policy records as of June 30, 2019, there have been 667 flood losses reported in Polk County totaling approximately $7.5 million in claims payments. Table 4-8 provides flood insurance policy and claim summary information for each of the jurisdictions. These numbers include losses to structures that were insured through NFIP policies, and losses in which people sought and received claims. It is likely that additional instances of flood losses in Polk County were either uninsured, denied claims payment, or not reported.

Repetitive Loss Properties

FEMA defines a repetitive loss property as any insurable building for which the NFIP paid two or more claims of more than $1,000 within any rolling 10-year period, since 1978. A repetitive loss property may or may not be currently insured by the NFIP.

According to FEMA repetitive loss property records (as of April 2009), there are 26 “non-mitigated” repetitive loss areas in Polk County based on topography (see Repetitive Loss Activity Map in Appendix A). These 26 properties are all located in unincorporated Polk County. Without mitigation, these properties will likely continue to experience flood losses. The City of Lakeland demolished the last repetitive loss property in the city in 2008. Table V-16 provides a summary of repetitive loss properties in Polk County.

TABLE V-16
REPETITIVE LOSS PROPERTIES

Type of Use	Number of Properties	Location
Residential	24	Unincorporated Polk County
Commercial (Office and Club/Lodge)	2	Unincorporated Polk County
Industrial (Light Manufacturing)	1	Unincorporated Polk County
Total	27	Unincorporated Polk County

Source: National Oceanic and Atmospheric Association; www.ncdc.noaa.gov

Polk County reviews and updates the list of repetitive loss properties, describes the causes of the losses, and coordinates outreach to those areas each year.

Potential Impacts

Floods can have devastating consequences and can impact the economy, environment, structures, and people. Floods, especially flash floods, may destroy roads, bridges, farms, houses, and automobiles. People may become homeless, and water supply and electricity service may be disrupted. Emergency responses are ordered to address impacts. It may take years for affected communities to re-build and business to return to normalcy. Chemicals and other hazardous substances may contaminate the water bodies. Flooding kills animals, introduces insects to affected areas, and may distort the natural balance of the ecosystem.

Probability of Future Occurrences

There is a long history of flooding in Polk County and most of central Florida. There is a medium probability of heavy flooding. Figure V.34 illustrates the probability of future flood events, based on magnitude and according to best available data, indicating those areas susceptible to the special flood hazard area.

Hazard Profile – Other Natural Hazards

Other Natural Hazards are natural hazards that are not categorized as atmospheric, geological, or hydrologic.

Climate Change

Description and Background

According to the Environmental Protection Agency (EPA), climate change refers to any significant change in the measures of climate lasting for an extended period. Climate change includes major changes in temperature, precipitation, or wind patterns, among other effects, that occur over several decades or longer. Earth's average temperature has risen by 1.4°F over the past century, and may rise another 2°F to 11.5°F over the next hundred years. Small changes in the average temperature of the planet can translate to large shifts in climate and weather. This hazard occurs at a regional geographic level; therefore, climate change is likely to uniformly expose the entire County.

Historical Occurrences

No specific events have been reported since the 2015 LMS update. Figure V.35 illustrates the historic average annual temperatures for Polk County. As illustrated in the figure, the average annual temperature for Polk County has risen 4.8°F in the last 125 years.

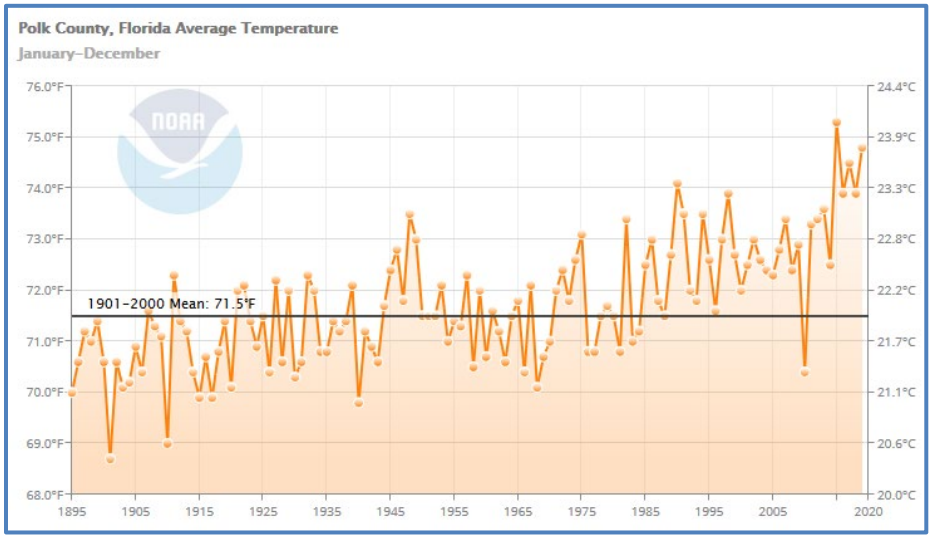


Figure V.35: Polk County mean temperature; Source: NOAA

Potential Impacts

According to the EPA, changes in weather and climate accompany rising global temperatures. Many places have seen changes in rainfall, resulting in more floods, droughts, or intense rain, as well as more frequent and severe heat waves. The planet's oceans and glaciers have also experienced changes: oceans are warming and becoming more acidic; ice caps are melting; and sea levels are rising. As these and other changes are predicted to become more pronounced in the coming decades, they will likely present challenges to society and the environment. Climate change has the potential to impact food supply, water resources, infrastructure, ecosystems, and health. In recent years, scientists have observed changes in Florida that they believe to be consistent with the impacts of climate change. These changes include retreating and eroding shorelines, dying coral reefs, salt-water intrusion into the freshwater aquifer, increasing numbers of forest fires, and warmer air and sea surface temperatures. The most likely impacts to centrally located Polk County may include fresh water supplies, human health, agriculture, natural ecosystems, and hurricanes.

Potential salt-water intrusion into the Floridan aquifer may limit the supply of fresh water to Polk County. The economic, agricultural and health impacts of a limitation of fresh water supply are difficult to predict. Increases in average temperature will have an impact on the severity and frequency of severe storms, including hurricanes, and droughts. Much of the impact will be dependent upon the ability to adapt, using technology and other innovations, to protect against such storms and droughts.

Heat waves are expected to increase by the end of the century. High temperature stresses in the summer will become more frequent and damaging to agriculture, possibly moving dairy and livestock production farther north and reducing yields of citrus, blueberries, peaches, and other crops. Climate change will affect every aspect of water resource management, including water quantity and quality, natural systems protection, flood protection, and drought management. The Regional Water Supply Plan for Polk County will address these changes.

Probability of Future Occurrences

The EPA predicts future changes in temperatures, precipitation, and storm events. The magnitude and rate of future climate change depends on several factors. The probability of future occurrences for Polk County is medium, based on the historical occurrences of increased temperatures and the projected changes in temperatures and the impacts they can cause. The County can expect to experience an event tied to climate change in the next ten years.

Wildfire

Description and Background

The Florida Forest Service (FFS) defines wildfire as any fire that does not meet management objectives or is out of control. Wildfires occur in Florida every year and are part of the natural cycle of fire-adapted ecosystems. Suppression of many of these fires occur before they can damage property. Many conservation and ranch properties across the State utilize prescribed or controlled fires to replace the natural benefits that wildfires provide. Despite the advancements of fire management across the State, many large and destructive wildfires occur during severe droughts. Nationally, negligent human behavior such as smoking in wooded areas or improperly extinguishing campfires start over 80 percent of forest fires. The second most common cause for wildfire is lightning.

According to the 2018 Florida Enhanced State Mitigation Plan, there are four types of wildfires.

- Surface Fires: Fires that burn along the forest floor consuming the litter layer and small branches on or near the ground.

- Ground Fires: Fires that smolder or creep slowly underground. These fires usually occur during periods of prolonged drought and may burn for weeks or months until sufficient rainfall extinguishes the fire, or it runs out of fuel.

- Crown Fires: Fires that spread rapidly by the wind, moving through the tops of the trees.

- Wildland/Urban Interface (WUI) Fires: Fires occurring within the WUI in areas where structures and other human developments meet or intermingle with wildlands or vegetative fuels. Homes and other flammable structures can become fuel for WUI fires.

Both public and private lands across the State utilize prescribed or controlled fires to replace the natural benefits that wildfires can provide. Prescribed burns help reduce the amount of flammable vegetation in an area, which lessens the intensity of a wildfire that may occur in that same area. Firefighters then have an opportunity to suppress the fire while it is small and easier to control. Humans cause approximately 70 percent to 80 percent of all wildfires in Florida.

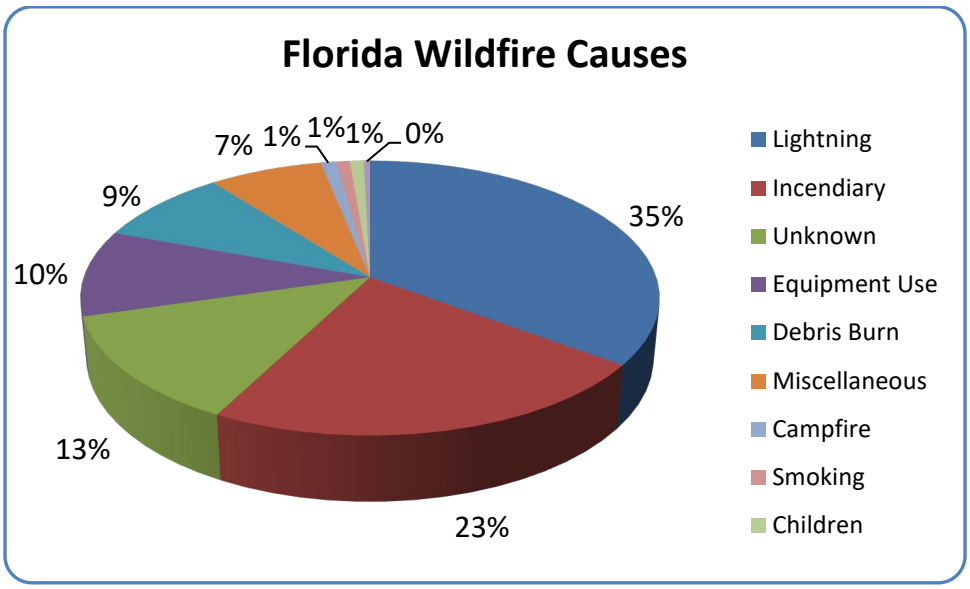


Figure V.36: Florida wildfire causes

The type and amount of fuel, as well as its burning qualities and level of moisture, affect wildfire potential and behavior. The continuity of fuels, expressed in horizontal and vertical components, is a factor because it expresses the pattern of vegetative growth and open areas. Topography affects the movement of air (and thus the fire) over the ground surface. The slope and shape of terrain can change the rate of speed at which the fire travels. Temperature, humidity, and wind (both short- and long-term) affect the severity and duration of wildfires.

The wildland/urban interface is the line, area, or zone where structures and other development meet or intermingle with undeveloped wildland or vegetative fuels. Population growth within the WUI substantially ingresses the risk from wildfire. Appendix E includes the Southern Wildfire Risk Assessment Summary Report for Polk County generated from the Southern Wildfire Risk Assessment (SWRA) web Portal (SouthWRAP).

Historical Occurrences

According to the Polk County Community Wildfire Protection Plan (2011), there have been 263,439 acres burned from wildfires in Polk County in the past 30 years. Most fires have been under 10 acres. This amount does not include brush fires that local firefighters suppressed without FFS assistance.

FFS includes one fire in Polk County on its Significant Wildfires in Florida 1981-2018 list.

February 15, 2001	The Stagecoach Fire burned approximately 11,000 acres of mainly grass, scrub trees and shrubs along and north of the Interstate 4 corridor over mainly rural portions of northern Polk County. Officials closed approximately 17 miles of Interstate 4 between Polk City and Lakeland for 10 days due to billowing smoke, burned fence posts that allowed cattle on the road, and zero visibility. Officials believe a trash fire is the cause of the wildfire. The variable smoke plume produced by the wildfire

occasionally reduced visibility to between one half and two miles as far west as St. Petersburg in Pinellas County. The fire deposited ash from the smoke plume as far southwest as Ft. Myers.

According to SHELDUS, 8 wildfire events occurred from 1960 through 2018. They resulted in five injuries and approximately $4.5 million in property damages. Table V-17 includes the wildfire incidents from 2009-2019 as reported by NCEI.

TABLE V-17:
WILDFIRE INCIDENTS BY JURISDICTION (2009-2019)

Date	Jurisdiction	Death	Injuries	Property Damage ($)	Crop Damage ($)
2/5/2017	Polk City	0	0	1,100,000	0
4/21/2017	Polk County	0	0	75,000	0
4/26/2017	Polk County	0	0	50,000	0

Source: National Oceanic and Atmospheric Association; www.ncdc.noaa.gov

Potential Impacts

Wildfires may affect all jurisdictions in the County since the area consists of agricultural and conservation lands. Many individual homes and cabins, subdivisions, resorts, recreational areas, organizational camps, businesses, and industries are located within high wildfire hazard areas. The increasing demand for outdoor recreation places more people in wildlands during holidays, weekends, and vacation periods. Wildfires can result in severe economic losses. Businesses that depend on timber, such as paper mills and lumber companies, experience losses that they often pass along to consumers through higher prices. They also may experience job losses. The high cost of responding to and recovering from wildfires can deplete State resources and increase insurance rates. The tourism industry may also be impacted by wildfires if wildfires close roads and tourist attractions due to health and safety concerns.

Probability of Future Occurrences

Wildfire probability depends on local weather conditions, outdoor activities such as camping, debris burning, and construction, and the degree of public cooperation with fire prevention measures. Drought conditions and other natural hazards, such as tornadoes, hurricanes, etc., increase the probability of wildfires by producing fuel in urban and rural settings. Forest damage from hurricanes and tornadoes may block interior access roads and firebreaks, down overhead power lines, or damage pavement and underground utilities. There is a high probability of future wildfire events in Polk County, especially during drought cycles and abnormally dry conditions, based on prior occurrence.

Controlled/prescribed burns are used to control wildfire outbreaks by burning the underbrush that contributes to fueling flames. Because of these regularly scheduled burns, the likelihood of a major wildfire is medium, which is one event every four to five years. During periods of drought, the probability increases from medium to high, which is approximately one event every year (See Appendix A).

Hazard Profile – Human-Caused Hazards

Human-caused hazards can result in human-caused disasters. Human-caused hazards have an element of human intent, negligence, or error, or involve a failure of a human-caused system. This is as opposed to natural hazards that cause natural disasters.

Civil Disturbances/Terrorism

Description and Background

Events or conditions including social unrest, political activism, unstable economic conditions, or radical antigovernment/anti-establishment movements can generate civil disturbances. While the risk of large-scale civil disturbances in Polk County is low, current trends and indicators suggest that the potential for civil disturbances at some level will remain present for the mid to long-term period.

Prior to September 11, 2001, Polk County considered the probability of civil disturbance or terrorist activity to be very low. Terrorist attacks on New York and Washington D.C. resulted in a dramatic increase in the potential threat to the entire nation and a major change in planning priorities. The threat to Polk County remains low in relation to other areas in the State where there are major port and terminal operations and/or military facilities. Potential terrorist strategies and targets, and the possible requirement to provide mutual aid support to other areas, dictate a continuing commitment to planning, training, and acquisition of resources in support of Homeland Security initiatives in Polk County. The County's Comprehensive Emergency Management Plan addresses Civil Disturbance/Terrorism.

Historical Occurrences

No identified occurrences reported at this time. The LMS Working Group will continue to monitor this hazard.

Potential Impacts

Civil disturbances and terrorism can have an overwhelming direct and indirect impact on a population. Direct costs are associated with the hardening of structures and the addition of security personnel to work to prevent potential events.

Probability of Future Occurrences

The probability of future occurrences is low based on Polk County's history. However mass shootings have occurred in neighboring and nearby counties.

Cyber-Attacks

Description and Background

A cyber-attack is an assault launched by cybercriminals using one or more computers against single or multiple computers or networks. A cyber-attack can maliciously disable computers, steal data, or use a breached computer as a launch point for other attacks. Cyber-attacks are also infamous for attacking computer infrastructure and personal computers.

In addition to cybercrime, cyber-attacks can also be associated with cyberwarfare or cyberterrorism, particularly in instances when the attackers are State actors, groups, or affiliated organizations. For example, in 2014 a group hacked Sony Pictures and stole troves of data, including many Sony Pictures

employees' personal information, executive salary information, copies of unreleased films, and more. The group, which officials suspect to be North Korean, or affiliated with North Korea, used a Shamoon wiper malware to obliterate Sony Pictures' computer infrastructure.

The public identified cyber-attacks as a major concern during the LMS Update planning process (See Appendix C).

Historical Occurrences

While specific details are not available, there have been cyber-attacks on local governments in the County. These are generally incidents that go unreported or underreported.

Potential Impacts

Critical infrastructure, financial components, government, and private citizens are targets of cyber-attacks. Cyber-attacks cause financial impacts as government, business, and private citizens pay money for protective measures and potentially suffer losses to identity theft.

Probability of Future Occurrences

The probability of future occurrences is high as this is an underreported hazard that potentially touches each individual, company, and level of government. As more jurisdictions and businesses provide services through digital formats, the potential for cyber-attacks increases.

Dam/Levee Failure

Description and Background

A dam is a barrier constructed to hold back water and raise its level while a levee is a structure designed to prevent or control a flood. The LMS uses the terms interchangeably. The National Inventory of Dams defines any "major dam" as being 50 feet (15 m) tall with a storage capacity of at least 5,000-acre feet (6,200,000 m^3), or of any height with a storage capacity of 25,000-acre feet (31,000,000 m^3). Water control structures help provide flood protection, manage lake water levels, and prevent salt water from flowing into freshwater streams and creeks. The term "Dam" makes most people think only of structures associated with the impounding of rivers for use as drinking water reservoirs, the production of electricity, or flood control. In Florida, the term can take on an additional meaning, that of impounding clay settling ponds or phosphogypsum stacks associated with the mining and processing of phosphate. Both types of dams occur within Polk County.

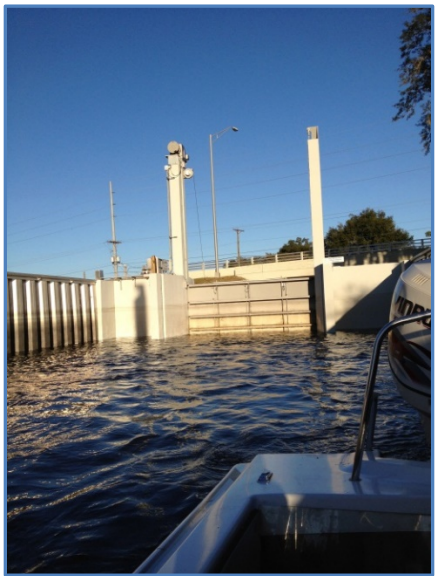


Figure V.37: Chain of Lakes Lock System; Source: worldbarefootcenter.com

According to FEMA, dams can fail for one or a combination of the following reasons:

- Overtopping caused by floods that exceed the capacity of the dam;
- Deliberate acts of sabotage;
- Structural failure of materials used in dam construction;
- Movement and/or failure of the foundation supporting the dam;
- Settlement and cracking of concrete or embankment dams;
- Piping and internal erosion of soil in embankment dams; or
- Inadequate maintenance and upkeep

A flood event may also trigger dam/levee failure. The dam impounds water in the reservoir, or upstream area. Officials measure the amount of water impounded in acre-feet. Dam failures are not routine but the impacts can be significant. Two factors influence the potential severity of a dam failure: (1) the amount of water impounded and (2) the density, type, and value of the development downstream.

"Dam hazard" is a term indicating the potential hazard to the downstream area resulting from failure or mis-operation of the dam or facilities. According to the U.S. Army Corps of Engineers National Inventory of Dams, there are 307 dams in Polk County. The U.S. Army Corps of Engineers National Inventory of Dams identifies each of the dams by their hazard risk of low, significant, and high.

- Low hazard: A dam where failure or mis-operation results in no probable loss of human life and low economic and/or environmental loss. Losses generally occur on the owner's property.

- Significant hazard: A dam where failure or mis-operation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns. These dams are often located in predominantly rural or agricultural areas but may also be located in populated areas with significant infrastructure.

- High hazard: A dam where failure or mis-operation may cause loss of human life.

Figure V.39 illustrates general locations of structures in Polk County identified through the National Inventory of Dams. Most dams occur in the southwest portion of the County, with some in the northeast and along the Kissimmee River in the southwest portion. Mining operations that have dams in Polk County are in the southwestern portion of the County. Most dams in Polk County are: under private ownership (93 percent); are earthen dams (78 percent); have the primary purpose of holding tailings (86 percent).

- Phosphate mining has moved through Lakeland, Mulberry, Bartow, and Plant City. In the past 20 years, mining operations on Polk County's southern fringe has decreased. The closing of the IMC Clear Springs and Noralyn mines in 2000 has signaled a close to active mining in what has been the heart of the mining district since the mining of phosphate pebble on land began in the late 1800s (Florida Industrial and Phosphate Research Institute).

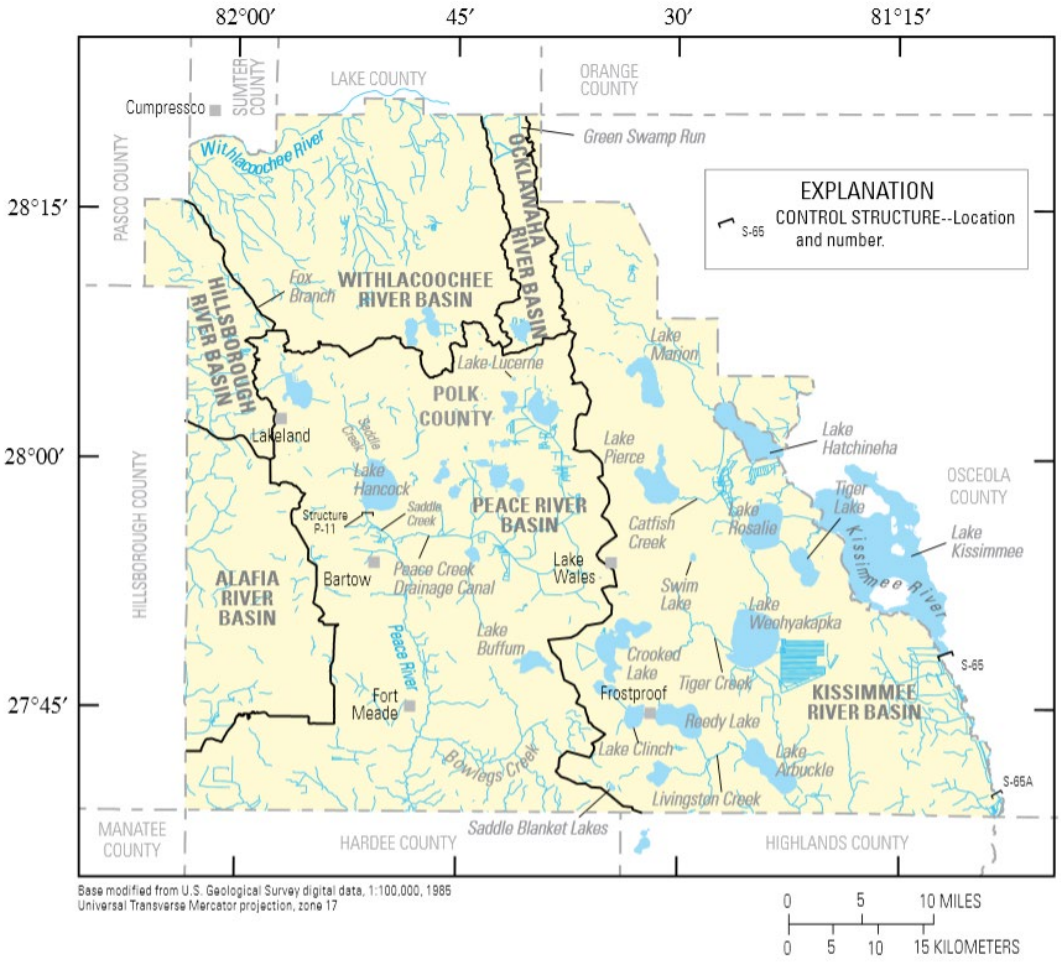


Figure V.38: Major surface-water drainage basins, tributaries, and lakes
Source: Hydrology of Polk County, US Geological Survey, 2007

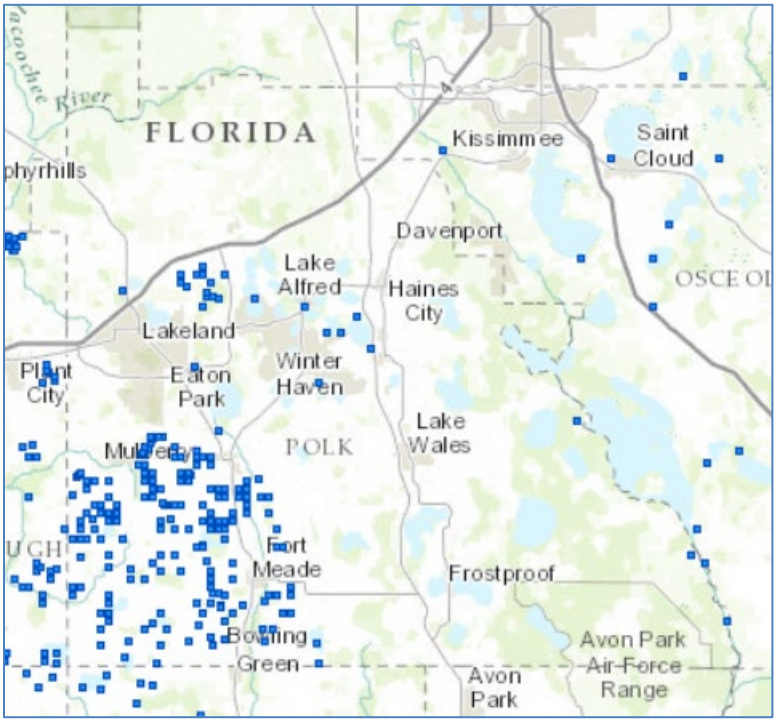


Figure V.39: Polk County dam location map; Source: USACE, National Inventory of Dams
http://nid.usace.army.mil/cm_apex/f?p=838:7:0::NOgeo.usace.army.mil

Historical Occurrences

Since 2010, there have been no recorded instances of dam/levee failure or breach in Polk County. Many dam/levee failures in the past have been related to clay settling ponds and gypsum stacks associated with phosphate mining. Please refer to the section on phosphate mining for a detailed discussion.

Probability of Future Occurrences

Section 62-672 Florida Administrative Code and Section 373, Florida Statutes, govern the construction and safety of dams and levees in Florida. According to FDEP, dam inspections in Florida by: agency personnel at the State, regional, and local levels; and private dam owners. Oversight for phosphate mining and similar industrial impoundments is primarily the responsibility of FDEP. Other dams generally fall within the purview of the U.S. Army Corps of Engineers (USACE), the State's five regional water management districts, or local government agencies.

Based on historical data, the probability that future dam and levee failures will occur somewhere within the planning area is low; however, the LMS cannot exclude such an occurrence. Based on the available information for historical occurrences profiled in this section and the phosphate mining section, the County has experienced a 13 percent annual hazard risk (6 incidents in 47 years). While the risk is very low, the number of dams/levees that are over 50 years of age, and the number of structures ranked as significant or having a high downstream hazard potential, increases the County's risk from very low to low. Most dams categorized as having a high downstream hazard potential are remnant mining ponds that have dried up. Based on the conditions of these structures and the history of dam failures in the County, the County can expect to experience one dam failure every ten years.

The closing of processing plants has raised concerns regarding the maintenance of the phosphogypsum stacks. Of concern is the potential for major or long-duration rainfall events exceeding the capacity of the stack. Per FDEP, upon completion of closure activities, the owner shall take over long-term maintenance responsibilities.

Epidemics

Description and Background

An epidemic is a sudden, widespread occurrence of an undesirable phenomenon. Epidemics frequently refer to infectious diseases, but also include agricultural diseases and exotic pests, and social activities such as drug use.

- Infectious Disease
  Infectious diseases are illnesses caused by the presence and activity of one or more pathogenic agents including viruses, bacteria, fungi, protozoa, multicellular parasites, and abnormal proteins called prions. Transmittal occurs through a variety of means including direct or indirect contact; ingestion (in water or food); transmission of body fluids; inhalation of airborne particles and droplets; transmission by vectors such as mosquitoes, fleas, and ticks; and others.

- Exotic Pests and Diseases
  Citrus production and cattle ranching are two of the major industries in Polk County. In the past, several pests and diseases have threatened both. Eastern equine encephalitis threatened the large animal population (cattle, horses, etc.) in 1992. The Mediterranean fruit fly threatened citrus crops in 1997 and citrus canker threatened citrus in 2005–06. Citrus Greening and black spot diseases continue to impact the citrus industry and spread throughout Polk County. Figure V.40 illustrates the locations in 2017 of citrus greening in relation to commercial citrus production areas.

- Social Activities
  Social activities, such as drug use, can reach epidemic proportions. Prescription narcotic abuse has been a problem in Polk County.

The spread of infectious disease depends on pre-existing levels of the disease, ecological changes resulting from disaster, population displacement, changes in population density, disruption of public utilities, interruption of basic public health services, and compromises to sanitation and hygiene. The risk that epidemics of infectious disease will occur is proportional to the population density and displacement. A true epidemic can occur in susceptible populations in the presence or impending introduction of a disease agent compounded by the presence of a mechanism that facilitates large-scale transmission.

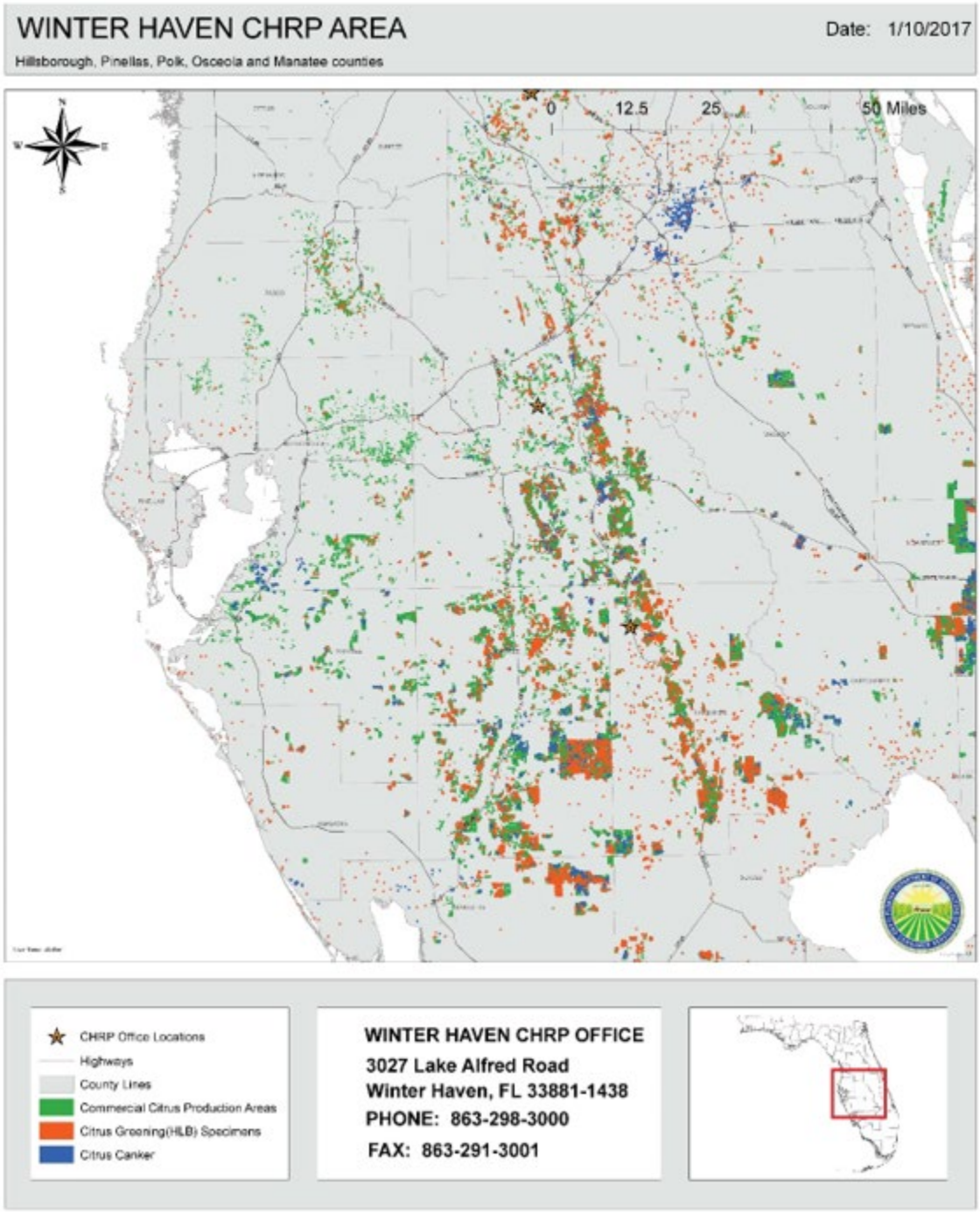


Figure V.40: Citrus greening location map; Source: Citrus Health Response Program (CHRP)

Historical Occurrences

In 2019, a Hepatitis A outbreak impacted Florida more than any other state. Florida had a 1.3 percent fatality rate compared to the national average of 1 percent. More than 40 people died from the virus and 78 percent of the cases in Florida required hospitalization, compared to 60 percent nationally, which led

to an estimate $180 million in hospital costs. Polk County had 39 cases, as of September 2019, and 18 cases in 2018. Polk County is ranked 16th in the State for number of cases.

On January 30, 2020, the Florida Department of Health Polk County extended a rabies alert, originally issued for the Bartow and Loughnan area on November 18, 2019. Polk County had 10 confirmed cases of rabies in the first quarter of 2020; the last involving a 15-year-old Davenport boy bitten by a sick raccoon. There were three confirmed cases in 2018 (Source: The Ledger and Florida Department of Health Polk County).

On March 17, 2020, the Florida Department of Health announced the first positive case of COVID-19 in Polk County. One month later, the County experienced an exponential increase in positive cases including in Lakeland and Winter Haven. As of 10:00 a.m. on May 2, the Florida Department of Health reported the County had 514 cases, 159 hospitalization, and 26 deaths. The County, municipalities, and Polk County Public Schools implemented social distancing measures including closing schools and businesses, holding virtual public meetings, and implementing safer-at-home policies

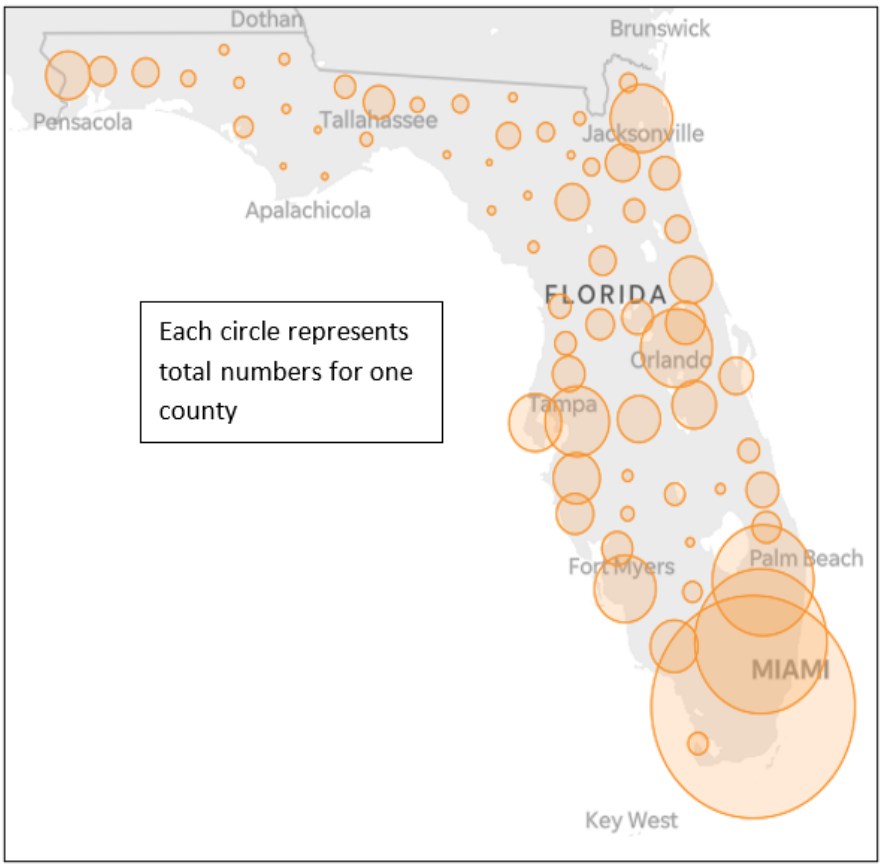


Figure V.41: Corona virus cases in Florida April 27, 2020; Source: The Ledger – Johns Hopkins University; local and state health agencies; USA TODAY research

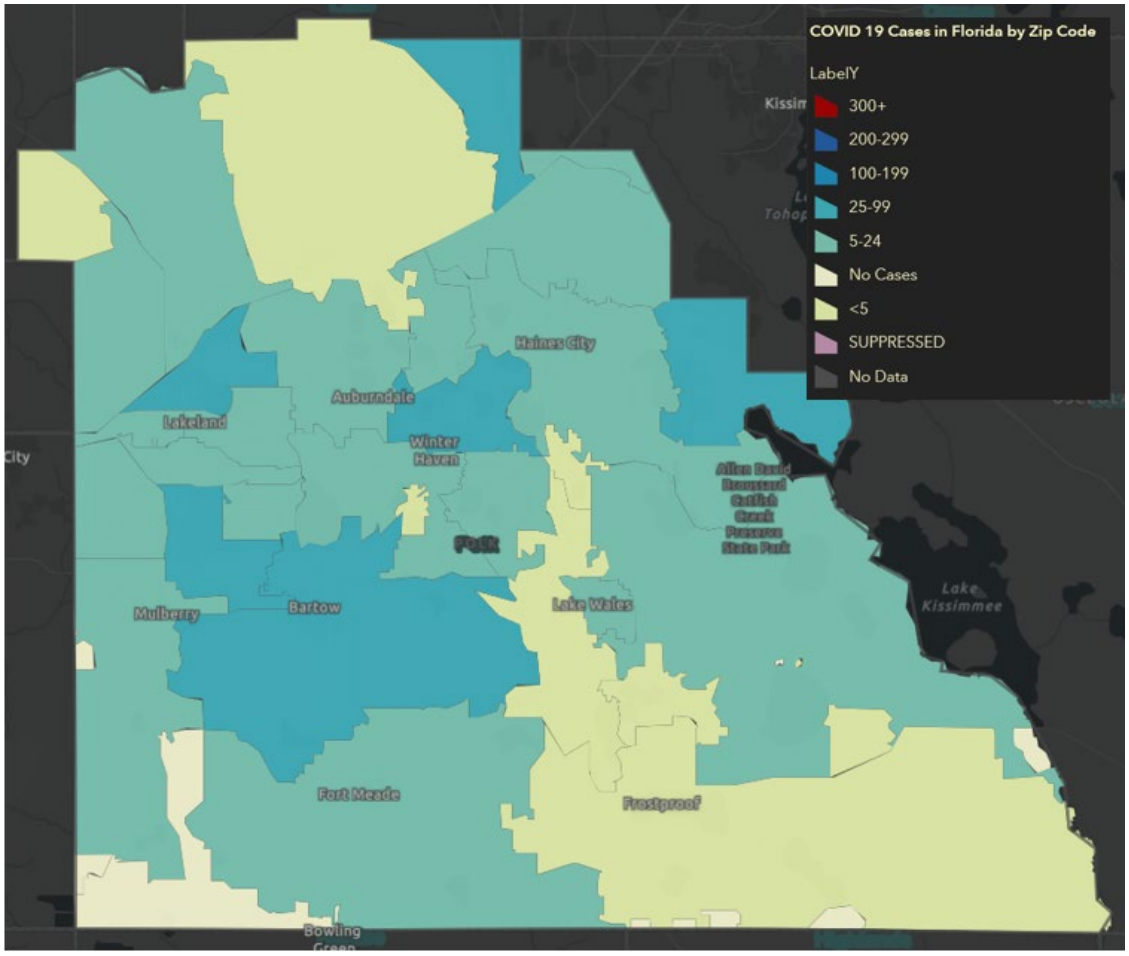


Figure V.42: COVID-19 cases by zip code May 2, 2020; Source: Florida Department of Health, Division of Disease Control and Health Protection https://experience.arcgis.com/experience/96dd742462124fa0b38ddedb9b25e429

According to the Florida Department of Law Enforcement's Drugs Identified in Deceased Persons by Florida Medical Examiners 2017 annual report, prescription drugs (benzodiazepines, carisoprodol/meprobamate, zolpidem, and all opioids, excluding heroin and fentanyl analogs), continued to be found more often than illicit drugs, both as the cause of death and present at death. Not including ethyl alcohol, prescription drugs account for 58 percent of all drug occurrences in this report. People produce fentanyl illicitly, and currently many fentanyl occurrences represent the ingestion of illicit fentanyl rather than pharmaceutically manufactured fentanyl.

Potential Impacts

Epidemics have an overwhelming impact on a population both directly and indirectly. The economic costs encompass hospitalizations, insurance premiums, outpatient visits, and even death. The spread of exotic pests and diseases may cause a change in the local flora/fauna and have impacts on the economy – such as a change in agricultural crops. Social epidemics such as drug use impact social, economic, and political aspects of the community.

Probability of Future Occurrences

According to the University of Florida Institute of Food and Agricultural Sciences extension, some emerging infectious diseases (EIDs) such as AIDS, antibiotic resistant bacteria, tuberculosis, and others are already a threat to Florida and the United States. Others, such as dengue and dengue hemorrhagic fever, pose a credible threat to certain areas of the continental United States such as Florida and Texas, and there have been outbreaks in Hawaii and Puerto Rico. Another group of EIDs may present a hazard to travelers visiting or working in foreign locations where these diseases are endemic. The use of disease organisms such as *Bacillus anthracis* (anthrax), *Francisella tularemia* (tularemia), smallpox and ebola viruses, and others in bioterrorist attacks is now a threat in many countries including the United States.

The probability of future occurrences is even across Polk County. Areas of the County with high concentrations of agricultural production have a higher level of exposure for impacts of citrus greening and other agricultural pests and diseases.

Hazardous Materials Incidents

Description and Background

Hazardous Materials (HazMat) are hazardous substances, petroleum, natural gas, synthetic gas, and acutely toxic chemicals. Title III of the Superfund Amendments and Reauthorization Act of 1986 uses the term Extremely Hazardous Substance (EHS) to refer to those chemicals that may cause serious health effects following short-term exposure from accidental releases.

Small Quantity Generator of Hazardous Waste (SQG) are facilities that generate hazardous waste as a product or byproduct of their normal business function. The District VII Local Emergency Planning Committee (LEPC) inspects these facilities. Classic examples of SQGs include:

- Auto Paint & Body Shops (paints and solvents, anti-freeze);
- Doctor/Dentist offices that use wet read x-rays versus digital (photographic silver);
- Auto mechanic shops (oils, solvents, anti-freeze);
- Pesticide applicators (plastic containers); and
- Florescent light tubes (mercury).

Site termed as 302 sites are facilities that use/consume EHS in the normal process of business. Generally, there will be large amounts of these substances stored on site and used as needed. An EHS is a substance that has the potential to kill or cause serious health issues to a person. Some of the classic examples of EHS include:

- Chemicals for citrus groves (paraquat dichloride, temmic);
- Large battery back-up systems for telephone communications (sulfuric acid & lead);
- Manual blood pressure cuffs (mercury);
- Refrigerants (anhydrous ammonia); and
- Chlorine – vs – Sodium Hypochlorite (used for water purification).

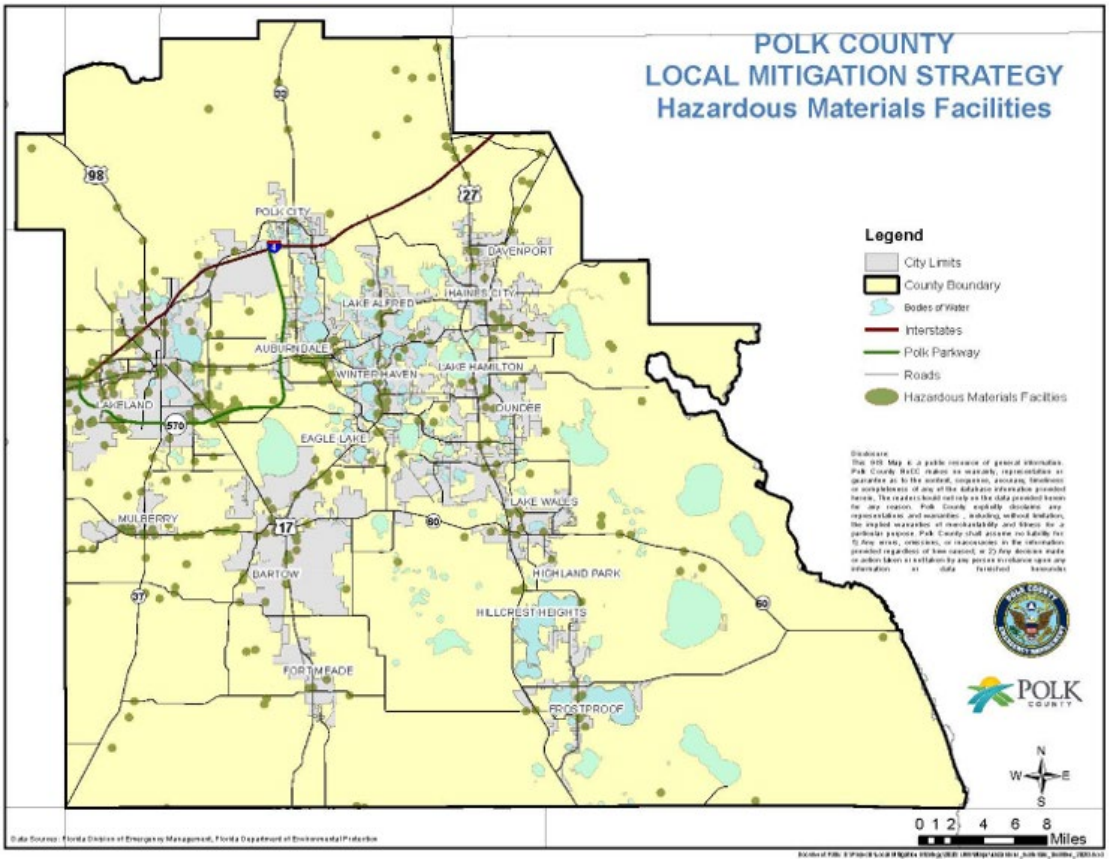


Figure V.43: Hazardous materials facilities; Source: Florida Division of Emergency Management

Since 1989, Polk County has been the had the greatest the number of facilities in Florida which use, store, manufacture, or transport chemicals that EPA has designated as EHSs. The total number of facilities in Polk County varies from year to year due to a variety of factors. Since 1992, the number of facilities required to file EHS reports has ranged between 200 and 350. The potential for incidents involving these substances is high.

Of the numerous hazardous materials incidents reported statewide each year, less than one percent resulted in fatalities, less than four percent resulted in injuries, and less than six percent resulted in evacuation. Hazardous materials incidents can occur anywhere there is a road, rail line, or fixed facility storing hazardous materials. The entire County is a risk to an unpredictable incident of some type. Most incidents are small and confined to a relatively localized area.

The greatest volume of EHS found in Polk County is sulfuric acid. Mining operations and fertilizer production use this substance. The facilities using sulphuric acid in large quantities are concentrated in the southwest section of the County.

TABLE V-18:
AMOUNT OF CHEMICALS BY SITE IN COUNTY

Chemical	EHS	Number of Sites	Total Amount	High	Low	Average
High Sulpher Diesel	No	180	45,401,263	17,074,521	300	252,229.23
Sulphuric Acid	Yes	127	78,584,024	27,110,000	578	618,771.80
Chlorine	Yes	64	667,130	450,000	150	10,580.0
Gasoline	No	61	4,151,870	999,999	186	84,292.95
Ammonia/Anhydrous Ammonia	Yes	45	4,119,836	1,376,000	600	91,551.91
Sodium Hypochlorite	No	42	2,001,682	386,400	200	47,659.10
Lead	Yes	35	2,875,072	664,160	4,060	82,144.91
Propane	No	26	1,816,247	407,040	440	69,885.70
Sodium Hydroxide	No	25	3,168,801	964,000	12,000	126,752.00
Hydrotreated Heavy Paraffinic Petroleum Distallates	No	19	856,766	538,116	1,152	45,092.00

Source: Polk County

Figure V.44: Molten sulfur train derailment, November 27, 2017. Source: www.fluoridealert.org

Hazardous material incidents can occur during production, storage, transportation, use, or disposal. Communities are at risk when companies or individuals use chemicals unsafely or release harmful amounts into the environment. Polk County and jurisdictions participate in the District 7 Local Emergency Planning Committee (LEPC) whose responsibilities include collecting information about hazardous materials in the community, making this information available to the public upon request, and developing an emergency plan to prepare for and respond to chemical emergencies in the community. The LEPC's emergency plan identifies means in which to notify the public, and actions the public must take in the event of a release.

Historical Occurrences

FDEM reported 56 hazardous material incidents in Polk County from 2016 to 2019. Most of the incidents involved anhydrous ammonia (22 percent) or sodium hypochlorite (11 percent) and resulted in the evacuation of 202 people, 11 injuries, and no fatalities. FDEM reported approximately 72 percent of the incidents as toxic and 33 percent involved off-site releases.

August 28, 2016	A Water Loss Incident (WLI) occurred within the West Cell of the Phase II section of the south phosphogypsum stack at its New Wales Fertilizer Manufacturing Facility.
January 11, 2017	A two vehicle accident in Winter Haven caused US 17 to close in both directions. As reported, the accident released between 20 and 25 gallons of chlorine but did not impact storm drains or waterways. Officials reported seven injuries.
September 15, 2017	ACT Environmental reported an industrial fire from a chemical explosion at a Lakeland warehouse. The event was a potential hazmat release since the facility housed toluene. Officials evacuated 50 people from the area, decontaminated 6 employees, and transported 3 men to the hospital with chemical burns to the hands and arms.
April 4, 2019	Two vehicles were involved in a head on collision in the Winter Haven area. An estimated 15 gallons of motor oil and battery acid reported spilled. The spill did not impact any storm drains or waterways. The local fire department reported they would not conduct clean-up of the spill.
December 11, 2019	A release of one gallon of aqua ammonia (19 percent solution) was spilled from a vehicle in Davenport. The release resulted in one injury.

Potential Impacts

There may be significant potential impacts to people and property caused by a major hazardous materials release.

Probability of Future Occurrences

Polk County programs help reduce the amount of hazardous materials and future hazmat occurrences and are listed.

1) Through the Small Quantity Generator Program, the County provides businesses with information about methods of hazardous waste recycling and disposal. The State mandates Polk County monitor all businesses on the handling of hazardous waste.

2) The Household Hazardous Waste Collection Facility accepts, free of charge, any household materials (corrosives, flammable, reactive materials, and toxins) that can cause injury or are harmful to people and the environment, if handled improperly.

3) The County receives approximately 3,000 gallons of latex and oil-based paints and stains annually. A portion of this material is in good, usable condition. In the Paint Giveaway Program, the good paint is free to County residents and is available on a "first come, first served" basis.

4) The Polk County Household Used Sharps Collection Program is a health and public safety program that disposes of over 1.5 million used needles and syringes (sharps) per year. Sharps that people throw away with household garbage place people in danger of injury by puncturing or lacerating skin and spreading disease.

The probability of future occurrences is medium.

Phosphate Mining Industry

Description and Background

FDEP Bureau of Mining and Minerals Regulation (BMMR) categorized approximately 420,000 acres, or 30.6 percent of Polk County, as mineable for phosphate rock. Since the early 1900s, the phosphate mining industry has been second only to agriculture in the economic impact to Polk County. The industry's impact on the economy is, however, in decline and officials anticipate it to continue to decline in the 21st Century as phosphate mining moves south into Hardee and DeSoto Counties. Some chemical manufacturing plants will continue to operate in Polk County and may convert to process new phosphate products. In 2009, Polk County designated approximately 188,000 acres, or 14 percent of the County, as Phosphate Mining, a Future Land Use designation for active mining or industries supporting the phosphate industry. Phosphate mining is a temporary use of the land and the phosphate mining industry has mined most of the phosphate mining district, which is now rural in nature due to reclamation after mining. (Polk County Bone Valley Selected Area Study Existing Conditions Analysis)

Figure V.45: View of a chemical plant. Source: www.fluoridealert.org

Phosphate mining generates waste products during the beneficiation and processing of phosphate rock, including sand tailings and phosphatic clays. Phosphate mining companies use tailings to backfill mine cuts, then spread the overburden stockpiled over the tailings to produce a stable landform with a variety of potential uses. Phosphate mining companies pump phosphatic clays as a 3 to 5 percent solids slurry to

large, diked areas where the clay solids slowly settle, remove the supernatant water through spillways, and reuse them in the mine operations. These clay settling ponds have typically occupied 20 to 40 percent of the land area mined. It takes 3 to 5 years to consolidate to a 15 to 20 percent solids level and to crust over enough to support cattle grazing. (Central Florida Regional Planning Council 1997 Strategic Regional Policy Plan)

Chemical Fertilizer Plants

Open pit mining recovers phosphate rock. The phosphorus content of the phosphate rock is in a form (calcium phosphate) that will not dissolve in water and crops cannot absorb without a chemical process. Large phosphoric acid-based plants complete the chemical processing of phosphate rock (through the wet-phosphoric acid process) to produce phosphoric acid, producing finished products such as di-ammonium phosphate, triple superphosphate, and mono-ammonium phosphate. A primary and significant by-product of the wet process phosphoric acid-based products is phosphogypsum which is largely calcium sulfate.

Figure V.46: View of a phosphogypsum stack. Source: www.fluoridealert.org

Gypsum Stacks

Gypsum stacks are huge piles of stored phosphogypsum. Central Florida is one of the major phosphoric acid producing areas, generating about 32 million tons of phosphogypsum each year (EPA).

Phosphate mining facilities separate the phosphogypsum from the phosphoric acid and store it in the open-air gypsum stacks in the form of a solid/water mixture (slurry). The gypsum stacks form as the phosphate mining companies pump the slurry containing the by-product phosphogypsum onto a disposal site. Over time, the solids in the slurry build up forming a stack. Phosphate mines build gypsum stacks on unused or mined out land on the processing site.

As the gypsum stack increases, the phosphogypsum slurry begins to form a small pond (gypsum pond) on top of the stack. Workers dredge gypsum from the pond to build up the dike around it and the pond

gradually becomes a reservoir for storing and supplying process water. The surface area covered by gypsum stacks ranges from about 5 to 740 acres. The height ranges from about 10 to 200 feet.

Ponds and ditches containing process water cover the tops of operating phosphogypsum stacks. Saturated land masses protrude into the ponds. These surface features may cover up to 75 percent of the top of the stack. Other surface features include areas of loose, dry materials; access roads; and thinly crusted stack sides (EPA).

Historical Occurrences

he Dam/Levee Failure section outlines the historical occurrences of dam/levee failures including clay settling ponds and gypsum stacks, as well as the 1997 breach that occurred in the wall of a gypsum stack in Mulberry maintained by the MPI phosphoric acid/fertilizer production facility. As a result of the breach, approximately 50 million gallons of acidic process water overflowed and ran into and through Skinned Sapling Creek to the Alafia River. Over the course of the next 10 days, the released process water traversed approximately 35 miles of the Alafia River to Tampa Bay. The release lowered the pH of the Alafia River for several days and added large amounts of nutrients to the river system, causing injuries to freshwater wetlands and surface waters, resulting in the deaths of many species of fish, crab, shrimp, oysters, and birds. Several restoration projects occurred in the Alafia River (NOAA).

Another significant event occurred in June 1994 when a sinkhole formed (106 feet wide by 185 feet deep) in the center of an IMC-Agrico gypsum stack (at the now Mosaic New Wales Plan) near Mulberry. The sinkhole photo taken in June 1994 (Figure V.45), released 20.8 million pounds of liquid phosphoric acid into the ground below.

Figure V.47: Sinkhole in Center of IMC-Agrico Waste Stack Near Mulberry, June 1994 Source: www.fluoridealert.org (AP Photo)

The County does not have any available records on historical occurrences of hazardous material incidents relating to phosphate mining. Internet research resulted in the following historical events.

August 2016:	A sinkhole opened underneath a gypsum stack resulting in water, containing low-level radiation and other pollutants, pouring into Florida's primary drinking water aquifer.
October 2019	Two leaks formed in a gypsum stack at a fertilizer plant in Bartow. Officials believe one is coming from the old gypsum stack as the result of a tear in the protective lining. As of January 21, 2020, the nobody has repaired the leaks.

Potential Impacts

The extent of damages the County may suffer will depend on the exact location of gypsum stacks and phosphate mines. Due to their isolated locations, there is little likelihood the failure of a clay-settling pond would adversely impact County residents. Concerns with clay-settling ponds and phosphogypsum stacks center primarily on the potential for contaminated water to flow into water bodies and water supplies and cause subsequent environmental impacts.

Possible effects of the failure of a gypsum stack include surface and groundwater contamination.

Radium is a trace impurity of gypsum. Many parts of the nation have naturally occurring radiation. Some areas of Polk County have higher recordings of radiation.

Probability of Future Occurrences

Although phosphate mining is declining in Polk County, the wet-phosphoric acid process continues at the chemical plants as mine companies transport mined phosphate from other counties into Polk County. A continued probability exists for threats generated by chemical plants and gypsum stacks, especially as they age.

Pipelines

Description and Background

Five pipelines currently traverse Polk County and include the Ammonia Pipeline, the Central Florida Pipeline, the Florida Gas Transmission Company (FTC) Pipeline, the Gulfstream Pipeline, and the Florida Southeast Connection Pipeline. All these pipelines carry hazardous materials. Figure V.46 illustrates the location of the pipelines.

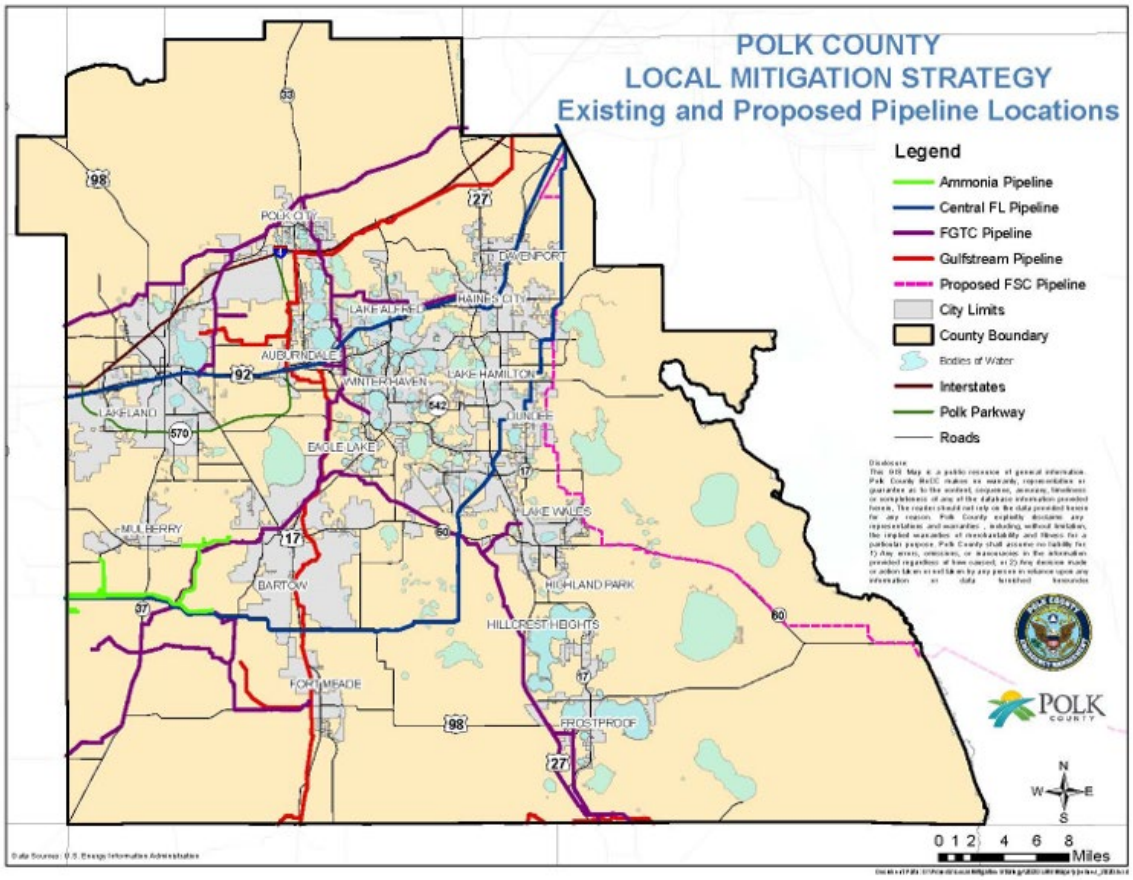


Figure V.48: Pipeline Locations

Historical Occurrences
In July 2019, a pipeline at a phosphate facility leaked approximately 200 gallons of sulfuric acid.

Potential Impacts
Potential impacts from an accident or incident are potentially disastrous.

Probability of Future Occurrences
There is a low probability of future occurrences. Public education regarding pipelines such as "Call before you dig" is important to overall public safety. Many local governments in Polk County disseminate information about pipelines.

Transportation Incidents

Description and Background
The movement of people and materials throughout the County has increased. Accompanying this movement is the increased risk of disaster incidents involving rail, bridges, vehicles, pedestrians, and bicyclists.

Over the last 10 years, pedestrian crashes have injured more than 1,500 people in Polk County. In the same period, traffic crashes have resulted in the deaths of more than 140 pedestrians. The number of

injuries and fatalities due to these crashes is increasing. In 2015 alone, more than 9,600 pedestrian crashes occurred in Florida, with 144 occurring in Polk County. The 2013 Florida Pedestrian and Bicycle Strategic Safety Plan identified Polk County as one of the top ten highest priority counties in the State (Polk County 2040 Long-Range Transportation Plan).

While generally clustered near urbanized areas, many crashes are occurring in less developed parts of Polk County. While most crashes occur during daylight conditions, the majority (63 percent) of severe pedestrian crashes – those resulting in incapacitating or fatal injuries – occur during non-daylight hours. Fully 80 percent of pedestrian fatalities occur during non-daylight conditions. Two types of crashes account for 1/3 of all pedestrian crashes in Polk County: walking along roadway crashes and pedestrian dash/dart out crashes (Polk County 2040 Long-Range Transportation Plan).

Over the last 10 years, bicycle crashes have injured 900 people in Polk County. In the same period, traffic crashed have killed more than 30 bicyclists. In 2014 alone, more than 5,000 bicycle crashes occurred in the state of Florida, with 122 occurring in Polk County. The 2013 Florida Pedestrian and Bicycle Strategic Safety Plan identified Polk County as one of the top ten highest priority counties in the State (Polk County 2040 Long-Range Transportation Plan).

Just like pedestrian crashes, many crashes are occurring in less developed parts of Polk County. Most bicycle crashes (70 percent) occurred during daylight conditions. Moreover, dark-lighted and dark-not lighted conditions generally resulted in a higher percentage of fatal and incapacitating injuries (51 percent). The high percentage of serious and fatal crashes occurring during sub optimal lighting conditions suggests that these crashes are occurring with motor vehicles traveling at higher speeds. Most bicycle crashes occurred where a curb was present. Unpaved shoulder type had the second most bicycle crashes, but had considerably more fatal and incapacitating injuries than the other shoulder types. This large proportion of serious injuries for unpaved shoulders is likely because these roadways are being largely represented in more rural areas with higher travel speeds, whereas curb and gutter is more of an urban feature. Two types of crashes account for 40 percent of all bicycle crashes in Polk County: motorist failed to yield at sign/signal-controlled intersection crashes (23 percent) and motorist overtaking bicyclist crashes (17 percent). This finding makes Polk County unusual, suggesting that more than any other area in the State or country, motorists' behaviors may be most responsible for the plurality of bicycle crashes (Polk County 2040 Long-Range Transportation Plan).

Most rail crossings are in unincorporated Polk County. In the incorporated areas, the rail crossings impact 12 of the 17 municipalities. Of these, Lakeland has the most rail crossings (27 percent), followed by Bartow (14 percent), and Lake Wales (12 percent). CSX moves freight through the County. The Amtrak Silver Star, running from New York to Miami, has stops in Lakeland and Winter Haven. Lakeland's Amtrak train station is located at the northeast corner of downtown along Lake Mirror, east of Massachusetts Avenue. The Winter Haven Amtrak Station is located on 7th Street SW across US 17.

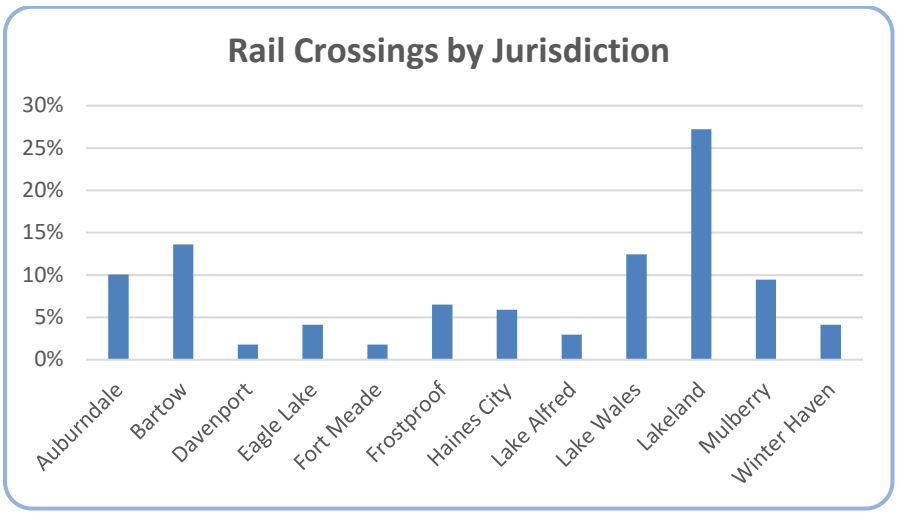


Figure V.49: Rail Crossings by Jurisdictions Source: FDOT

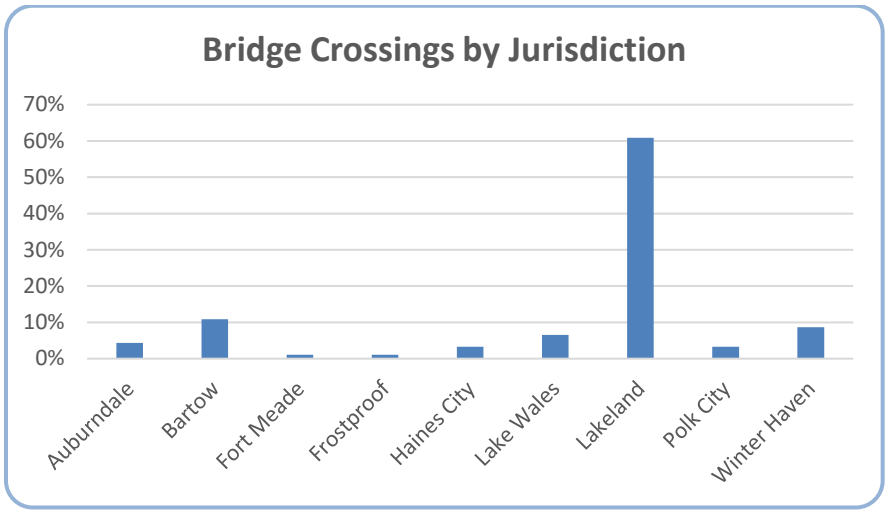


Figure V.50: Bridge Crossings by Jurisdictions Source: FDOT

Historical Occurrences

March 7, 2012 — A CSX Train and a fuel tanker truck collided causing 3,000 gallons of diesel to spill and burn, causing a wildfire. The accident killed the truck driver and authorities closed SR 60 for an extended period. The accident occurred on Mosaic property west of Bartow.

November 27, 2017 — Approximately nine rail cars derailed in the vicinity of a residential area near Lakeland. Four of the train cars were carrying molten sulfur, and 3,000 gallons of that sulfur spilled from one of the cars. Officials closed a portion of Kathleen Road for more than 36 hours.

Table V-19 provides a 9-calendar year history of accidents and incidents for all railroads in Polk County, as provided by the Federal Rail Administration. The maps in Appendix A illustrate the locations of pedestrian injuries and fatalities between 2014 and 2019. They are too numerous to list.

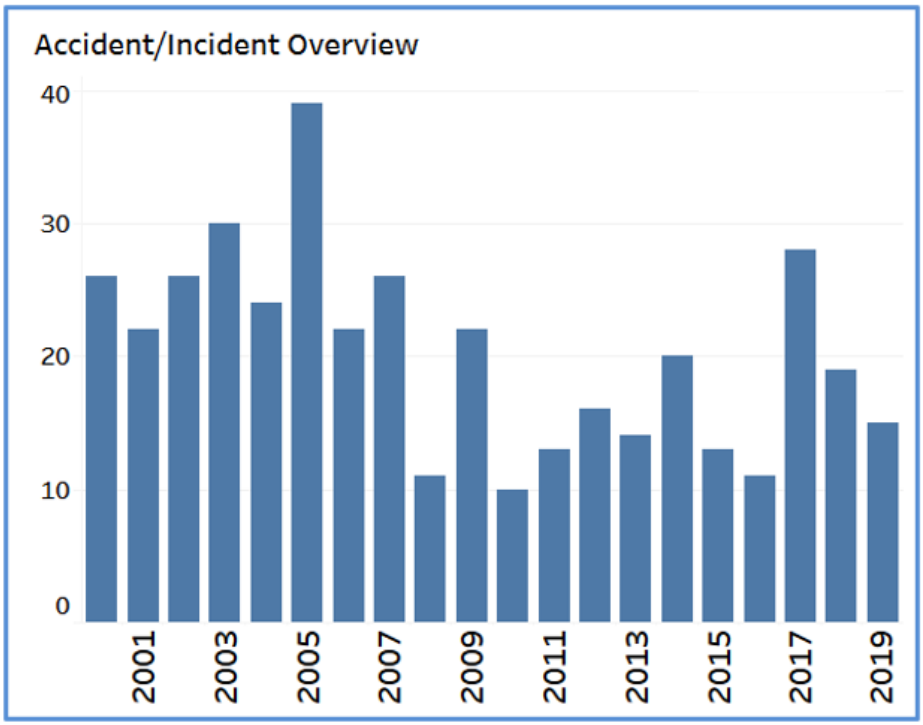


Figure V.51: Railroad Accident/Incident Overview; Source: DOT

TABLE V-19:
9 YEAR ACCIDENT/INCIDENT OVERVIEW BY CALENDAR YEAR (CY) FOR ALL POLK COUNTY RAILROADS

Category	CY '11	CY '12	CY '13	CY '14	CY '15	CY '16	CY '17	CY '18	CY '19	Total
Total Fatalities	1	1	3	1	4	2	5	4	3	24
Total Non-Fatal Conditions	7	9	8	10	10	7	26	14	9	100
Trespasser deaths, not at crossings	1	0	1	1	3	1	3	2	2	14
Trespasser injuries, not at crossings	1	1	0	0	0	2	5	3	1	13
Passengers injured in train accidents	0	1	0	1	0	0	0	0	0	2
Total	13	16	14	20	13	11	28	19	15	149

Source: Federal Rail Administration

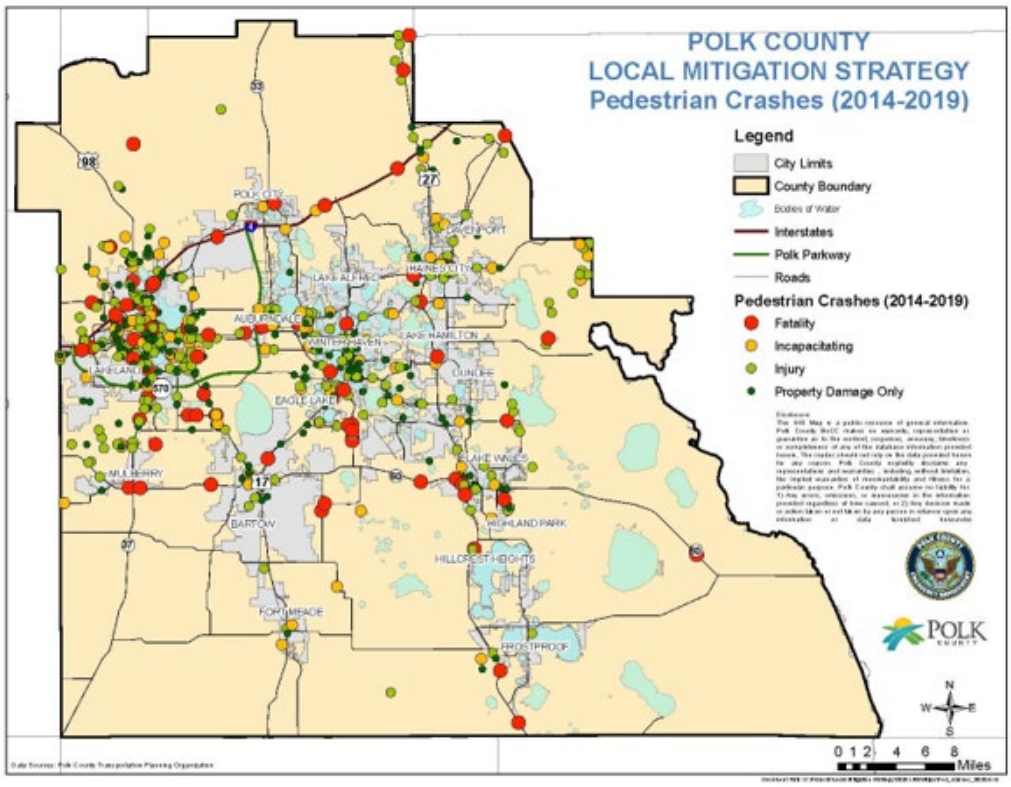


Figure V.52: Pedestrian Crashes (2014-2019); Source: Polk TPO

Potential Impacts

Pedestrian and bicycle accidents may result in serious injury or death. These accidents may cause officials to close roads for periods of time, which may cause a loss of time and/or income for people who utilize the road network. The extent of damages the County may suffer from train accidents depends on the type of train (passenger or freight) and/or its load (i.e. hazardous materials).

Probability of Future Occurrences

The probability of a potential transportation incident is high.

Transportation Safety Conditions

The Polk Transportation Planning Organization published Table V-20 below indicating injuries and fatalities associated with vehicle accidents in 2018.

Figure V.53: CSX phosphate train crash with produce truck, Broadway & Polk St. crossing, Bartow, Florida
Source: www.bestofpolk.com

TABLE V-20:
2018 FATALITIES AND INJURIES ASSOCIATED WITH VEHICLE ACCIDENTS

Performance Measure	Polk County Conditions (2018)
Fatalities	114
Serious Injuries	484
Non-motorized Fatalities and Serious Injuries	70
Rate of Fatalities per 100 Million Vehicle Mile Traveled (VMT)	1.6
Rate of Serious Injuries per 100 Million VMT	7.1

Source: Polk Transportation Planning Organization

SECTION VI –HAZARD VULNERABILITY AND RISK ASSESSMENT

44 Code of Federal Regulations	
44 CFR §201.6(c)(2):	A risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.
44 CFR §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. The plan should describe vulnerability in terms of: (A) The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas; (B) An estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section and a description of the methodology used to prepare the estimate; (C) 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
44 CFR §201.6(c)(2)(iii):	For multi-jurisdictional plans, the risk assessment section must assess each jurisdiction's risks where they vary from the risks facing the entire planning area.

Overview

In preparing the Polk County 2020 Multi-Jurisdictional Local Mitigation Strategy (LMS), the LMS Working Group performed a Hazard Vulnerability and Risk Assessment (Assessment) to determine the impacts that hazards have on built environments and how they affect the safety of residents. The results of the Hazard Identification and Analysis (Section V) indicate hazards that warrant an Assessment due to the frequency of occurrence and resulting damage. The Assessment uses the information generated in the hazard identification, analysis, and hazard profile to identify locations where residents may suffer the greatest injury or property damage in the event of a disaster. The Assessment identifies the effects of hazard events by estimating the relative hazardous condition exposure of people, buildings, and infrastructure. Depending on the data available, an assessment may involve counting the number of structures or people in the path of hazards or describing what hazards may have on physical, social, and economic impacts.

Asset Inventory

Asset identification is a critical step in the hazard mitigation planning process. Taking an inventory of structures and populations provides insight into the County's vulnerability to hazards, and the magnitude of potential damages. Risk assessment models examine the impact of hazards on the built environment, including the general building stock (residential, commercial, industrial, etc.), critical facilities, government operations, shelters, hospitals and health care facilities, utilities, water and wastewater, hazardous material sites, and schools. The LMS Working Group analyzed data from the Florida Division of Emergency Management (FDEM) Geographical Information Systems (GIS) Critical Facilities inventory and local critical facility information to assess vulnerability. FDEM's Critical Facilities inventory includes shelters, health care facilities, schools, emergency services, and infrastructure. In some instances, this information differed slightly from the inventory data reflected from the Polk County Property Appraisers Office.

General Acreage, Building Valuation, and Total Valuation

The LMS Working Group utilized County tax assessment data and 2018 US Census data to develop an inventory of the built environment and population. The LMS Working Group utilized GIS software to estimate the number of acres, structures, and individuals at risk from select hazards for the incorporated and unincorporated areas of Polk County. Department of Revenue (DOR) Use Codes assigned by the Polk County Property Appraiser indicate approximately 53 percent of the lands within incorporated areas of Polk County have a non-residential land DOR classification, 29 percent have an agricultural land DOR classification, and 18 percent have a residential land DOR classification. Polk County Property Appraiser data indicates approximately 48 percent of the lands within unincorporated areas of Polk County have non-residential land DOR classifications, 39 percent have agricultural land DOR classifications, and 13 percent have a residential land DOR classification. While DOR Use Codes identify the majority of the land in incorporated and unincorporated Polk County as non-residential and agricultural, the majority of the building and total valuation is residential (Figures VI.1 through VI.6 and Tables VI-1 and VI.2).

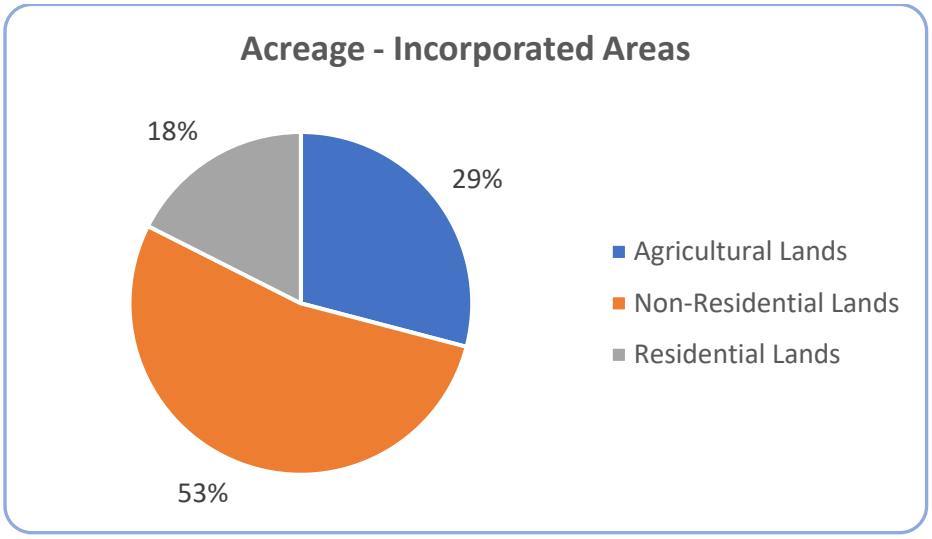


Figure VI.1: Acreage for Incorporated Areas

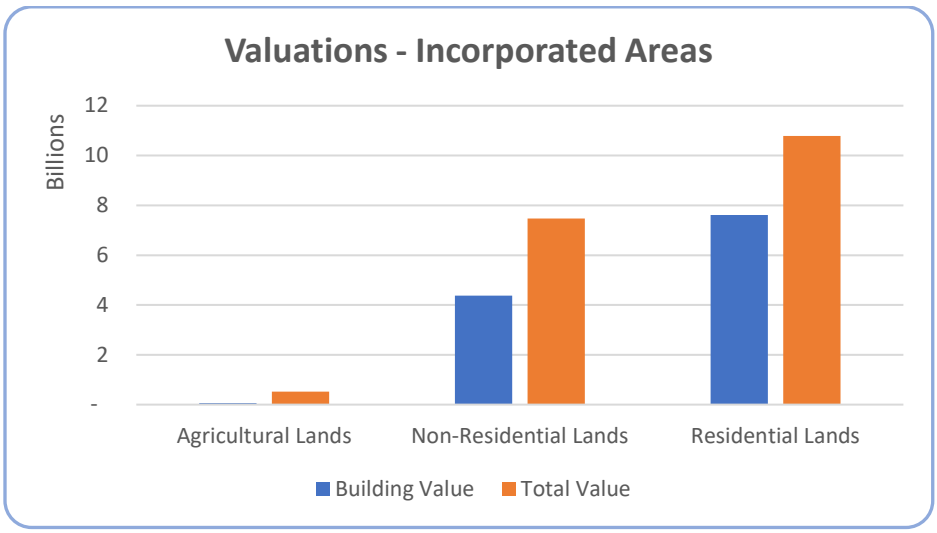


Figure VI.2: Valuations for Incorporated Areas

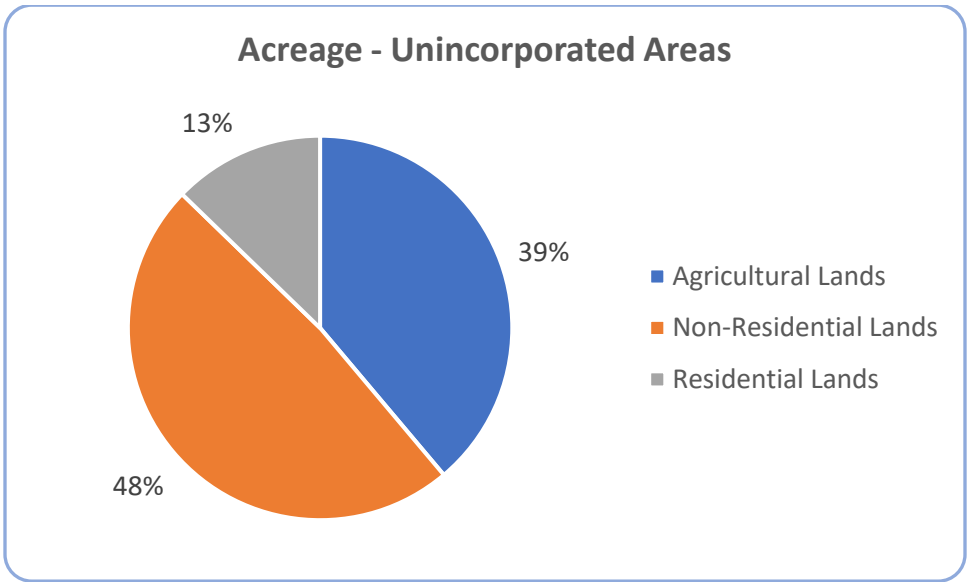


Figure VI.3: Acreage for Unincorporated Areas

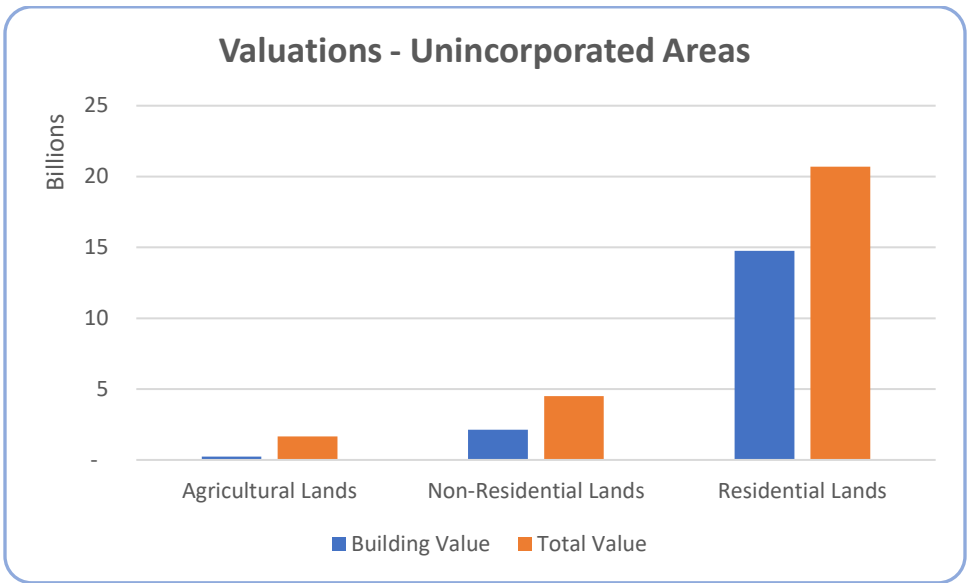


Figure VI.4: Valuations for Unincorporated Areas

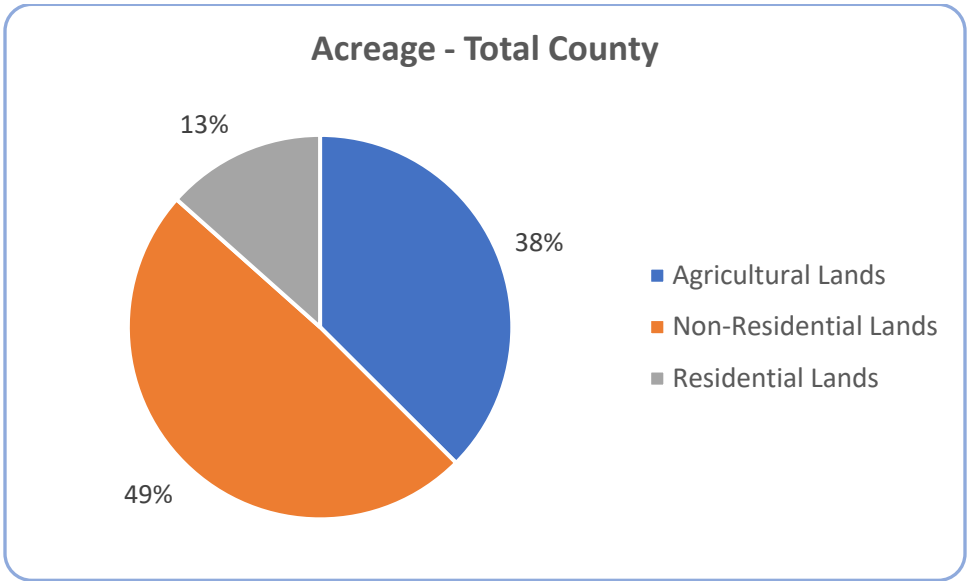


Figure VI.5: Acreage for Total County

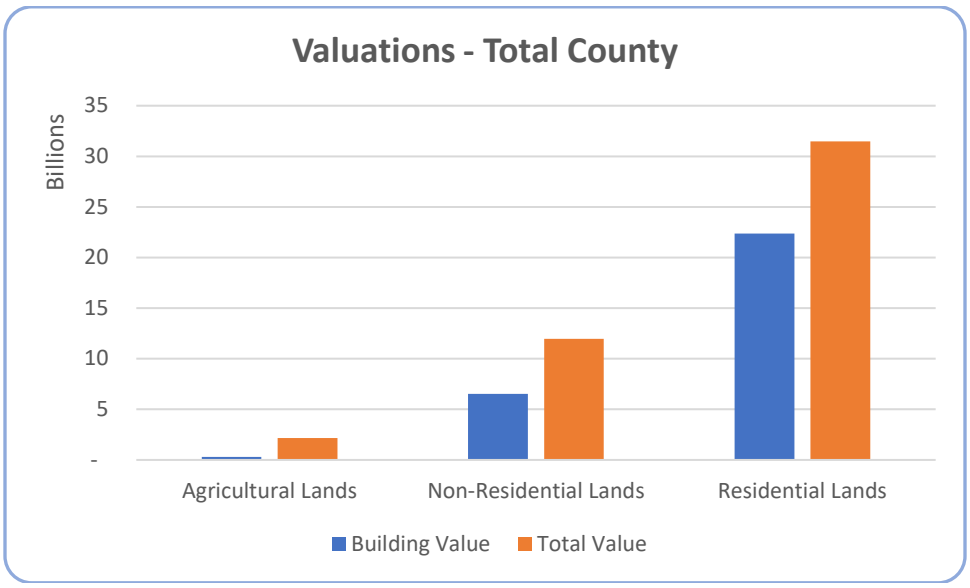


Figure VI.6: Valuations for Total County

Table VI-1 includes the summary of acreage, building value, and total value for the incorporated and unincorporated portions of the County and the County as a whole. Table VI-2 includes these values for each municipality.

TABLE VI-1:
ACREAGE, BUILDING VALUE, AND TOTAL VALUE

Land Type	Acreage	Building Value ($)	Total Value ($)
Incorporated			
Agricultural Lands	50,915	58,139,520	515,695,081
Non-Residential Lands	93,414	4,378,931,149	7,468,055,622
Residential Lands	30,729	7,613,102,413	10,787,411,510
Total Lands	175,057	12,050,173,082	18,771,162,213
Unincorporated			
Agricultural Lands	415,977	226,137,205	1,651,896,395
Non-Residential Lands	518,045	2,140,928,787	4,498,688,144
Residential Lands	136,447	14,749,838,186	20,696,489,602
Total Lands	1,070,470	17,116,904,178	26,847,074,141
Total County			
Agricultural Lands	466,892	284,276,725	2,167,591,476
Non-Residential Lands	611,459	6,519,859,936	11,966,743,766
Residential Lands	167,176	22,362,940,599	31,483,901,112
Total Lands	1,245,527	29,167,077,260	45,618,236,354

Source: Polk County Property Appraiser and Jurisdictions

TABLE VI-2:
VALUATIONS BY MUNICIPALITY

Land Type	Acreage	Building Value ($)	Total Value ($)
Auburndale			
Agricultural Lands	4,137	6,015,408	$32,495,682
Non-Residential Lands	5,999	268,489,230	429,010,164
Residential Lands	2,338	511,980,047	717,425,244
Total Lands	12,474	786,484,685	$1,178,931,090
Bartow			
Agricultural Lands	4,137	1,379,827	50,339,255
Non-Residential Lands	9,968	297,229,898	434,685,172
Residential Lands	2,057	491,485,307	658,884,439
Total Lands	16,162	790,095,032	1,143,908,866
Davenport			
Agricultural Lands	652	453,585	10,575,339
Non-Residential Lands	356	12,673,821	28,483,123
Residential Lands	1,122	258,512,537	351,272,617
Total Lands	2,131	271,639,943	390,331,079
Dundee			
Agricultural Lands	4,382	2,248,493	35,005,560
Non-Residential Lands	1,920	34,751,760	93,123,359
Residential Lands	732	121,333,178	159,269,936
Total Lands	7,034	158,333,431	287,398,855
Eagle Lake			
Agricultural Lands	326	909,367	4,760,548
Non-Residential Lands	1,598	32,155,151	42,179,996
Residential Lands	339	71,399,792	99,380,933
Total Lands	2,263	104,464,310	146,321,477
Fort Meade			
Agricultural Lands	1,064	554,696	3,675,451
Non-Residential Lands	3,320	28,503,343	56,419,044
Residential Lands	853	101,968,550	133,399,721
Total Lands	5,237	131,026,589	193,494,216
Frostproof			
Agricultural Lands	4,666	1,884,258	35,417,033
Non-Residential Lands	6,743	77,959,339	109,066,946

TABLE VI-2:
VALUATIONS BY MUNICIPALITY

Land Type	Acreage	Building Value ($)	Total Value ($)
Residential Lands	538	53,091,103	75,484,378
Total Lands	11,947	132,934,700	219,968,357
Haines City			
Agricultural Lands	5,050	1,570,771	60,392,054
Non-Residential Lands	4,530	273,948,094	528,854,070
Residential Lands	2,959	716,023,672	954,953,749
Total Lands	12,538	991,542,537	1,544,199,873
Highland Park			
Agricultural Lands	0	0	0
Non-Residential Lands	621	38,901	851,959
Residential Lands	93	11,986,266	16,770,244
Total Lands	714	12,025,167	17,622,203
Hillcrest Heights			
Agricultural Lands	0	0	0
Non-Residential Lands	5,448	19,858	57,209
Residential Lands	85	14,791,440	20,505,217
Total Lands	5,533	14,811,298	20,562,426
Lake Alfred			
Agricultural Lands	3,153	1,320,430	15,664,060
Non-Residential Lands	3,718	43,202,432	87,527,908
Residential Lands	1,096	155,302,161	216,321,932
Total Lands	7,968	199,825,023	319,513,900
Lake Hamilton			
Agricultural Lands	1,029	853,746	13,121,207
Non-Residential Lands	988	25,229,440	36,839,857
Residential Lands	395	46,921,384	68,022,957
Total Lands	2,411	73,004,570	117,984,021
Lake Wales			
Agricultural Lands	4,486	2,359,510	16,312,219
Non-Residential Lands	6,379	237,379,607	436,027,785
Residential Lands	1,700	424,203,051	588,133,017
Total Lands	12,565	663,942,168	1,040,473,021
Lakeland			
Agricultural Lands	8,292	14,406,999	133,151,625
Non-Residential Lands	24,969	2,339,503,016	3,891,389,308

TABLE VI-2:
VALUATIONS BY MUNICIPALITY

Land Type	Acreage	Building Value ($)	Total Value ($)
Residential Lands	9,631	3,028,436,987	4,495,444,368
Total Lands	42,893	5,382,347,002	8,519,985,301
Mulberry			
Agricultural Lands	1,974	109,392	10,575,169
Non-Residential Lands	2,368	96,282,962	176,560,294
Residential Lands	268	42,708,922	53,883,058
Total Lands	4,610	139,101,276	241,018,521
Polk City			
Agricultural Lands	1,799	19,725	7,132,294
Non-Residential Lands	738	15,057,864	32,250,713
Residential Lands	683	83,053,851	124,687,024
Total Lands	3,220	$98,131,440	$164,070,031
Winter Haven			
Agricultural Lands	5,767	$24,053,313	$87,077,585
Non-Residential Lands	13,751	$596,506,433	$1,084,728,715
Residential Lands	5,838	$1,479,904,165	$2,053,572,676
Total Lands	25,357	$2,100,463,911	$3,225,378,976

Sources: Polk County Property Appraiser and Municipalities

Critical Facilities

Hazard identification analyses determine which structures, areas, and services are necessary to provide a minimal degree of safety, health, and security to residents of a community. Each community must determine the composition and importance of identified critical facilities. Multiple buildings serving as critical facilities may exist in one location. For example, a school will have classroom buildings, a gymnasium, administrative buildings, etc. The LMS Working Group determined the following are critical facilities:

- Fire stations;
- Governmental buildings;
- Schools/shelters;
- Hospital and health care facilities;
- Utilities; and
- Water and wastewater facilities.

Approximately 57 percent of the critical facilities are located in the unincorporated areas of the County. The cities of Lakeland and Bartow have the most identified critical facilities, with 15 and 10 percent respectively.

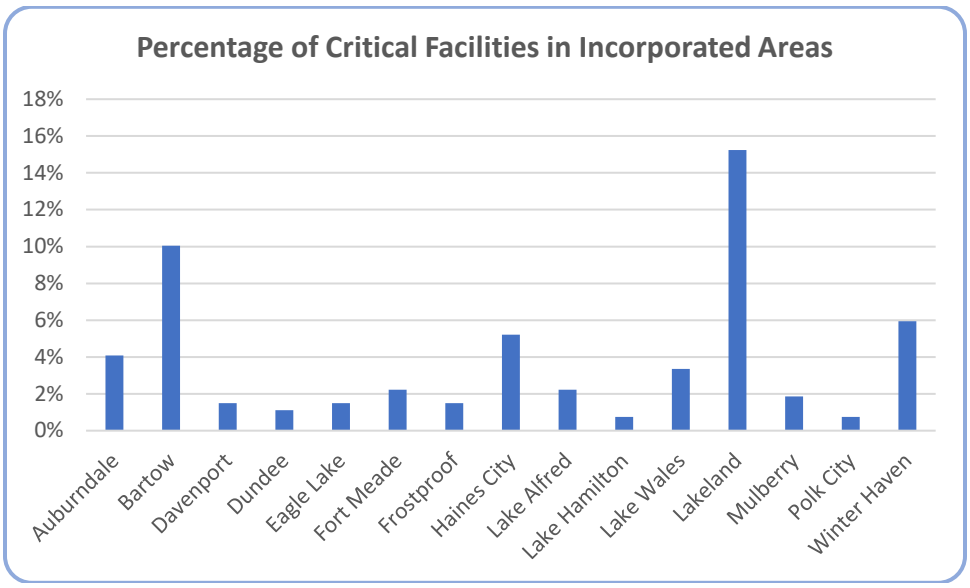


Figure VI.7: Percentage of Critical Facilities in Incorporated Areas

Government Operations

Polk County and its jurisdictions use several facilities, offices, and stations to house and coordinate hazard and emergency response activities. These facilities also provide locations direct operations prior to, during, and after a hazard event. Although many facilities are designed to withstand a variety of hazards, several have not and need additional hardening.

Schools/Shelters

Schools house thousands of children during each weekday, and entire communities use school facilities for educational, recreation, and other activities throughout the year. Emergency events may cause disruption to these activities. If schools are open for following emergency events, parents may focus on home and business cleanup and rebuilding.

School buildings are used as hurricane shelters in Polk County. Emergency plans call for evacuation of affected communities to these shelters in the event of a major storm. As in many other areas in the United States, emergency preparedness officials have expressed concerns about the adequacy of shelters to house evacuated populations. Shelter criteria from the American Red Cross limits the number of existing structures to house people during evacuations. Shelters cannot be in evacuation zones, must be outside the Category 4 storm surge area, and must provide 20 square feet of space per individual. Approved shelters for special needs populations must have 60 square feet of space per individual.

According to the 2020 Statewide Emergency Shelter Plan, Polk County had a deficit of 2,626 general population shelter spaces in 2020 and a projected deficit of 3,175 general population shelter spaces by 2025. Polk County also indicated a deficit of 2,307 special needs shelter spaces in 2020 and a projected deficit of 2,349 special needs shelter spaces in 2025. County estimates that are based on past storm histories and needs project much smaller deficits.

Hospitals and Health Care Facilities

When a large-scale event (such as a hurricane) threatens the County and requires evacuations there may be impacts to County hospitals and other health care facilities. During this scenario, hospitals may be limited in their ability to provide care during or shortly after the event. Should the event cause significant damage, reentry may not occur for any portion of the general population until the hospitals are able to provide care.

After sudden events in which evacuation is not an option, hospitals and other health care facilities will serve as critical facilities for the treatment and care of the injured, as well as providing ongoing care to the remainder of the community. During a flood event, hospitals should expect an influx of residents, including infirm and aged individuals.

Utilities

Electrical and communication utility providers have contingency plans and design equipment to mitigate hazard events but services may still be disrupted. After an event these providers will need to mobilize labor and equipment to restore services. Loss of electrical power may affect fire protection resources and potable water, especially for smaller or individual water utility and electric systems. Such disruptions may impact emergency management officials' ability to predict when displaced populations can safely return to homes and businesses. Communication failures may have an immediate impact on directing crews to fix services, and coordination of emergency management activities.

Water/Wastewater

Potable water supplies in Polk County face a variety of hazards during a flood event. The first is possible contamination of the public utility and private wells that furnish potable water. Another hazard is loss of plant capacity resulting from floodwaters and the ability to properly dispose of sewage. This manifests through submerged sanitary sewers, septic systems, and wastewater treatment facilities. Periods of high saturation, like flood events, may reduce system efficiency. Septic systems submerged by floodwaters may pose health risks through the introduction of pathogenic organisms into the environment. The higher saturation associated with such events may result in septic drain field failures. Freeze events may lead to a drawdown of water as the agricultural industry uses water from wells to protect crops. If users draw enough water out of the aquifer, the water table may fall to a level where residents served by private wells no longer have access to water and well pumps may fail.

Methodology

The maps in Appendix A demonstrate vulnerability or potential effects of hazards for Polk County and municipalities. The maps identify structures for each hazard, and include municipal boundaries. While the impacts apply to the entire planning area, the analysis includes specific information for municipalities when available. The building and total valuations in Tables VI-1 and VI-2 serve as the basis for the potential estimated dollar losses. These numbers change based on the identified potential hazard impact areas, as applicable and the narrative for each identified hazard includes a summary by municipality.

SECTION VI: HAZARD VULNERABILITY AND RISK ASSESSMENT

Hazard Vulnerability and Risk Modeling

Estimating hazard vulnerability across a large area like Polk County involves many variables, including the type, severity, and geographic spread of hazard events, historical hazard occurrences, number, type, and value of potentially affected properties, affected individuals, and topography.

Describing vulnerability and risk in terms of potential dollar losses provides the community and the State with a common framework to measure the effects of hazards on assets. However, the estimated dollar losses obtained through this process are approximations and should not be used for purposes other than mitigation planning. Damage estimates use the methodology based on the Federal Emergency Management Agency's (FEMA's) Understanding Your Risks: Identifying Hazards and Estimating Losses (FEMA 386-2). The result is an estimate of the potential hazard losses that may occur due to an event impacting the County and causing damage.

Earlier editions of the LMS have used a variety of results from different models to estimate vulnerability to hazards. The summary below addresses these modeling efforts and their results.

TAOS Model

The Arbiter of Storms (TAOS) is a computer model used to produce a detailed risk analysis in a GIS environment. In previous LMS updates and reports, TAOS data was the primary data source used to assess vulnerability to natural hazards. Most hazard profiles and natural hazard vulnerability analyses incorporate more recent MEMPHIS data. Where appropriate, TAOS models have been employed to assess vulnerability not captured by the MEMPHIS analysis.

TAOS generates monetary damage estimates based on varying storm intensities and values of structures located on specified parcels, as indicated within the Property Appraiser's database. Some parameters employed by the model include wind speed, water depth, wave height, and construction material. Land uses are divided into categories such as single-family, multi-family, hotels, industrial, etc., while structures are classified as residential wood frame, mobile home, and commercial per Polk County tax rolls.

MEMPHIS

The Florida Department of Community Affairs (FDCA) previously provided local government GIS data analysis and Mapping for Emergency Management and Parallel Hazard Information System (MEMPHIS) outputs developed by The Kinetic Analysis Corporation. The MEMPHIS model was the original method employed to assess vulnerability to natural hazards. The creators of MEMPHIS derived the data from the analysis of US Census Bureau data, Florida DOR data, and other information related to local conditions, such as historical hazard occurrences and topography, to inventory the total number of structures and critical facilities potentially vulnerable to identified hazards.

The TAOS data generated relevant hazard information such as wind and water levels that the LMS Working Group incorporated into the MEMPHIS modeling system. These data sources present population at risk, and housing and damage estimates for assessing vulnerability. The analysis applied the percent loss for hurricane and flood hazards to Polk County Property Appraiser data and used to determine a more accurate estimate of dollar losses for those hazards.

ELVIS

The Economic Loss Vulnerability Index System (ELVIS) uses loss costs to allow communities to compare the relative risk of various natural hazards. A loss cost is the long-term average of the damage the hazard causes, which is expressed in terms of loss per $1,000 of exposure per year.

Like MEMPHIS, the basis for ELVIS data includes analyses of U.S. Census Bureau data, Florida data, DOR data, and other information related to local conditions (historical hazard occurrences, topography, etc.). The 2010 edition of the LMS used these data sources to present populations at risk, housing, and damage estimates for assessing vulnerability to natural hazards.

HAZUS

FEMA's Hazards United States (HAZUS) software is a nationally standardized GIS-based software package that contains models for estimating potential physical, economic, and social losses from earthquakes, floods, and hurricanes. It graphically illustrates the limits of identified high-risk locations due to earthquakes, hurricanes, and floods. Users can visualize the spatial relationships between populations and other more permanently fixed geographic assets or resources for the specific hazard being modeled, which is a crucial function in the pre-disaster planning process.

The LMS Working Group utilized HAZUS to model and generate estimated potential losses for hurricane winds and flooding. The model used 2000 US Census data to determine vulnerable population concentrations. HAZUS-MH 2.0 is FEMA's standardized loss estimation methodology built upon an integrated GIS platform to conduct analysis at a regional level (i.e., not on a structure by-structure basis). The HAZUS-MH 2.0 risk assessment methodology uses hazard and inventory parameters (e.g., wind speed and building types) to determine the impact (i.e., damages and losses) on the built environment.

As of this time, HAZUS-MH 2.2 is available for download from FEMA. The 2.2 release makes HAZUS compatible with ArcGIS 10.2.2 and Windows 8. Later in the HAZUS modernization process, new functional enhancements will be implemented in the flood module and the underlying code of HAZUS will be re-architected to align with current practices.

Disclaimer

These modeling software applications are loss estimation tools for planning purposes only. Uncertainties are inherent in any loss estimation methodology and arise in part from incomplete scientific knowledge concerning natural hazards and their effects on the built environment. Uncertainties also result from approximations and simplifications necessary to conduct such a study including: incomplete or outdated data on inventory, demographic, or economic variables or parameters; the unique nature and severity of each hazard when it occurs; and the amount of advance notice that residents have to prepare for the incident. As a result, potential exposure and loss estimates are approximations and should not be interpreted or used as precise results; they should only be used to understand relative risk.

Each of the models has advantages and disadvantages and degree of usefulness. The LMS utilizes data and analysis results from different modeling efforts where available and appropriate.

Vulnerability and Risk Assessment

Risk estimate is based on the judgment of local planners and the LMS Working Group regarding the likely frequency of occurrence of a hazard event compared to its probable consequences or impacts. If a hazard

event occurs frequently, and has very high consequences, that hazard poses a very high risk to the affected community. In comparison, if a hazard event is not expected to occur frequently, and even if it did, the consequences would be minimal, then the hazard is considered to pose a very low risk. The hazard vulnerability risk level for the LMS follows the approach utilized in the 2018 Florida Enhanced State Hazard Mitigation Plan.

- Low (One Occurrence every 10 years)
- Medium (One occurrence every 5-7 years)
- Medium/High (One occurrence every 3 years)
- High (One or more occurrence each year

As described in Section V, the following hazards are determined to be minimal to low risk/impact/severity to Polk County, its municipalities, and partners. The LMS does not include any further evaluation in relation to vulnerability and consequences to people, property, critical infrastructure, environment, economy, and response operations.

- Winter storms
- Earthquakes
- Landslides
- Tsunamis
- Coastal and riverine erosion
- Storm surge
- Sea level rise
- Mass immigration/migration

The LMS Working Group identified hazards with medium to high risk in relation to potential frequency and consequences of impact to Polk County and its jurisdictions. They include:

- Extreme temperatures
- Fog
- Hurricanes/tropical storms
- Severe storms and tornadoes, including
  - Hail
  - Lightning
  - Thunderstorms
- Subsidence and sinkholes
- Drought
- Flood
- Climate change
- Wildfire
- Civil disturbance/terrorism
- Cyber-Attacks
- Dam/levee failure
- Epidemics
- Hazardous material incidents
- Transportation incidents

Because these hazards have at least a medium risk in relation to frequency and consequences, the LMS includes them in the vulnerability analysis. Additional information on these hazards includes: geographic areas; degree of severity or magnitude; comparison of jurisdictional risk; and existing and future structures and critical facilities. Due to similar linkages, the vulnerability assessment combines some of the hazards listed above.

TABLE VI-3:
RELATIVE VULNERABILITY TO HAZARDS BY LOCAL JURISDICTION

Hazard	Auburndale	Bartow	Davenport	Dundee	Eagle Lake	Fort Meade	Frostproof	Haines City	Highland Park	Hillcrest Heights	Lake Alfred	Lake Hamilton	Lake Wales	Lakeland	Mulberry	Polk City	Winter Haven	Unincorporated County	Polk Public Schools
Atmospheric Hazards																			
Extreme Temperatures	L/M	M	L/M	M	L/M	M	M	L/M	L/M	M	L/M	M	L/M	M	M	L/M	M	L/M	L/M
Fog	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Hurricanes/ Tropical Storms	L/M	M	L/M	M	L/M	M	M	L/M	L/M	M	L/M	M	L/M	M	M	L/M	M	L/M	L/M
Severe Storms and Tornadoes (Hail, Lightning, and Thunderstorms)	M/H	H	M/H	H	M/H	H	H	M/H	M/H	H	M/H	H	M/H	H	H	L/M	H	H	H
Geologic Hazards																			
Subsidence and Sinkholes	M/H	H	M/H	H	M/H	H	H	M/H	M/H	H	M/H	H	M/H	H	H	M/H	H	M/H	M/H
Hydrologic Hazards																			
Drought	L/M	L/M	L/M	L/M	L/M	L/M	L/M	L/M	L/M	L/M	L/M	L/M	L/M	L/M	L/M	L/M	L/M	L/M	L/M
Flood	L	L/M	L	L	L/M	L/M	L	L	L	L	L/M	L/M	L/M	L/M	L	L	L	M	M
Other Natural Hazards																			
Climate Change	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Wildfire	L/M	M/H	L/M	M/H	L/M	L/M	L/M	L/M	M/H	M/H	L/M	L/M	L/M	L/M	L/M	M/H	L/M	L/M	L/M
Human-Caused Hazards																			
Cyber-Attacks and Terrorism	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Dam/Levee Failure	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Epidemics	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Hazardous Materials Incidents	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Transportation Incidents	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H

* L = Low; M = Medium; M/H = Medium/High; H = High; U = Undetermined due to Lack of Data

Atmospheric Hazard Vulnerability and Risk

Extreme Temperatures

Extent

A heat wave is as an abnormally high temperature and unusually high humidity sustained over a period of at least one day. In Polk County, these temperatures can range above 90°F. Heat waves in Florida typically occur during periods of drought, low humidity, and mostly clear skies. In June 1985, a severe heat wave hit the State with temperatures of 105˚F in Lakeland.

The lowest temperature in Polk County was 18˚F in Avon Park in 1981. According to the Department of Agriculture and Consumer Services (DOACS), Polk County can expect a moderate freeze every one to two years and a severe freeze on an average of once every 15 to 20 years. Temperatures in the 20˚Fs can last for as long as six to eight hours from December to March, causing hard freezes.

The lowest and highest temperatures in the County may range from 15˚F to 105˚F. The heat index may reach 115˚F and the wind chill may be as low as 0˚F.

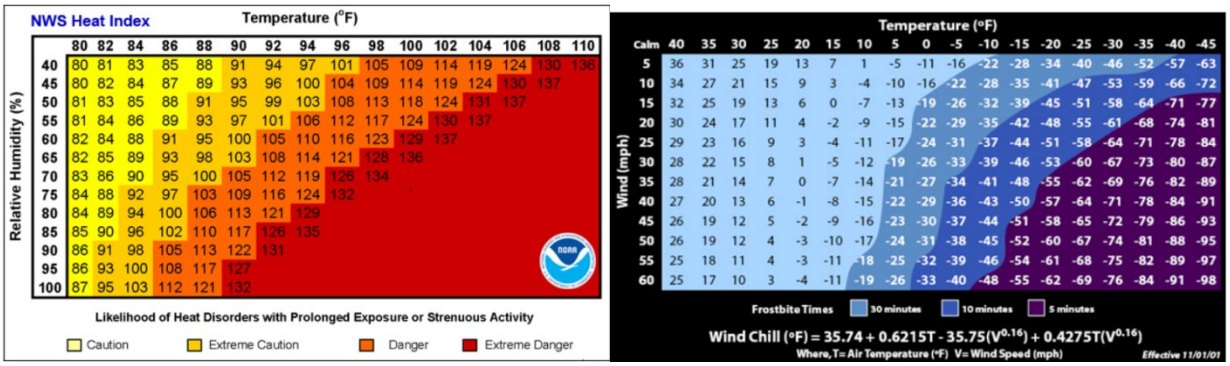


Figure VI.8: Heat Index and Wind Chill Index;
Sources: NWS.NOAA.gov and Floridadisaster.org

Vulnerability Summary

Vulnerability to extreme temperatures is low to medium and all jurisdictions are at risk. The County's very young, elderly, and homeless populations are at the highest risk for injury or death from extreme heat or cold.

With its location in Central Florida, Polk County is susceptible to periods of extreme heat. In addition to deaths, extreme heat events cause a wide range of other health problems such as rashes, cramps, heat exhaustion, and heat stroke. Extreme heat can also make existing medical conditions worse.

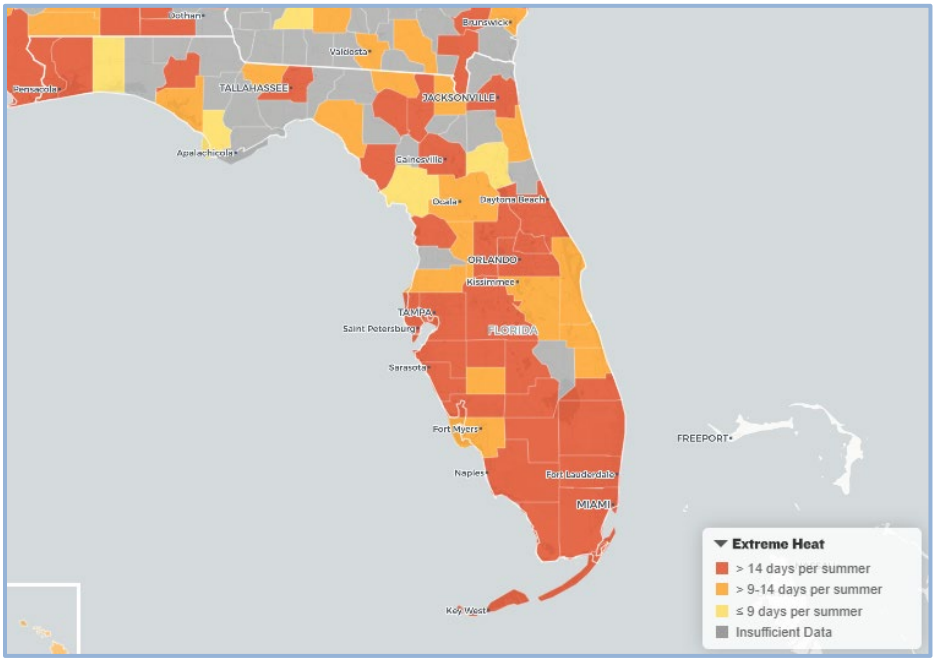


Figure VI.9: Extreme Heat Map ; Source: *NRDC.org*

Higher electrical demand during extreme temperatures often causes power outages that further exacerbates the impact of the event. Extended periods of extreme temperatures can also have a negative impact on wildlife and fishery habitats. If water levels drop to where authorities expand water restrictions, agriculture is vulnerable.

Polk County works with the American Red Cross to open shelters in times of extreme temperatures. In a recent study conducted by the Florida Council on Homelessness, Polk County recorded 512 homeless residents. In past years the number has been as high as 1,100. Polk County Public Schools noted 3,581 students are homeless, with 8 percent are living in shelters.

The extent of severe cold and freeze damage is greatest where farms and groves are located; therefore, the agriculture industry is at risk. According to the Polk County Farm Bureau, Polk County consists of 2,415 farms totaling 520,899 acres that produce an average of $350 million in crops and $34.2 million in livestock annually. The citrus industry in Polk County includes 146,007 acres of land and is ranked as one of the top three crops in the State and top five in the country, depending on the type of citrus. The citrus crop is most vulnerable to freeze.

TABLE VI-4:
LEVEL OF RISK – EXTREME TEMPERATURES

Jurisdiction	Level of Risk
Auburndale	Low - Medium
Bartow	Medium
Davenport	Low – Medium
Dundee	Medium

TABLE VI-4:
LEVEL OF RISK – EXTREME TEMPERATURES

Jurisdiction	Level of Risk
Eagle Lake	Low – Medium
Fort Meade	Medium
Frostproof	Medium
Haines City	Low – Medium
Highland Park	Low – Medium
Hillcrest Heights	Medium
Lake Alfred	Low – Medium
Lake Hamilton	Medium
Lake Wales	Low – Medium
Lakeland	Medium
Mulberry	Medium
Polk City	Low – Medium
Winter Haven	Medium
Unincorporated Polk County	Low – Medium
Polk County Public Schools	Low – Medium

Risk Assessment

Polk County's population of elderly and homeless individuals are especially at risk to the impacts of extreme temperature events. Based on current census data, 20.3 percent of Polk County's population is 65 years of age or older.

Extreme temperatures, especially freezes, pose a recurring major hazard to the agriculture industry in Polk County, and are a significant threat to the economic vitality of the County's agriculture industry. For growers, the impact can vary from low to moderate. A major freeze that causes the loss of an entire year's crops may cause more than $3.2 million in damages. It is highly unlikely that this worst-case scenario would occur. In recent years, freezes have impacted citrus very little. New hybrid plants and growing techniques have limited the impact of freezes. A more likely event would impact 5 to 10 percent of crop production and cause $160,000 to $320,000 in losses. Structures are not vulnerable to the effects of extreme temperatures; therefore, they do not have a potential dollar loss.

Fog

Extent

Dense fog advisories are issued in Polk County every year. Foggy conditions on roadways can cause accidents due to low visibility and the impact on a driver's perception of speed and distance. Polk County can expect approximately 25 days with dense fog (visibility ¼ mile or less) and approximately 125 days with fog (visibility ½ mile to 6 miles). Foggy conditions can lead to chain-reaction accidents. On January 9,

2008, a mixture of fog and smoke from a prescribed burn covered portions of Interstate 4. This caused 70 cars and trucks to collide near mile marker 47, resulting in five deaths and 38 injuries.

Vulnerability Summary

All of Polk County is at risk for incidents related to foggy conditions. The vulnerability of these incidents increases with the number of roads and railroads. The Rail Lines and Crossings Map (Appendix A) illustrates the locations of railroad crossings. The roadway corridors that most frequently experience fog within Polk County are included below. The Interstate 4 corridor carries the most traffic and has experienced the most accidents. This is due in part to the corridor's location through the Green Swamp.

Historically, the densest fog in Polk County has developed along roadways located through pastures and fields, and along water bodies and swamp areas. The roadways listed below are most susceptible to fog conditions in Polk County.

- Interstate 4 from the Hillsborough/Polk County Line to the west, to the Polk/Osceola County Line to the northeast
    - Jurisdictions along this Interstate corridor include:
        - Unincorporated Polk County;
        - Lakeland;
        - Polk City; and
        - Auburndale.

- US 27 from the Highlands/Polk County Line to the Polk/Lake County Line
    - Jurisdictions located along this highway through Polk County include:
        - Unincorporated Polk County;
        - Frostproof;
        - Lake Wales;
        - Dundee;
        - Lake Hamilton;
        - Davenport; and
        - Haines City.
        - Crossing at US 27 south of CR 630.

- US 98 from Interstate 4 to the Polk/Pasco County Line
    - This segment of US 98 traverses the sparsely populated and sparsely developed Green Swamp. This area is vulnerable to fog. Jurisdictions impacted by this roadway segment include:
        - Unincorporated Polk County; and
        - Lakeland.

- US 17 from CR 547 to the Polk/Osceola County Line
    - Jurisdictions impacted by this roadway segment include:
        - Unincorporated Polk County; and
        - Davenport.

- SR 60 from Hillsborough/Polk County Line to the west to the Polk/Osceola County Line to the east
    - Jurisdictions located along this State Road corridor include:
        - Unincorporated Polk County;

        - Mulberry;
        - Bartow;
        - Winter Haven; and
        - Lake Wales.
    - The sections along this corridor that are most vulnerable to fog include much of the undeveloped lands that consist of pasture, row crops, lakes, and wetlands. These areas are located between the Hillsborough/Polk County Line and Mulberry, between the urbanized Mulberry area and Bartow, and between Bartow and the urbanized area of Lake Wales. Fog is also prevalent between Lake Wales and the Polk/Osceola County Line.

- SR 33 from Polk City to the Polk/Lake County Line
    - This segment of SR 33 traverses the sparsely populated and sparsely developed Green Swamp. This is area is vulnerable to fog. Jurisdictions impacted by this roadway segment include:
        - Unincorporated Polk County; and
        - Polk City.

- County Line Road from SR 60 to Interstate 4
    - Jurisdictions along this corridor include:
        - Unincorporated Polk County; and
        - Lakeland.
    - The entire stretch of this roadway is vulnerable to fog.
    - There is one railroad crossing along this corridor that experiences fog coverage.
        - Crossing at US 92 and County Line Road.

Risk Assessment

While the LMS Working Group recognizes jurisdictions are vulnerable to fog incidents, there is a lack of data to quantify the vulnerability of structures to this hazard.

Hurricanes/Tropical Storms

Extent

Several hurricane and tropical storm events occurred in 2004 when three hurricanes directly impacted Polk County, and one indirectly impacted the County. Hurricane Charley made landfall on August 13, 2004; Hurricane Frances on September 5, 2004; Hurricane Ivan on September 16, 2004; and Hurricane Jeanne on September 26, 2004.

Vulnerability Summary

Polk County's location in Central Florida makes it vulnerable to hurricane impacts including property and utility damage from high winds and rain-induced flooding. Older buildings, dilapidated housing, and other less hardened properties, such as mobile homes are most susceptible to damage. As of July 19, 2019, Polk County had 386 licensed mobile home parks with a total of 35,312 spaces, and 84 recreational vehicle camps with 12,579 recreational vehicle spaces (Floridahealth.gov). Widespread electrical outages are likely, as are water and sewage backup in flooded areas. Depending on the intensity of a hurricane, economic impacts can be severe. Hurricane and tropical storm events may impact all populations, but those at highest risk are the elderly, the disabled, lower income, and the homeless. Hurricanes can also cause extensive environmental damage.

As the population increases, ensuring that Polk County has enough shelter space to provide for its residents and evacuees of surrounding areas is a priority. In addition to existing shelters, Polk County continues to assess viable shelter space within the County. The protection of critical infrastructure, communication systems, and power sources is important to recovery after a hurricane/tropical storm event. Polk County and the jurisdictions should continue to ensure that private and public sector facilities meet existing building codes to withstand the impacts of hurricanes.

All of Polk County is vulnerable to high winds during hurricanes and tropical storms. The greatest danger from winds is to those living in structurally unsound housing and mobile homes. Encouraging residents and business owners to protect their homes and facilities with storm shutters and generators will reduce the damage caused by tropical cyclones.

High winds can create significant quantities of debris from downed trees, branches, and damaged buildings. This debris can impede emergency response efforts, present a safety hazard for emergency and repair workers and citizens, and present significant removal, storage, and disposal issues.

All jurisdictions have an equal risk to hurricane impacts. Recent history indicates that residents can expect a hurricane to affect Polk County every two to three years, and the most likely event will be a Category 3 or lesser storm. The probability of being affected by a hurricane is low to medium.

Risk Assessment

The 2018 Florida Enhanced State Hazard Mitigation Plan analyzed the impacts that hurricane winds can have on counties based on return periods and hurricane storm category as shown in Tables VI-5 and VI-6.

TABLE VI-5:
TOTAL ECONOMIC VALUE FOR BUILDINGS BY STORM CATEGORY AND RETURN PERIODS

Return Period	Tropical Storm	Category 1	Category 2	Category 3	Category 4	Category 5
10-Year	$36,235,711,900	$1,288,417,117				
20-Year		$37,524,129,017				
50-Year			$37,524,129,017			
100-Year			$37,232,486,793	$291,642,224		
200-Year				$37,524,129,017		
500-Year			$37,524,129,017			
1,000-Year			$32,875,956,315	$4,648,172,702		

Source 2018 Florida Enhanced State Hazard Mitigation Plan

TABLE VI-6:
TOTAL ECONOMIC VALUE AND DIRECT ECONOMIC LOSSES FOR BUILDINGS BY RETURN PERIODS

Hurricane Wind Return Periods	Direct Economic Loss for Buildings
10-Year	$71,199,639
20-Year	$292,669,436
50-Year	$978,055,150
100-Year	$2,118,283,925
200-Year	$4,110,265,761
500-Year	$7,980,407,286
1,000-Year	$11,740,937,926

Source 2018 Florida State Enhanced Hazard Mitigation Plan

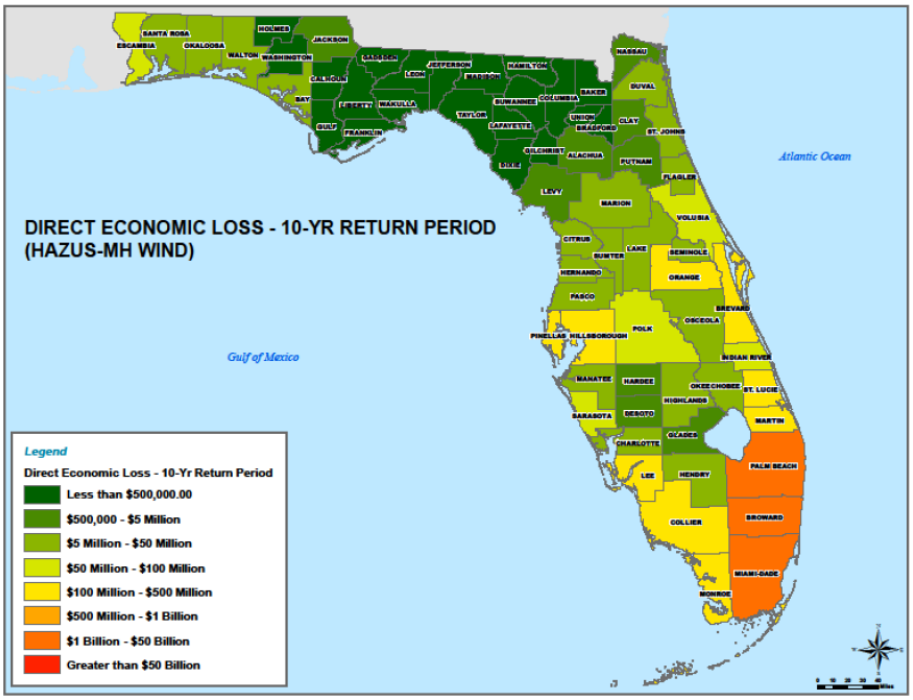


Figure VI.10: Direct Economic Loss – 10-Year Return;
Source: *2018 Florida State Enhanced Hazard Mitigation Plan*

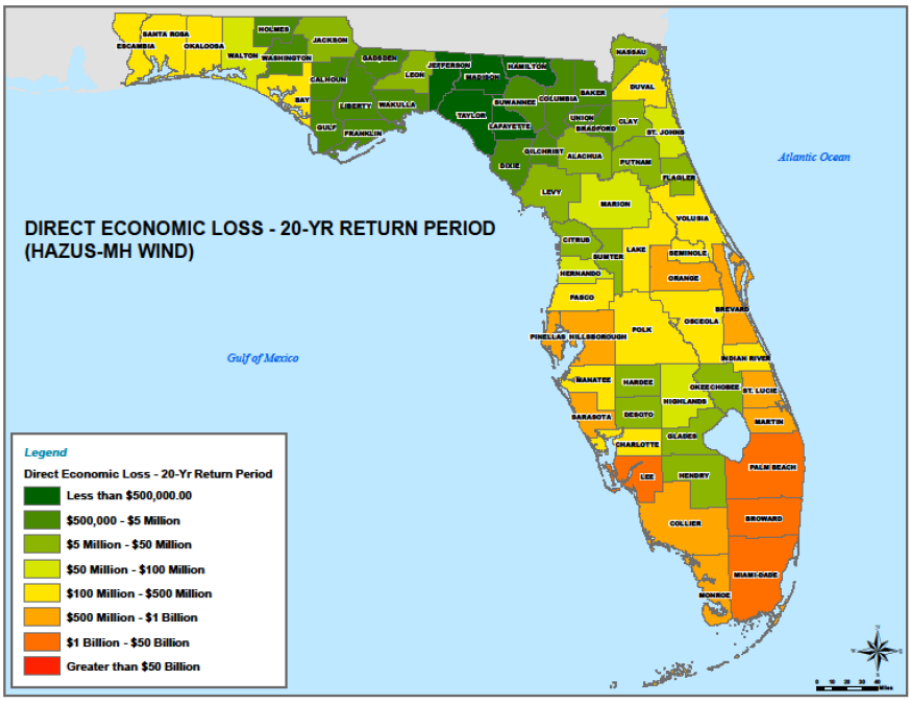


Figure VI.11: Direct Economic Loss – 20-Year Return;
Source: *2018 Florida State Enhanced Hazard Mitigation Plan*

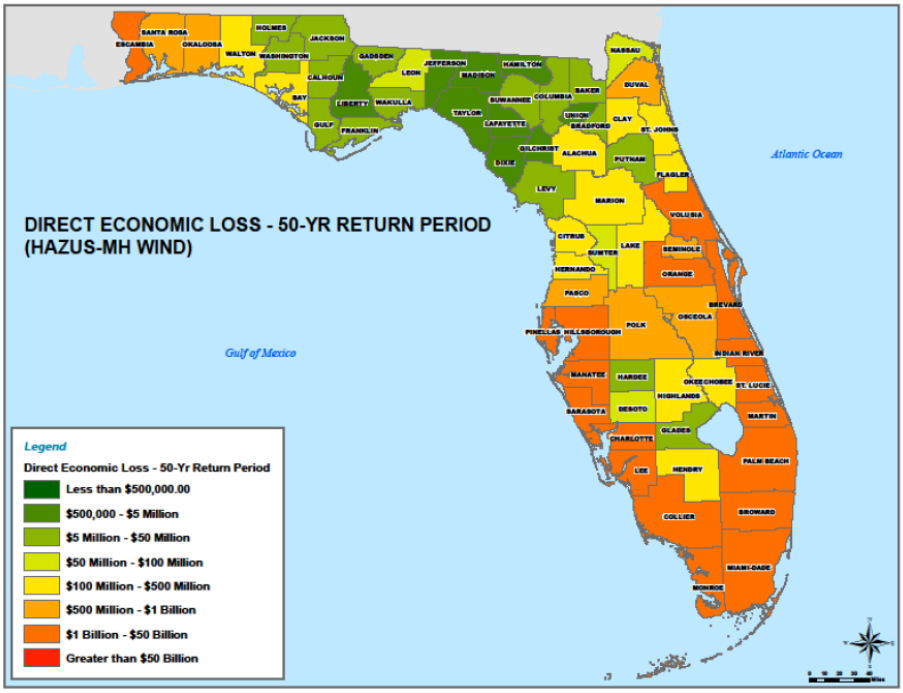


Figure VI.12: Direct Economic Loss – 50-Year Return;
Source: *2018 Florida State Enhanced Hazard Mitigation Plan*

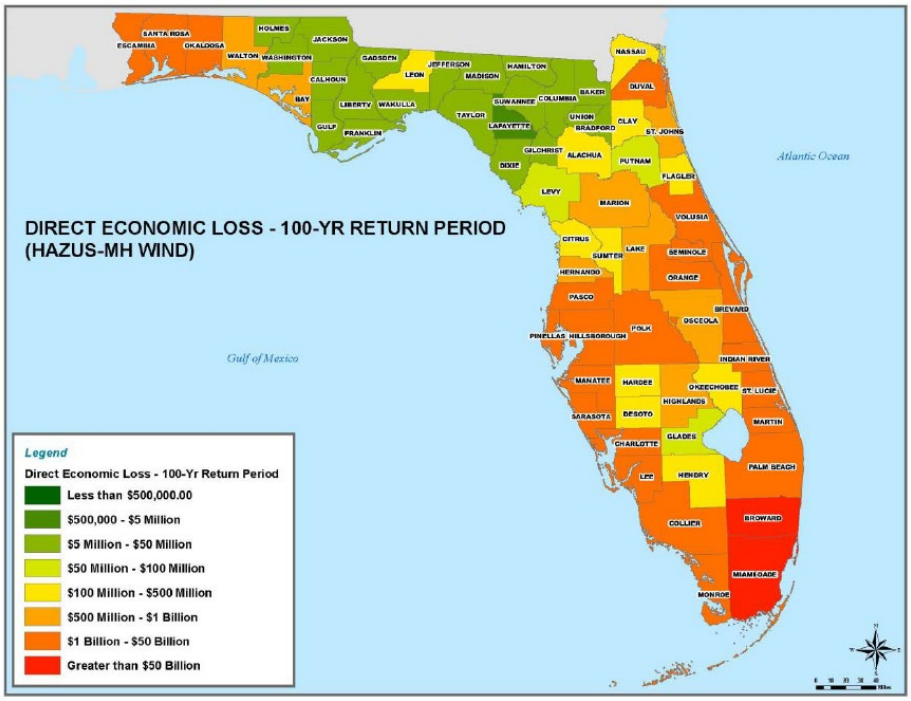


Figure VI.13: Direct Economic Loss – 100-Year Return;
Source*: 2018 Florida State Enhanced Hazard Mitigation Plan*

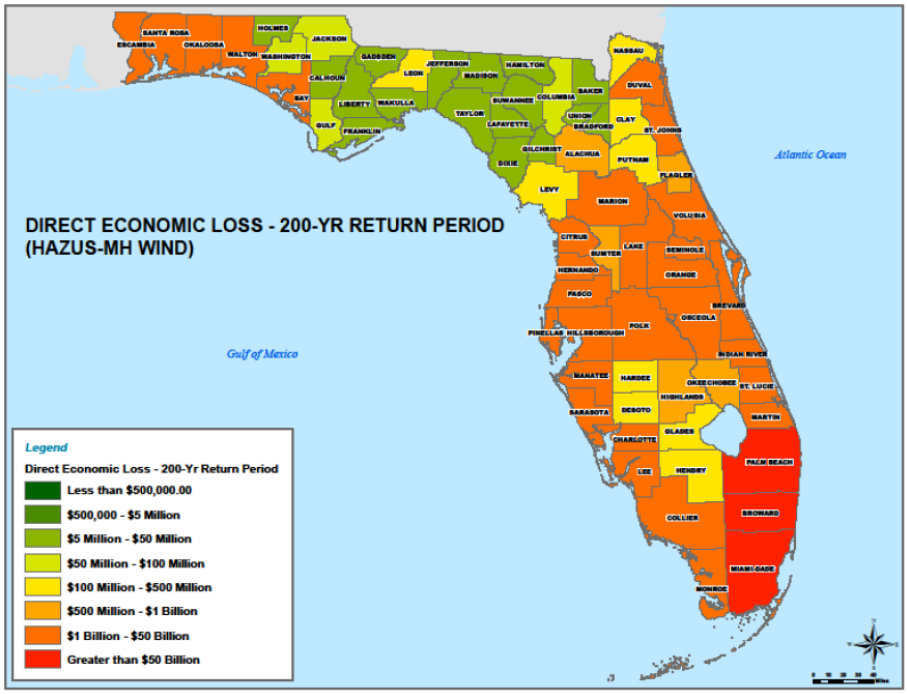


Figure VI.14: Direct Economic Loss – 200-Year Return;
Source*: 2018 Florida State Enhanced Hazard Mitigation Plan*

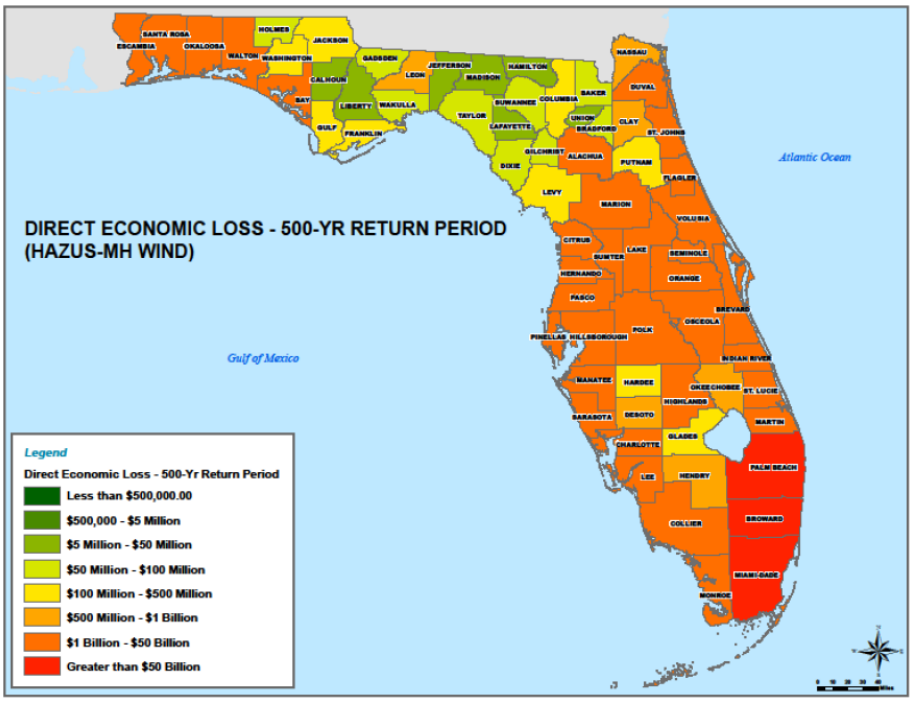


Figure VI.15: Direct Economic Loss – 500-Year Return;
Source*: 2018 Florida State Enhance Hazard Mitigation Plan*

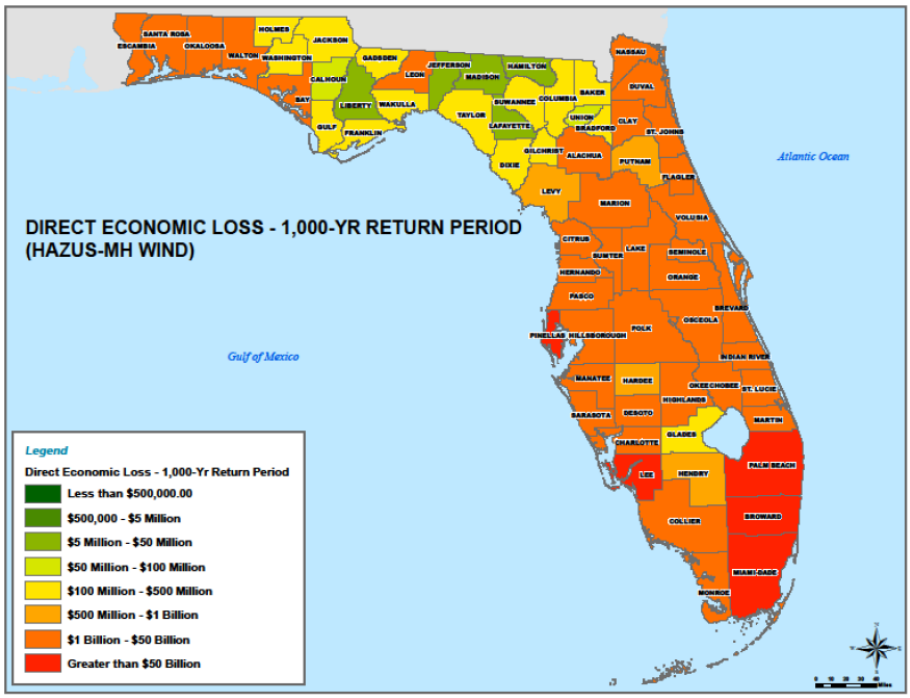


Figure VI.16: Direct Economic Loss – 1,000-Year Return;
Source*: 2018 Florida State Enhanced Hazard Mitigation Plan*

Severe Storms and Tornadoes (Hail, Lightning, and Thunderstorms)

Extent

Severe weather is defined as any meteorological event that poses a risk to life, property, social disruption, and/or requires the intervention of authorities. This includes hail, lightning, and thunderstorms. Severe storms and tornadoes affect the entire County. Many produce hail and lightning that cause significant damage. Between 1959 and May 2018, there were 27 deaths caused from lightning strikes in Polk County. According to the Spatial Hazard Events and Losses Database (SHELDUS), from 1960 through 2018, there were 223 severe storm events, resulting in 20 injuries, 2 fatalities, approximately $7.1 million in crop damages, and approximately $59.7 million in property damages in Polk County.

Hail

The Tornado and Storm Research Organization (TORRO) created the TORRO Hailstorm Intensity Scale (Table V-7) to rate the intensity of hailstorms. The Intensity Scale depends on two factors: the diameter of the hailstone, and the damage done. Based on historical occurrences (Table V-8), Polk County can expect hail events with H2 to H5 intensities, with some in the H7 and H8 range. Lake Wales has experienced an H10 intensity hailstorm.

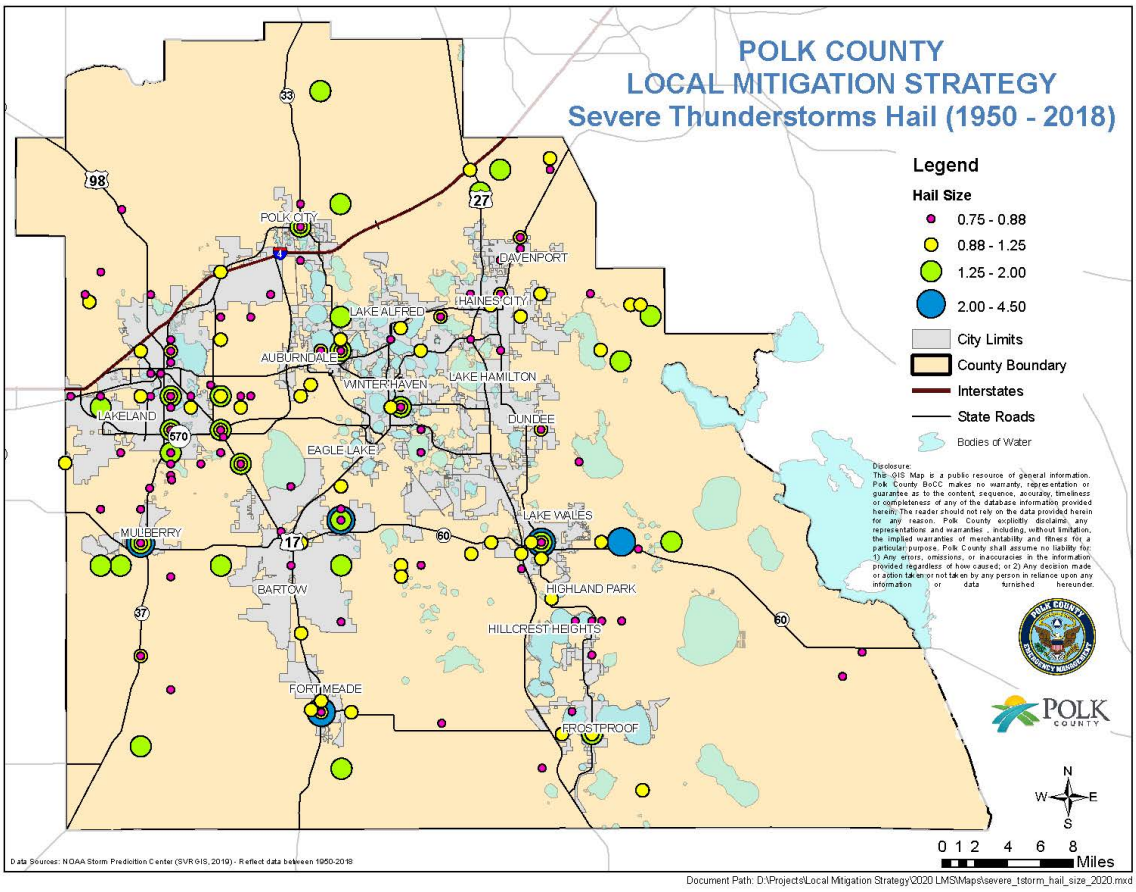


Figure VI.17: Hail locations and size; Source: *NOAA*

Vulnerability Summary

Hailstorms associated with thunderstorms may occur in any area of the County, and may be associated with damage to roofs, skylights, windows, and automobiles. Hail is more likely to damage older construction and mobile homes.

Lightning

According to National Oceanic and Atmospheric Administration (NOAA), Polk County averages approximately 67,700 cloud-to-ground lightning strikes each year, most of which occur between June and September. The large amount of open space and natural areas in Polk County are highly susceptible to lightning strikes. With 5,206 km^2 in Polk County, the County experiences approximately 13 lightning strikes per square kilometer per year. Given this regular frequency of occurrence, it can be expected that future lightning events will continue to threaten life and property throughout the county.

Vulnerability Summary

The risk of lightning is high in Polk County, mostly affecting electrical service to communities with restoration of service typically occurring within the same day. More critical is potential loss from physical damage and loss to government and business computer systems/networks. Lightening is more likely to strike properties located at higher elevations in the County, such as along the Lake Wales Ridge that generally follows the State Road 17 corridor. Municipalities in this area include Frostproof, Hillcrest Heights, Highland Park, Lake Wales, Dundee, Lake Hamilton, and Haines City. Many lightning victims are individuals who were engaged in work or recreation at the time of a lightning strike.

Thunderstorms

Because thunderstorms are not bounded by geographic or topographic characteristics, there are no means to determine whether the extent of this hazard differs from jurisdiction to jurisdiction. According to the Florida State University Florida Climate Center, Polk County can expect 90 thunderstorm days per year. The Beaufort Wind Force Scale (Table V-10) relates wind speed to observed conditions at sea and on land. Based on historical reports, the County can experience storms of 55 to 63 mph during thunderstorms or 64 to 83 mph during hurricanes. Lightening and hail are frequently a part of thunderstorm activity.

Vulnerability Summary

Polk County and its jurisdictions are vulnerable to thunderstorms. Most of the time, local thunderstorms are ephemeral events that create localized nuisance flooding. However, some thunderstorms can create significant property damage from flooding, wind, hail, lightning, and tornadoes. Thunderstorms typically cause damage by downing trees and power lines. Downed trees can block key roadways within a community, making emergency response more difficult. Downed power lines block roadways, disrupt businesses when power fails, and pose threats to people when still energized.

Mobile homes are susceptible during severe thunderstorm activity. As discussed in Section IV, in 2018, approximately 22 percent of the housing units in Polk County were mobile homes or trailers. Of the 17 municipalities, Mulberry had the highest percentage of mobile homes or trailers, with 51.9 percent of the residential structures. Fort Meade had the second highest amount of mobile homes or trailers with 25.3 percent of residential structures. Maps in Appendix A depict the mobile home densities in the County.

Tornadoes

Polk County and its jurisdictions are vulnerable to tornado activity. Maps show tornadoes have historically occurred closer to populated areas (Appendix A). EF3 and EF4 tornadoes typically occur during the dry

season with February, March, and April being the high-activity months. Although the average tornado in Polk County is an EF0, the County has experienced two F4 tornadoes, which occurred on April 15, 1958 and April 4, 1966. (See Table V-12 for tornado category, wind speed, and potential damage, and Appendix A for extent maps).

Vulnerability Summary

Polk County is highly vulnerable to severe storms and tornadoes. Severe storms are common and most infrastructure can withstand the effects of such storms. Tornadoes have greater effects, but over smaller areas, so the vulnerability is moderate. Factors contributing to tornado vulnerability are the abundance of pre-engineered structures (including manufactured housing and metal buildings), recreational vehicles used as residences, and high concentrations of elderly populations. The most vulnerable populations include those in mobile home parks, recreational vehicles, and aged or dilapidated housing. The potential for damage and loss of life increases as a function of population density. As the number of structures and people increase, the probability a tornado will cause property damage or human casualties also increases. All critical facilities in the County and jurisdictions are susceptible to tornado impacts. Contributing factors that may determine vulnerability are early warning systems and the location and availability of storm shelters constructed to withstand the forces of a tornado.

Overall Severe Storm Risk Assessment

Severe weather events such as thunderstorms, lightning, hail, high winds, and heavy rain are high-risk hazards that can impact all areas of Polk County (Appendix A). While such weather conditions can impact all populations, lack of shelter puts the homeless at highest risk. Severe weather can damage structures, disrupt utilities (mainly electrical), and affect surface/air transportation. Jurisdictions should identify recreation parks that do not have severe weather detection systems.

The existing stormwater systems in Polk County can withstand many of the frequent thunderstorms that occur during the summer months. Due to the frequent nature of severe thunderstorms in Polk County, from June 1st through November 30th, much of the population is accustom to thunderstorms such that it poses little vulnerability.

Due to the largely unpredictable frequency and tracks of tornadoes, the whole of Polk County is vulnerable to their impact. The high wind speeds associated with tornadoes leave most structures susceptible to damage, with the greatest potential for loss from mobile homes, dilapidated housing, and other less hardened properties. The danger for residents in older mobile homes emphasizes the need for Polk County to identify alternate safe locations for residents for shelter during possible tornado weather. While tornadoes can impact all populations in the County, the most vulnerable are the homeless, the elderly, and those of lower income. Depending on location and severity, tornadoes can cause social disruption in the form of electrical outages, transportation problems, economic loss, and the accompanying psychological hardships associated with physical and human loss.

Severe storm impacts are generally moderate to high and can range from short-term power outages to major structural damages. Individual/localized damages have caused major impacts to families and neighborhoods, particularly mobile home parks.

TABLE VI-7:
LEVEL OF RISK – SEVERE STORMS AND TORNADOES

Municipality	Level of Risk
Auburndale	Medium – High
Bartow	High
Davenport	Medium – High
Dundee	High
Eagle Lake	Medium – High
Fort Meade	High
Frostproof	High
Haines City	Medium – High
Highland Park	Medium – High
Hillcrest Heights	High
Lake Alfred	High
Lake Hamilton	Medium – High
Lake Wales	High
Lakeland	Medium – High
Mulberry	High
Polk City	Medium – High
Winter Haven	High
Unincorporated Polk County	High
Polk County Public Schools	High

Geologic Hazard Vulnerability and Risk

Subsidence and Sinkholes

Extent

The entire County has potential for sinkhole formation. Sinkhole area types are based on the type and thickness of material overlying the limestone. The type of sinkhole and its extent varies depending on the area type in which it is located. The Sinkhole Area Type map illustrates the regions that sinkholes tend to develop near areas of high population (Appendix A). Polk County includes all four sinkhole area types. The largest sinkhole Polk County experienced was 225 feet long, 225 feet wide, and 50 feet deep. Another major sinkhole was 200 feet long, 200 feet wide, and 150 feet deep. Sinkholes of this extent are rare.

Vulnerability Summary

The entire County and all jurisdictions have a medium to high vulnerability level, except Bartow and Lakeland, which have a high vulnerability level. The number of people adversely affected by a sinkhole is small, but there is an increased likelihood of occurrence.

Sinkholes can occur in any area of Polk County, but as shown on the maps in Appendix A Bartow, Lakeland, and Lake Wales have experienced the most occurrences. All structures, utilities, systems, and populations are equally vulnerable. Depending on the location and size of a sinkhole, the social and economic impact can range from minor to extensive. While sinkholes have been reported throughout the County, most are small and cause little damage.

TABLE VI-8:
LEVEL OF RISK – SINKHOLES

	Level of Risk
Auburndale	Medium - High
Bartow	High
Davenport	Medium - High
Dundee	Medium - High
Eagle Lake	Medium - High
Fort Meade	High
Frostproof	High
Haines City	Medium - High
Highland Park	Medium - High
Hillcrest Heights	High
Lake Alfred	High
Lake Hamilton	High
Lake Wales	High
Lakeland	Medium - High
Mulberry	High
Polk City	Medium - High
Winter Haven	High
Unincorporated Polk County	Medium - High
Polk County Public Schools	Medium - High

Risk Assessment

There is a medium to high level of risk for sinkholes in Polk County. Sinkhole impacts range from minor damage to a home or road, to an entire city block. With the average annual income per capita in the $25,000 to $30,000 range, most residents do not have enough insurance and are unable to pay for major repairs. Sinkholes may affect the economy in several ways:

- Reduce real estate sales and profits; and
- Increase in insurance costs and uninsured losses becoming more frequent as affordable insurance becomes less available.

Sinkholes can impact every part of the County. The tables below show the dollar amounts for each building type that is within the sink hole area type, as illustrated on the sinkhole map in Appendix A. The dollar values indicate the total amount that is exposed (building value), but a dollar estimate is impossible to project because of the localization of the sinkhole hazard.

TABLE VI-9a:
SINKHOLE EXPOSURE AND POTENTIAL LOSSES – UNINCORPORATED POLK COUNTY

Building Type	Area Type I	Area Type II	Area Type III	Area Type IV	Total
Agriculture	$41,724,911	$ 8,873,038	$146,139,158	$ 29,408,070	**$226,145,177**
Residential	$4,122,213	$17,069,833	$422,269,515	$52,759,799	**$496,221,360**
Commercial/ Industrial	$27,692,201	$9,440,970	$354,287,013	$68,010,364	**$459,430,548**
Government/ Institutional	$268,721,270	$530,717	$586,419,215	$28,763,302	**$884,434,504**
Miscellaneous	$6,281,634	$5,241,736	$245,615,597	$7,036,599	**$264,175,566**
Total	**$1,116,710**	**$272,856**	**$9,771,180**	**$25,237,239**	**$36,397,985**

TABLE VI-9b:
SINKHOLE EXPOSURE AND POTENTIAL LOSSES – AUBURNDALE

Use	Area Type I	Area Type II	Area Type III	Area Type IV	Total
Agriculture	$0	$0	6,007,436	$0	**$6,007,436**
Residential	$0	$0	511,980,047	$0	**$511,980,047**
Commercial/ Industrial	$63,672	$0	219,347,200	$0	**$219,410,872**
Government/ Institutional	$0	$0	42,931,361	$0	**$42,931,361**
Miscellaneous	$0	$0	6,146,997	$0	**$6,146,997**
Total	**$63,672**	**$0**	**786,413,041**	**$0**	**$786,476,713**

TABLE VI-9c:
SINKHOLE EXPOSURE AND POTENTIAL LOSSES – BARTOW

Use	Area Type I	Area Type II	Area Type III	Area Type IV	Total
Agriculture	$0	$0	$939,617	$440,210	**$1,379,827**
Residential	$0	$0	$491,485,307	$0	**$491,485,307**
Commercial/ Industrial	$0	$0	$121,555,442	$0	**$121,555,442**
Government/ Institutional	$0	$0	$174,518,860	$ 36,121	**$174,554,981**
Miscellaneous	$0	$0	$1,155,596	$0	**$1,155,596**
Total	**$0**	**$0**	**$789,654,822**	**$476,331**	**$790,131,153**

TABLE VI-9d:
SINKHOLE EXPOSURE AND POTENTIAL LOSSES – DAVENPORT

Use	Area Type I	Area Type II	Area Type III	Area Type IV	Total
Agriculture	$0	$0	$453,585	$0	**$453,585**
Residential	$0	$0	$258,512,537	$0	**$258,512,537**
Commercial/ Industrial	$0	$0	$7,209,554	$0	**$7,209,554**
Government/ Institutional	$0	$0	$5,329,013	$0	**$5,329,013**
Miscellaneous	$0	$0	$135,254	$0	**$135,254**
Total	**$0**	**$0**	**$271,639,943**	**$0**	**$271,639,943**

TABLE VI-9e:
SINKHOLE EXPOSURE AND POTENTIAL LOSSES – DUNDEE

Use	Area Type I	Area Type II	Area Type III	Area Type IV	Total
Agriculture	$0	$0	$2,248,493	$0	**$2,248,493**
Residential	$0	$0	$121,333,178	$0	**$121,333,178**
Commercial/ Industrial	$0	$0	$23,117,269	$0	**$23,117,269**
Government/ Institutional	$0	$0	$11,536,471	$0	**$11,536,471**
Miscellaneous	$0	$0	$98,020	$0	**$98,020**
Total	**$0**	**$0**	**$158,333,431**	**$0**	**$158,333,431**

TABLE VI-9f:
SINKHOLE EXPOSURE AND POTENTIAL LOSSES – EAGLE LAKE

Use	Area Type I	Area Type II	Area Type III	Area Type IV	Total
Agriculture	$0	$0	$909,367	$0	**$909,367**
Residential	$0	$0	$71,399,792	$0	**$71,399,792**
Commercial/ Industrial	$0	$0	$6,972,090	$0	**$6,972,090**
Government/ Institutional	$0	$0	$25,133,715	$0	**$25,133,715**
Miscellaneous	$0	$0	$49,346	$0	**$49,346**
Total	**$0**	**$0**	**$104,464,310**	**$0**	**$104,464,310**

TABLE VI-9g:
SINKHOLE EXPOSURE AND POTENTIAL LOSSES – FORT MEADE

Use	Area Type I	Area Type II	Area Type III	Area Type IV	Total
Agriculture	$0	$0	$0	$554,696	**$554,696**
Residential	$0	$0	$0	$101,968,550	**$101,968,550**
Commercial/ Industrial	$0	$0	$0	$13,463,879	**$13,463,879**
Government/ Institutional	$0	$0	$0	$14,776,981	**$14,776,981**
Miscellaneous	$0	$0	$0	$262,483	**$262,483**
Total	**$0**	**$0**	**$0**	**$131,026,589**	**$131,026,589**

TABLE VI-9h:
SINKHOLE EXPOSURE AND POTENTIAL LOSSES – FROSTPROOF

Use	Area Type I	Area Type II	Area Type III	Area Type IV	Total
Agriculture	$0	$0	$1,884,258	$0	**$1,884,258**
Residential	$0	$0	$53,091,103	$0	**$53,091,103**
Commercial/ Industrial	$0	$0	$36,499,192	$0	**$36,499,192**
Government/ Institutional	$0	$0	$40,803,080	$593,097	**$41,396,177**
Miscellaneous	$0	$0	$63,970	$0	**$63,970**
Total	**$0**	**$0**	**$132,341,603**	**$593,097**	**$132,934,700**

TABLE VI-9i:
SINKHOLE EXPOSURE AND POTENTIAL LOSSES – HAINES CITY

Use	Area Type I	Area Type II	Area Type III	Area Type IV	Total
Agriculture	$0	$0	$1,570,771	$0	**$1,570,771**
Residential	$0	$0	$716,023,672	$0	**$716,023,672**
Commercial/ Industrial	$0	$0	$199,890,281	$0	**$199,890,281**
Government/ Institutional	$0	$0	$73,793,971	$0	**$73,793,971**
Miscellaneous	$0	$0	$263,842	$0	**$263,842**
Total	**$0**	**$0**	**$991,542,537**	**$0**	**$991,542,537**

TABLE VI-9j:
SINKHOLE EXPOSURE AND POTENTIAL LOSSES – HIGHLAND PARK

Use	Area Type I	Area Type II	Area Type III	Area Type IV	Total
Agriculture	$0	$0	$0	$0	**$0**
Residential	$0	$0	$11,986,266	$0	**$11,986,266**
Commercial/ Industrial	$0	$0	$38,901	$0	**$38,901**
Government/ Institutional	$0	$0	$0	$0	**$0**
Miscellaneous	$0	$0	$0	$0	**$0**
Total	**$0**	**$0**	**$12,025,167**	**$0**	**$12,025,167**

TABLE VI-9k:
SINKHOLE EXPOSURE AND POTENTIAL LOSSES – HILLCREST HEIGHTS

Use	Area Type I	Area Type II	Area Type III	Area Type IV	Total
Agriculture	$0	$0	$0	$0	**$0**
Residential	$0	$0	$14,791,440	$0	**$14,791,440**
Commercial/ Industrial	$0	$0	$0	$0	**$0**
Government/ Institutional	$0	$0	$19,858	$0	**$19,858**
Miscellaneous	$0	$0	$0	$0	**$0**
Total	**$0**	**$0**	**$14,811,298**	**$0**	**$14,811,298**

TABLE VI-9l:
SINKHOLE EXPOSURE AND POTENTIAL LOSSES – LAKE ALFRED

Use	Area Type I	Area Type II	Area Type III	Area Type IV	Total
Agriculture	$0	$0	$1,320,430	$0	**$1,320,430**
Residential	$0	$0	$155,302,161	$0	**$155,302,161**
Commercial/ Industrial	$0	$0	$12,952,018	$0	**$12,952,018**
Government/ Institutional	$0	$0	$30,159,217	$0	**$30,159,217**
Miscellaneous	$0	$0	$91,197	$0	**$91,197**
Total	**$0**	**$0**	**$199,825,023**	**$0**	**$199,825,023**

TABLE VI-9m:
SINKHOLE EXPOSURE AND POTENTIAL LOSSES – LAKE HAMILTON

Use	Area Type I	Area Type II	Area Type III	Area Type IV	Total
Agriculture	$0	$0	$853,746	$0	**$853,746**
Residential	$0	$0	$46,921,384	$0	**$46,921,384**
Commercial/ Industrial	$0	$0	$23,299,828	$0	**$23,299,828**
Government/ Institutional	$0	$0	$1,893,468	$0	**$1,893,468**
Miscellaneous	$0	$0	$36,144	$0	**$36,144**
Total	**$0**	**$0**	**$73,004,570**	**$0**	**$73,004,570**

TABLE VI-9n:
SINKHOLE EXPOSURE AND POTENTIAL LOSSES – LAKE WALES

Use	Area Type I	Area Type II	Area Type III	Area Type IV	Total
Agriculture	$0	$0	$2,359,510	$0	**$2,359,510**
Residential	$0	$0	$424,203,051	$0	**$424,203,051**
Commercial/ Industrial	$0	$0	$148,009,298	$0	**$148,009,298**
Government/ Institutional	$0	$0	$88,974,641	$0	**$88,974,641**
Miscellaneous	$0	$0	$395,668	$0	**$395,668**
Total	**$0**	**$0**	**$663,942,168**	**$0**	**$663,942,168**

TABLE VI-9o:
SINKHOLE EXPOSURE AND POTENTIAL LOSSES – LAKELAND

Use	Area Type I	Area Type II	Area Type III	Area Type IV	Total
Agriculture	$0	$0	$14,406,999	$0	**$14,406,999**
Residential	$0	$0	$3,028,436,987	$0	**$3,028,436,987**
Commercial/ Industrial	$0	$0	$1,467,173,326	$0	**$1,467,173,326**
Government/ Institutional	$0	$0	$870,401,322	$0	**$870,401,322**
Miscellaneous	$0	$0	$1,928,368	$0	**$1,928,368**
Total	**$0**	**$0**	**$5,382,347,002**	**$0**	**$5,382,347,002**

TABLE VI-9p:
SINKHOLE EXPOSURE AND POTENTIAL LOSSES – MULBERRY

Use	Area Type I	Area Type II	Area Type III	Area Type IV	Total
Agriculture	$0	$0	$109,392	$0	**$109,392**
Residential	$0	$0	$42,708,922	$0	**$42,708,922**
Commercial/ Industrial	$0	$0	$56,730,796	$0	**$56,730,796**
Government/ Institutional	$0	$0	$38,664,586	$0	**$38,664,586**
Miscellaneous	$0	$0	$887,580	$0	**$887,580**
Total	**$0**	**$0**	**$139,101,276**	**$0**	**$139,101,276**

TABLE VI-9q:
SINKHOLE EXPOSURE AND POTENTIAL LOSSES– POLK CITY

Use	Area Type I	Area Type II	Area Type III	Area Type IV	Total
Agriculture	$7,972	$0	$11,753	$0	**$19,725**
Residential	$6,512,783	$0	$77,322,142	$0	**$83,834,925**
Commercial/ Industrial	$6,921,302	$0	$3,101,562	$0	**$10,022,864**
Government/ Institutional	$3,031,968	$0	$2,174,781	$0	**$5,206,749**
Miscellaneous	$30,477	$0	$30,477	$0	**$60,954**
Total	**16,504,502**	**$0**	**$82,640,715**	**$0**	**$99,145,217**

TABLE VI-9r:
SINKHOLE EXPOSURE AND POTENTIAL LOSSES – WINTER HAVEN

Use	Area Type I	Area Type II	Area Type III	Area Type IV	Total
Agriculture	$0	$0	$24,053,313	$0	**$24,053,313**
Residential	$0	$0	$1,479,904,165	$0	**$1,479,904,165**
Commercial/ Industrial	$0	$0	$412,611,569	$0	**$412,611,569**
Government/ Institutional	$0	$0	$183,374,446	$0	**$183,374,446**
Miscellaneous	$0	$0	$520,418	$0	**$520,418**
Total	**$0**	**$0**	**$2,100,463,911**	**$0**	**$2,100,463,911**

Hydrologic Hazard Vulnerability and Risk

Drought

Extent

A hydrological drought can affect the entire County. The Palmer Drought Severity Index (PDSI) uses readily available temperature and precipitation data to estimate relative dryness. It is a standardized index that spans -10 (dry) to +10 (wet). Maps of operational agencies like NOAA typically show a range of -4 to +4, but more extreme values are possible. The extent of damage is normally minimal. As illustrated in Figure VI-19, the extent of drought in Florida has reached and exceeded -4 on occasion, but generally is at -2. Polk County can expect a minor drought once every 2 to 3 years.

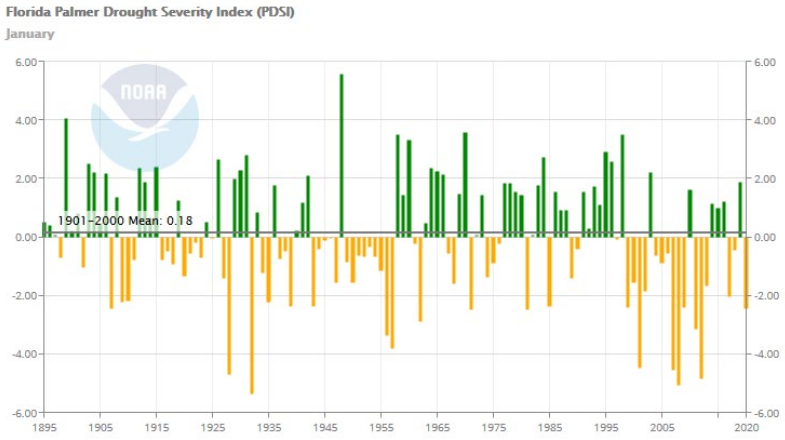


Figure VI.18: Florida Palmer Drought Severity Index; Source: NOAA

Vulnerability Summary

To date there have been no recorded human or significant economic impacts from droughts in Polk County; therefore, the impact is low to moderate. However, being an agricultural county, a major long-

term hydrological drought that causes loss of an entire year's crops may cause more than $350 million in damages and millions more to lawns and landscaping. A more likely event would result in a 5 to 10 percent reduction in crop yield and $17.5 to $35 million in losses. A drought may also impact the County's $34.2 million annual livestock industry.

Drought affects water supplies, agriculture, and fire danger levels and is based on the severity of these impacts. Drought may dramatically affect local natural lake levels. As the water table responds to the lack of rain by a decrease in the level of the potentiometric surface of the Floridan aquifer underlying Polk County, many lakes having karst (sinkhole) connections to the aquifer respond by draining into the aquifer and therefore drying out. This is a natural process that has been occurring for millennia, but it can interfere with traditional uses of these lakes, and can increase fire danger through the many terrestrial plants that move into the dry lake beds over time.

The characteristics of population, activities, or the environment that make them susceptible to the effects of drought are the basis for the measurement of vulnerability to drought conditions. The degree of vulnerability depends on environmental and social characteristics of the region and the ability to anticipate, cope with, resist, and recover from drought. Drought can particularly exacerbate demand for potable water (until such time as more reclaimed water is available). Drought in Florida can contribute to sinkhole development, impede farm productivity, and strain local water supplies.

Vulnerability to drought/heat wave is low to medium. Vulnerability increases if water levels drop to a point where officials expand water restrictions to include agriculture.

Risk Assessment

All municipalities within the County are at a low risk of drought or heat wave hazard. Droughts do not impact structures, so the LMS does not include a dollar loss estimated.

The LMS Working Group did not perform an assessment of potential dollar costs since droughts are not expected to damage existing or future structures or critical facilities. Consequences associated with drought can impact public health, agricultural productivity, economic recovery assistance programs, and mass care.

Flood

Extent

Water depth levels and amount of damage determine the extent of a flood. Polk County is subject to flooding due to heavy rains and river flooding. The FEMA Flood Insurance Rate Map (FIRM) (Appendix A) helps determine the extent of flood hazard in each of the municipalities. FEMA classifies land area through flood zones and categorizes the probability of a flood occurrence. The County's FIRM (Appendix A) illustrates these flood zones. According to FEMA, a flood event having a 1-percent chance of being equaled or exceeded in any given year will inundate the Special Flood Hazard Area (SFHA). The 1-percent annual chance flood is the base flood or 100-year flood. SFHAs included in Polk County include Zone A, Zone AH, and Zone AE. These categories indicate a probability of occurrence. The smaller percent chance of occurrence, the more devastating the flood. In a worst-case scenario event, isolated areas in Polk County can expect to experience up to 10 feet of flood waters while average flood water depths are 4 feet to 5 feet.

The Peace River had a recorded maximum crest of 11.13 feet on September 12, 2004 (National Weather Service, Advanced Hydrologic Prediction Service). Flood stage begins at 8 feet, with major stage beginning at 10 feet. On July 1, 2004, June rainfall of 14 to 18 inches in eastern Polk County increased lake water levels from Lake Wales to Frostproof. Water levels were already high after three hurricanes moved over the area in 2004 and some lake levels rose 10 feet in a 12-month period. The flooding resulted in the loss of approximately 107 manufactured homes, and water surrounded approximately 175 of the 700 homes at Saddlebag Lake. The County performed pumping operations to lower lake levels. There are no natural outlets for most of the lakes in eastern Polk County. The damage estimates for this event were approximately $1.6 million.

The severity or magnitude of flooding throughout the County depends on several factors: the amount, location and duration of rainfall, soil saturation, upstream conditions, and lake stage levels. Depth of water is a basis for measuring the extent of flooding. Base flood elevations are the computed elevation to which FEMA anticipated floodwater to rise during the base flood. FIRMs and the flood profiles show the Base Flood Elevations.

Vulnerability Summary

Florida is susceptible to seasonal hurricanes that can cause severe flooding. Approximately 42 percent of the County is in one of the FEMA SFHA designations. A significant percentage of the County's population lives or works in areas that are at risk of flooding. Mobile homes and septic tanks are particularly susceptible to damage from flooding. Fresh water flooding has the highest potential along the five rivers and around the 554 lakes in the County.

For the people who live along the banks of the various rivers and the numerous lakes, or other low-lying areas, vulnerability is higher than normal and the impact potentially great. However, for the County, vulnerability is medium. During periods of heavy rainfall, several communities in low-lying areas anticipate flooding and some damage to property and infrastructure.

One contributing factor that may affect flood vulnerability is the County's early warning systems. The Polk County Division of Emergency Management maintains the Alert Polk system, which provides information about situations that may affect people's health and safety relevant to the addresses they provide. During emergencies, residents can listen to PGTV (Bright House 622, Verizon 20, Comcast 5, www.polk-county.net), local television stations, and primary emergency broadcast system radio stations: WONN 1230 AM, WPCV 97.5 FM, Travelers Information System 1610 AM, or En Español (WSIR 1490 AM, WAUC 1310 AM, WAVP 1390 AM) to obtain additional information.

TABLE VI-10:
LEVEL OF RISK – FLOODING

Jurisdiction	Level of Risk
Auburndale	Low
Bartow	Low-Medium
Davenport	Low
Dundee	Low
Eagle Lake	Low - Medium

TABLE VI-10:
LEVEL OF RISK – FLOODING

Jurisdiction	Level of Risk
Fort Meade	Low - Medium
Frostproof	Low
Haines City	Low
Highland Park	Low
Hillcrest Heights	Low
Lake Alfred	Low - Medium
Lake Hamilton	Low - Medium
Lake Wales	Low - Medium
Lakeland	Low - Medium
Mulberry	Low
Polk City	Low
Winter Haven	Low
Unincorporated Polk County	Medium
Polk County Public Schools	Medium

Risk Assessment

The impacts to victims of a flood are moderate to high. Most residents cannot return to/live in their homes until they complete repairs and clean-up. Even with flood insurance, the cost to the homeowner can be in the thousands of dollars. Conversely, floods may be profitable for some businesses, such as those specializing in flooring, appliances, and furniture. The tables below indicate the acreage of land and value of buildings in the Special High Hazard Area by Polk County Property Appraiser assigned DOR Use Code for each jurisdiction. The acreage includes any parcel with a Special High Hazard designation and is not the acreage of the Special High Hazard Area. The Special High Hazard Area designation impacts approximately 1 million acres of parcels and $6.65 billion of building valuation in Polk County. The municipalities include 42 percent of the building values and 80 percent of the total values.

TABLE VI-11a:
SPECIAL HIGH HAZARD AREA POTENTIAL LOSSES – UNINCORPORATED POLK COUNTY

Use	Parcel Acreage	Building Value ($)	Total Value ($)
Agriculture	348,468	165,716,381	1,116,573,898
Residential	67,573	2,802,587,477	4,440,096,059
Commercial/Industrial	23,073	505,972,382	1,331,571,453
Government/Institutional	255,050	374,052,495	616,820,690
Miscellaneous	191,153	30,250,603	315,466,059
Total	**885,317**	**3,878,579,338**	**7,820,528,159**

TABLE VI-11b:
SPECIAL HIGH HAZARD AREA POTENTIAL LOSSES – AUBURNDALE

Use	Parcel Acreage	Building Value ($)	Total Value ($)
Agriculture	3,125	5,079,485	21,398,034
Residential	889	73,992,582	122,715,801
Commercial/Industrial	403	107,783,833	138,246,525
Government/Institutional	2,958	9,900,388	35,032,906
Miscellaneous	1,471	121,088	1,407,777
Total	**8,847**	**196,877,376**	**318,801,043**

TABLE VI-11c:
SPECIAL HIGH HAZARD AREA POTENTIAL LOSSES – BARTOW

Use	Parcel Acreage	Building Value ($)	Total Value ($)
Agriculture	19,228	1,145,756	42,326,481
Residential	264	25,819,414	44,242,599
Commercial/Industrial	767	15,133,152	29,456,451
Government/Institutional	4,986	48,911,222	62,186,673
Miscellaneous	2,620	450,463	3,873,976
Total	**27,865**	**91,460,007**	**182,086,180**

TABLE VI-11d:
SPECIAL HIGH HAZARD AREA POTENTIAL LOSSES – DAVENPORT

Use	Parcel Acreage	Building Value ($)	Total Value ($)
Agriculture	432	29,553	5,044,212
Residential	317	23,862,853	32,722,079
Commercial/Industrial	14	444,173	1,197,384
Government/Institutional	54	1,926,202	2,518,187
Miscellaneous	87	135,254	971,757
Total	**904**	**26,398,035**	**42,453,619**

TABLE VI-11e:
SPECIAL HIGH HAZARD AREA POTENTIAL LOSSES – DUNDEE

Use	Parcel Acreage	Building Value ($)	Total Value ($)
Agriculture	2,021	114,518	15,846,430
Residential	158	4,187,518	7,422,377
Commercial/Industrial	271	11,267,939	30,158,541
Government/Institutional	743	905,897	2,170,345
Miscellaneous	399	0	1,560,767
Total	**3,593**	**16,475,872**	**57,158,460**

TABLE VI-11f:
SPECIAL HIGH HAZARD AREA POTENTIAL LOSSES – EAGLE LAKE

Use	Parcel Acreage	Building Value ($)	Total Value ($)
Agriculture	215	909,367	3,373,198
Residential	95	14,592,749	20,600,512
Commercial/Industrial	24	0	598,672
Government/Institutional	1,258	18,662,615	20,262,175
Miscellaneous	153	17,111	344,409
Total	**1,745**	**34,181,842**	**45,178,966**

TABLE VI-11g:
SPECIAL HIGH HAZARD AREA POTENTIAL LOSSES – FORT MEADE

Use	Parcel Acreage	Building Value ($)	Total Value ($)
Agriculture	786	441,759	2,060,782
Residential	81	2,532,913	3,488,180
Commercial/Industrial	370	1,332,003	6,571,259
Government/Institutional	799	3,475,282	4,681,424
Miscellaneous	1,312	-	3,320,908
Total	**3,348**	**7,781,957**	**20,122,553**

TABLE VI-11h:
SPECIAL HIGH HAZARD AREA POTENTIAL LOSSES – FROSTPROOF

Use	Parcel Acreage	Building Value ($)	Total Value ($)
Agriculture	2,678	670,794	17,685,987
Residential	155	11,684,945	19,360,170
Commercial/Industrial	149	6,821,399	16,685,897
Government/Institutional	5,477	28,970,201	31,383,372
Miscellaneous	651	0	465,635
Total	**9,110**	**48,147,339**	**85,581,061**

TABLE VI-11i:
SPECIAL HIGH HAZARD AREA POTENTIAL LOSSES – HAINES CITY

Use	Parcel Acreage	Building Value ($)	Total Value ($)
Agriculture	2,892	1,250,076	27,254,922
Residential	1,030	57,991,289	90,200,499
Commercial/Industrial	1,129	51,706,826	151,427,704
Government/Institutional	425	14,872,059	24,497,017
Miscellaneous	952	13,369	1,541,461
Total	**6,428**	**125,833,619**	**294,921,603**

TABLE VI-11j:
SPECIAL HIGH HAZARD AREA POTENTIAL LOSSES – HIGHLAND PARK

Use	Parcel Acreage	Building Value ($)	Total Value ($)
Agriculture	0	0	0
Residential	41	5,450,309	7,937,623
Commercial/Industrial	93	0	445,209
Government/Institutional	464	0	153,348
Miscellaneous	0	0	0
Total	**599**	**5,450,309**	**8,536,180**

TABLE VI-11k:
SPECIAL HIGH HAZARD AREA POTENTIAL LOSSES – HILLCREST HEIGHTS

Use	Parcel Acreage	Building Value ($)	Total Value ($)
Agriculture	221	-	289,567
Residential	0	0	0
Commercial/Industrial	0	0	0
Government/Institutional	5,446	0	5,445
Miscellaneous	0	0	0
Total	**5,667**	**0**	**295,012**

TABLE VI-11l:
SPECIAL HIGH HAZARD AREA POTENTIAL LOSSES – LAKE ALFRED

Use	Parcel Acreage	Building Value ($)	Total Value ($)
Agriculture	2,358	1,320,430	12,136,813
Residential	553	25,181,949	42,060,051
Commercial/Industrial	294	1,443,619	15,976,678
Government/Institutional	1,548	21,060,713	36,100,901
Miscellaneous	1,579	-	1,999,817
Total	**6,331**	**49,006,711**	**108,274,260**

TABLE VI-11m:
SPECIAL HIGH HAZARD AREA POTENTIAL LOSSES – LAKE HAMILTON

Use	Parcel Acreage	Building Value ($)	Total Value ($)
Agriculture	525	551,619	6,256,427
Residential	157	12,273,721	20,027,395
Commercial/Industrial	134	17,316,574	23,167,170
Government/Institutional	576	22,704	243,815
Miscellaneous	95	0	353,415
Total	**1,487**	**30,164,618**	**50,048,222**

TABLE VI-11n:
SPECIAL HIGH HAZARD AREA POTENTIAL LOSSES – LAKE WALES

Use	Parcel Acreage	Building Value ($)	Total Value ($)
Agriculture	3,418	2,359,510	11,697,788
Residential	338	29,586,267	58,035,908
Commercial/Industrial	1,594	38,111,873	118,603,582
Government/Institutional	2,081	41,680,027	48,324,326
Miscellaneous	1,354	17,020	3,219,089
Total	**8,784**	**111,754,697**	**239,880,693**

TABLE VI-11o:
SPECIAL HIGH HAZARD AREA POTENTIAL LOSSES – LAKELAND

Use	Parcel Acreage	Building Value ($)	Total Value ($)
Agriculture	8,093	14,395,201	126,675,672
Residential	2,850	330,526,438	699,231,978
Commercial/Industrial	5,277	639,402,320	1,085,594,417
Government/Institutional	11,895	430,049,139	611,808,465
Miscellaneous	2,087	0	7,620,051
Total	**30,201**	**1,414,373,098**	**2,530,930,583**

TABLE VI-11p:
SPECIAL HIGH HAZARD AREA POTENTIAL LOSSES – MULBERRY

Use	Parcel Acreage	Building Value ($)	Total Value ($)
Agriculture	1,835	109,392	9,543,653
Residential	98	5,107,992	6,690,153
Commercial/Industrial	726	30,548,255	85,445,899
Government/Institutional	1,033	33,401,350	37,378,477
Miscellaneous	251	741,006	1,214,999
Total	**3,943**	**69,907,995**	**140,273,181**

TABLE VI-11q:
SPECIAL HIGH HAZARD AREA POTENTIAL LOSSES – POLK CITY

Use	Parcel Acreage	Building Value ($)	Total Value ($)
Agriculture	1,537	19,725	4,899,250
Residential	378	13,211,809	23,895,142
Commercial/Industrial	180	2,115,038	8,628,413
Government/Institutional	191	1,346,537	1,957,827
Miscellaneous	179	0	624,674
Total	**2,465**	**16,693,109**	**40,005,306**

TABLE VI-11r:
SPECIAL HIGH HAZARD AREA POTENTIAL LOSSES – WINTER HAVEN

Use	Parcel Acreage	Building Value ($)	Total Value ($)
Agriculture	4,883	23,624,156	67,885,573
Residential	2,908	310,979,173	525,798,077
Commercial/Industrial	3,085	120,922,761	242,204,361
Government/Institutional	5,648	74,670,537	131,864,996
Miscellaneous	2,742	0	6,693,114
Total	**19,265**	**530,196,627**	**974,446,121**

Other Natural Hazard Vulnerability and Risk

Climate Change

Extent

Climate change includes the potential for increased storm events, changes in temperature, changes in rain patterns, changes in flora and fauna, and sea level rise. While the County and its jurisdictions have not experienced a direct impact resulting from climate change, impacts may occur, especially affecting the agricultural industry.

Figure V.35 illustrates the historic change in mean temperature in Polk County from 1895 to 2020. The mean temperature in Polk County has been on an upward trend since before 1895. The trend has been accelerating since the 1960s. Mean temperature has risen 4.8°F degrees in the last 125 years.

Vulnerability Summary

The entire County is vulnerable to the effects of climate change. Polk County leads the State in terms of citrus production and number of commercial agriculture acreage devoted to citrus. Over 82,000 acres are devoted to this one industry. Agricultural lands and economic pursuits are vulnerable to changes in temperatures, water quantity and quality, and severity of storms. As sea level rises and impacts the coastal counties of Florida, there will be an increased demand for all resources and land as more people move inland. While the impacts may be great to the economy of the County, the timeframe for change and the

potential for supportive legislation and actions to address the impacts of climate change result in a low risk level for the County.

Risk Assessment

Though the LMS Working Group recognizes that the County, its jurisdictions, and partners are vulnerable to climate change, there is a lack of data to quantify vulnerability. The LMS Working Group recognizes with a changing climate, there is potential for increased risk of environmental impacts from the hazards identified in the LMS, and potential additional hazards, and that jurisdictions should consider future mitigation and adaptation strategies related to this hazard.

Wildfire

Extent

As a predominately rural county, most of the area is vulnerable to the effects of wildfires. Based on mapping by the Southern Wildfire Risk Assessment, most of the County has a medium to high burn probability (Figure VI.21). Fuel source, which includes the material the fire draws from and the amount of acreage it burns, contributes to the extent of the wildfire risk.

According to the 2011 Polk County Community Wildfire Protection Plan (CWPP), located in Appendix E, Polk County has over 600,000 acres of farmland and approximately 275,000 acres of publicly managed conservation lands. Approximately 220,000 acres in northern Polk County, known as the Green Swamp, consist of a series of wetlands, flat lands, and sand hills supporting agriculture, wildlife habitat, conservation areas, and rural residential development. Other conservation areas include the Avon Park Air Force Range and the Lake Wales Ridge State Forest.

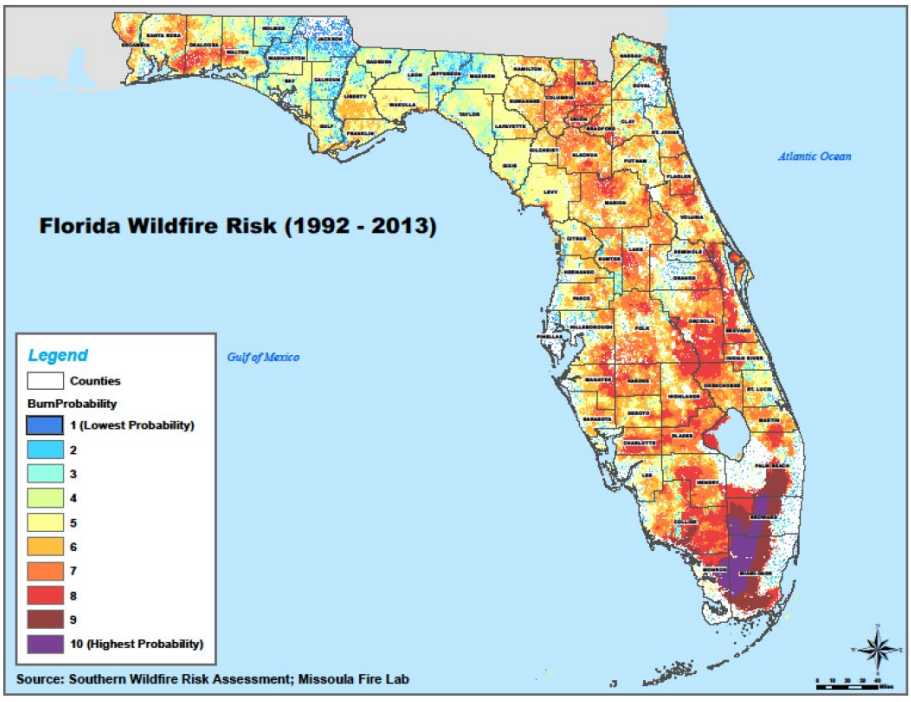


Figure VI.19: Wildfire Risk;
Source: 2018 Florida State Enhanced Mitigation Plan

Based upon Florida Forest Service data as presented in the 2011 Polk County CWPP, there were a total of 7,746 wildfires in Polk County from 1980-2010. Sixty-six percent of the wildfires were less than 10 acres in size and 93 percent were less than 100 acres in size. During that 30-year period, there were two wildfires that were larger than 5,000 acres in size. During that same period, a total of 263,439 acres burned, which averages to approximately 8,781 acres burned per year. Based upon historical wildfire trends, it is highly likely that Polk County will experience multiple wildfires of less than 100 acres in size during any given year. Officials expect the total number of acres burned in a year should be less than 10,000 acres.

Vulnerability Summary

During drought conditions, much of the conservation lands and vegetated phosphate mining lands are at risk of wildfires. Wildland Urban Interface (WUI) areas are vulnerable to wildfires and can cause significant property damage. The US Forest Service mapped the WUI of the United States in 2010, showing WUI areas and the intermix areas, as well as areas that were Non-WUI and vegetated, and areas that were non-vegetated or agriculture. The 2010 data and analysis is the most recent. The WUI analyzes land and provides a risk level from low to high. Appendix E includes the Southern Wildfire Risk Assessment Report for Polk County and the 2011 Polk County Community Wildfire Protection Plan.

The agricultural industry is vulnerable to the impacts of wildfire. The County's special needs populations are vulnerable in terms of ability to evacuate and impacts from smoke. The most susceptible areas for wildfires in Polk County are the lands along the Lake Wales Ridge and in the Green Swamp.

Lake Wales Ridge

The Lake Wales Ridge, running north and south in eastern Polk County, is home to the cities of Frostproof, Lake Wales, Dundee, Lake Hamilton, Haines City and Davenport. The Heart of Florida Hospital is located on the Ridge in the Haines City/Davenport area south of Interstate 4. Many residential subdivisions have developed along the Ridge especially in northeastern Polk County. In addition to these more urban areas, the Ridge, due to its sandy and permeable soils, is home to citrus groves and extensive agricultural operations. The Avon Park Air Force Range is also located along the Ridge. Management through prescribed burning is essential in these areas to control wildfires.

Green Swamp

The Green Swamp, located in northern Polk County along the Interstate 4 corridor is vulnerable to wildfires during dry seasons. Much of the Green Swamp is undeveloped, however the cities of Polk City, Lakeland, and Auburndale extend into this area. Although the Green Swamp is mostly undeveloped, it is home to sand mining operations and some agricultural operations. As with the Lake Wales Ridge, management through prescribed burning is essential in this area to control wildfires.

Because much of the County is undeveloped green space, vulnerability is moderate to high. If a major wildfire were to occur, the most significant impact would be the loss of the green space. Protection of most populated areas is at the cost of the forest. Each jurisdiction is at risk of a wildfire as indicated in the following table.

TABLE VI-12:
LEVEL OF RISK – WILDFIRE

Jurisdiction	Level of Risk
Auburndale	Low - Medium
Bartow	Medium – High
Davenport	Low – Medium
Dundee	Medium – High
Eagle Lake	Low – Medium
Fort Meade	Low – Medium
Frostproof	Low – Medium
Haines City	Low – Medium
Highland Park	Medium – High
Hillcrest Heights	Medium – High
Lake Alfred	Low – Medium
Lake Hamilton	Low – Medium
Lake Wales	Low – Medium
Lakeland	Low – Medium
Mulberry	Low – Medium
Polk City	Medium – High
Winter Haven	Low – Medium
Unincorporated Polk County	Low – Medium
Polk County Public Schools	Low – Medium

Risk Assessment

Wildfires impact residents and businesses by threatening physical structures and infrastructure. However, smoke can also have widespread impacts. This represents personal as well as economic loss, depending on the impact area. Uncontrolled wildfires can cause severe economic impact to the agricultural industry depending on their location.

With more than 300,000 residential and commercial parcels in the moderate to high rated areas of the County, the potential dollar losses may exceed $29 billion. However, according to US Forest Service statistics, the average major fire burns approximately 210 acres or a little over one-third of a square mile, so the expected costs would be significantly less. As the population continues to grow, the number of residents living in or near wildland areas will also continue to increase. The threat of wildfire will increase as the urban areas extend into previously forested areas, or into or adjacent to forested areas not prescriptively burned on a regular basis. Officials predict the number of human-caused fires to increase as the population living in WUI areas continues to grow (Appendix A), and as management of natural areas within the urban area with prescribed fire or other vegetation management does not occur.

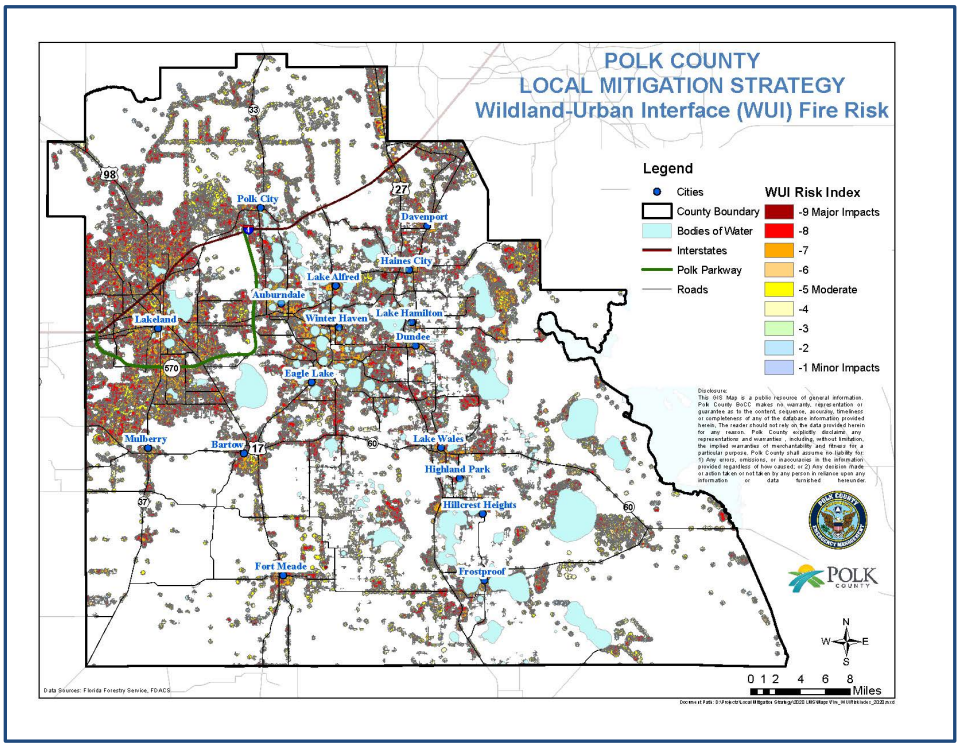


Figure VI.20: Wildland-Urban Interface Fire Risk;
Source: Florida Forest Service

The tables below list each municipality's potential dollar amount exposure to certain levels of wildfire hazard. Exposure does not dictate a specific damage estimate because it is impossible to determine the amount of damage that a wildfire will cause. The tables demonstrate the building values by minor, moderate, or major WUI risk. WUI risk boundaries do not follow parcel lines, therefore the exposure valuations cannot be combined as parcels may be included in more than one WUI risk designation.

TABLE VI-13:
WILDFIRE EXPOSURE AND POTENTIAL LOSSES – POLK COUNTY

Use	Minor	Moderate	Major
Agriculture	$155,426,458	$221,427,266	$14,406,999
Residential	$637,845,468	$4,241,552,886	$3,028,436,987
Commercial/ Industrial	$1,631,866,262	$2,697,121,267	$1,467,173,326
Government/ Institutional	$579,538,941	$1,570,939,457	$870,401,322
Miscellaneous	$19,922,624	$29,627,190	$1,928,368
Total	**$3,024,599,753**	**$8,760,668,066**	**$5,382,347,002**

TABLE VI-14:
WILDFIRE EXPOSURE AND POTENTIAL LOSSES –MUNICIPALITIES

Jurisdiction	Acreage				Total Structure Value ($)
	Minor	Moderate	Major	Total	
Auburndale	397.49	1,255.10	3,454.89	5,107.48	750,880,704
Bartow	656.36	2,594.23	4,724.12	7,974.71	717,460,506
Davenport	68.55	319.73	994.34	1,382.61	197,504,405
Dundee	128.79	285.94	1,328.50	1,743.23	133,716,012
Eagle Lake	21.18	154.03	596.35	771.55	97,442,231
Fort Meade	161.27	428.02	1,585.84	2,175.14	116,267,762
Frostproof	242.85	607.99	1,235.10	2,085.95	128,772,209
Haines City	420.58	1,144.74	4,950.70	6,516.02	885,221,847
Highland Park	2.66	57.86	215.65	276.16	12,025,167
Hillcrest Heights	2.91	8.97	129.37	141.25	14,811,298
Lake Alfred	289.01	684.42	1,627.05	2,600.48	179,156,481
Lake Hamilton	82.54	218.63	666.36	967.53	68,816,265
Lake Wales	373.78	1,501.98	4,498.36	6,374.12	644,959,486
Lakeland	1,289.74	5,351.46	19,855.29	26,496.49	5,062,692,670
Mulberry	94.46	557.12	1,098.53	1,750.11	132,988,123
Polk City	163.83	393.08	1,007.38	1,564.29	97,731,444
Winter Haven	468.36	2,247.74	9,033.17	11,749.27	1,799,690,549
Total	**4,864.37**	**17,811.03**	**57,000.99**	**79,676.39**	**11,040,137,159**

Human-Caused Hazard Vulnerability and Risk

Cyber-Attacks and Terrorism

Extent

The possibility exists in Polk County for terrorism, sabotage, and cyber-attacks. The County's vulnerability to this hazard is medium, and the LMS Working Group considers this hazard a threat to the County. The City of Bartow has a slightly higher vulnerability to terrorism since it is the County seat.

The warm temperatures, high rate of sunshine (UV exposure), and rainfall in Polk County make this area a less favorable target for biological or chemical terrorism than many other areas of the United States. Polk County's population is dispersed and the transportation system infrastructure is highly dependent upon individual vehicles. These features make Polk County a less desirable target for transportation system or conventional type (bomb-related) terrorist acts.

Vulnerability Summary

Crime/terrorism hazards can damage or impair the County's infrastructure, disrupt commerce, and possibly result in large-scale health emergencies, disease outbreaks, and/or epidemics. Public awareness of terrorist incidences worldwide has increased since 2001, and the percentage of terrorist events resulting in fatalities continues to grow. Government buildings, large market sectors, critical infrastructure, tourist attractions, and large-scale events are all prime targets for terrorist organizations. Additional vulnerabilities include:

- Transportation Systems – highways, railways, waterways, and airports are vital to the transportation of materials, goods, services, and people;
- Population – an attack on a large population garners large media attention;
- Workplace/School – a mass attack on a school or workplace garners large media attention;
- Industry – large manufacturers and companies house hazardous materials. Disruption of these facilities can have an economic impact and cause physical damages to property and loss of lives due to the large volume of hazardous materials housed;
- Utilities – large dependency on telecommunications, power, water, wastewater, and pipeline services for daily activities and operations;
- Government Buildings – attractive to deliver a political statement; and
- Entertainment/Recreation – anywhere that attracts large populations garners large media attention.

Risk Assessment

Although the LMS Working Group recognizes jurisdictions are vulnerable to terrorism and cyber-attacks, there is a lack of data to quantify the vulnerability.

Dam/Levee Failures

Extent

According to the 2018 Florida Enhanced State Hazard Mitigation Plan, Polk County has the highest number of dams in the State. According to information available through the National Inventory of Dams, most structures (94.1 percent) in the County are earthen dams. The private sector owns most of the dams (93.0 percent). Many water control structures in lakes are lock systems. Mining operations that have dams in Polk County are in the southwestern portion of the County. In 1967, a dam failure occurred at a phosphate mining operation in Fort Meade that resulted in the release of 250,000 m^3 of phosphatic clay slimes and 1 million m^3 of water, causing a fish kill in the Peace River. In 1971, a clay pond dam failed releasing 9 million m^3 of clay water, which caused a large fish kill in the Peace River. In 1994, a dam failure occurred at a phosphate mining operation releasing 6.8 million m^3 of water from a clay settling pond, the majority of which remained on site.

According to National Inventory of Dam information, the 307 dam/levee structures in the County have an average of 7,412 acre-feet maximum storage, which is total storage space in a reservoir below the

maximum attainable water surface elevation, including any surcharge storage. The structures have an average of 9,457 acre-feet of normal storage, which is the total storage space in a reservoir below the normal retention level, including dead and inactive storage and excluding any flood control or surcharge storage. These structures have a total drainage area of 2,493 square miles.

Vulnerability Summary

The frequency of failure for dams in Polk County is unknown. Life spans for earthen dams generally exceed 50 years. Of the structures with a listed completion date, approximately 32 percent of the structures in the County are less than 50 years old (Figure VI.23).

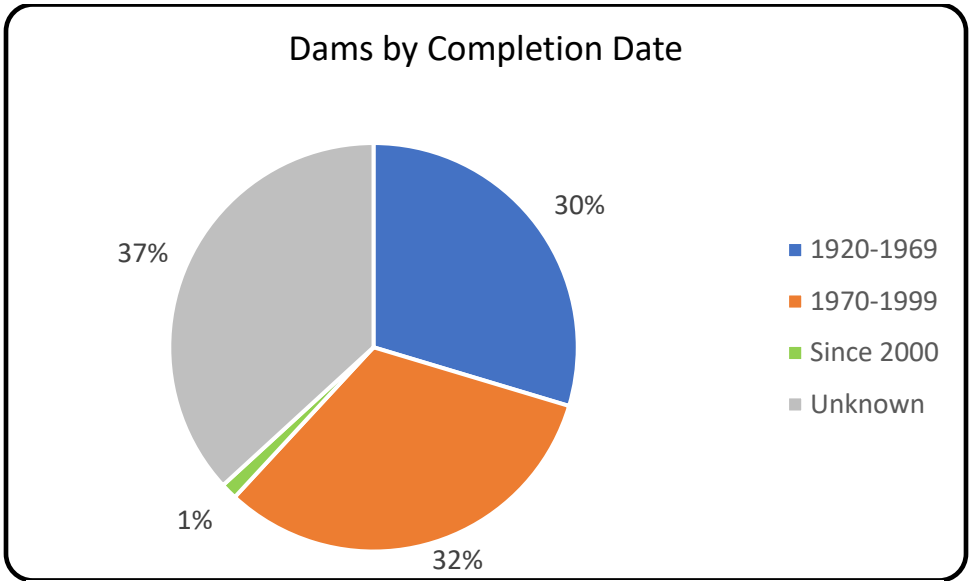


Figure VI.21: Year Dam/Levee Structure Completed;
Source: USACOE National Inventory of Dams

The extent of damages the County would suffer depends on the exact location of a dam breach and the degree of the failure. Due to their isolated locations, there is little likelihood that the failure of a clay-settling pond would adversely impact county residents. Based on the general location map (Figure 5.39), and information from the Statewide Critical Facilities Inventory, Table VI-15 includes information relating to the assets located in the vicinity of the dam locations where dam failure could cause impacts.

TABLE VI-15:
SPECIFIC ASSETS VULNERABLE TO DAM/LEVEE FAILURE

Asset Type	Count		Asset Type	Count
Community Center	1		Private Schools	2
Electric Substations and Power Plants	18		Public Schools	7
Faith Based Facilities	11		Public Water Supply	40
Fire Stations	4		Shelters	4
Mobile Home/RV Parks	20		Solid Waste Facilities	8
Police Stations	2		Wastewater Facilities	28

The National Inventory of Dams includes a determination as to the downstream hazard potential for 261 structures in Polk County. The National Inventory of Dams identifies dams by their hazard risk of low, significant, and high.

- Low hazard: A dam where failure or mis-operation results in no probable loss of human life and low economic and/or environmental loss. Losses are principally limited to the owner's property.
- Significant hazard: A dam where failure or mis-operation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities or impact other concerns. These dams are often located in predominantly rural or agricultural area but could be located in areas with population and significant infrastructure.
- High hazard: A dam where failure or mis-operation will probably cause loss of human life.

Figure VI.24 illustrates the percentage of dam structures based on their classification of downstream hazard potential throughout the County.

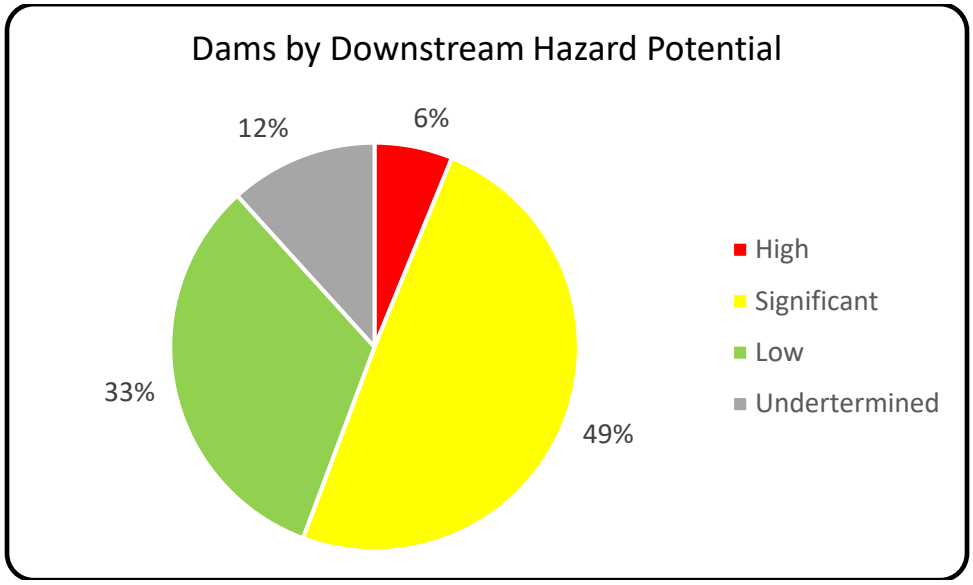


Figure VI.22: Dams by Downstream Hazard Potential;
Source: USACOE National Inventory of Dams

Most dams in Polk County with a high hazard designation are located in isolated areas of the County with no community assets, critical facilities, or infrastructure that a dam breach would impact. Many of the dams are remnant mining ponds which have dried up. The remaining dam is located north of SR 60 between Bartow and Mulberry. Failure of this dam could potentially impact a railroad, SR 60, and a few industrial properties located between the dam and SR 60 through flooding.

Risk Assessment

Section 62-672 Florida Administrative Code and Section 373, Florida Statutes, govern the construction and safety of dams and levees in Florida. According to the Florida Department of Environmental Protection

(FDEP), agency personnel at the State, regional, and local levels, as related to their respective regulatory programs, and private dam owners, conduct dam inspections in Florida. Oversight for phosphate mining and similar industrial impoundments is primarily the responsibility of FDEP. Other dams generally fall within the purview of the US Army Corps of Engineers, the State's five regional water management districts, or local government agencies.

Although the LMS Working Group recognizes that jurisdictions are vulnerable to human-caused hazards, there is a lack of data to quantify the vulnerability.

Epidemics

Extent

A disease outbreak takes place when a disease occurs in greater numbers than expected in a community or region or during a season. An outbreak may occur in one community or even extend to several countries. It can last from days to years.

Two of the major industries in Polk County for many years have been cattle ranching and citrus production. Eastern equine encephalitis threatened the large animal population (cattle, horses, etc.) in 1992. In the past, several pests and diseases have threatened the citrus industry (Mediterranean fruit fly (1997) and citrus canker (2005–06). Citrus greening and black spot are diseases that are affecting the citrus industry and continuing to spread through Polk County. Appendix A includes the extent of citrus canker and citrus greening impacts in Polk County.

Pandemics are large-scale outbreaks of infectious disease that can greatly increase morbidity and mortality over a wide geographic area and cause significant economic, social, and political disruption. Evidence suggests that the likelihood of pandemics has increased over the past century because of increased global travel and integration, urbanization, changes in land use, and greater exploitation of the natural environment (Jones and others 2008; Morse 1995). Pandemics can cause economic damage through multiple channels, including short-term fiscal shocks and longer-term negative shocks to economic growth. Individual behavioral changes, such as fear-induced aversion to workplaces and other public gathering places, are a primary cause of negative shocks to economic growth during pandemics. Pandemic mitigation measures can cause significant social and economic disruption.

Drug overdose deaths continue to impact communities in the United States. From 1999 to 2017, more than 702,000 people died from drug overdoses. In 2017, more than 70,000 people died from drug overdoses, making it a leading cause of injury-related death in the United States. Sixty-eight percent of those deaths involved a prescription or illicit opioid. On average, 130 Americans die every day from an opioid overdose. The figure below shows the opioid deaths per 100,000 population for Polk County, Florida, and the United States.

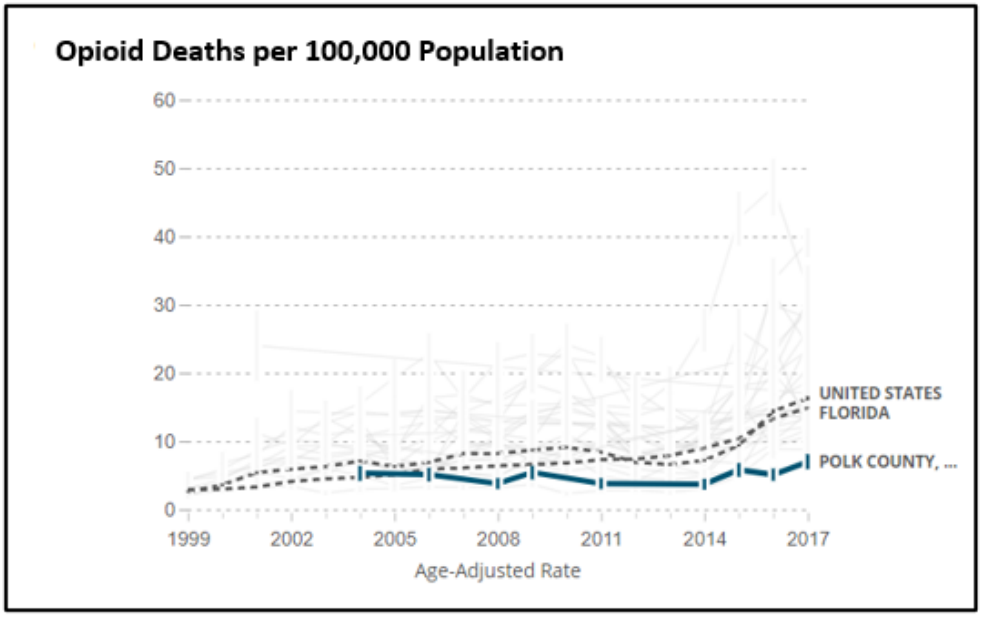


Figure VI.23: Opioid Death per 100,000 Population;
Source: Center for Disease Control and Prevention

Vulnerability Summary

Agriculture incidents pose a medium threat to Polk County. Consequences noted for an agriculture incident include: economic loss; quarantine of livestock; infectious disease; disposal of diseased livestock/agriculture stock; mass feeding; mass care; and mass casualty.

It is impossible to determine a jurisdiction's vulnerability; however, it is reasonable to claim that every jurisdiction is somewhat vulnerable to epidemic outbreaks.

Risk Assessment

A loss estimation is difficult to determine because of many unknown variables, but it is reasonable to claim that losses could range from minimal to extreme, depending on the epidemic and the magnitude.

Hazardous Materials Incidents

Extent

There are numerous hazardous materials facilities and plants throughout Polk County. There are hazardous materials located in minor quantities at schools, hospitals, and some of the telecommunication facilities throughout the county. The Local Emergency Planning Committee (LEPC) has an aggressive hazardous materials inspection and cataloging program. The LEPC places the information collected from the facilities into a statewide system for easy access by emergency responders. The Polk County Emergency Operations Center monitors planning and training activities, spills, chemical releases, and hazardous materials events. Of the numerous hazardous materials incidents reported statewide each year, fewer than one percent have resulted in fatalities, fewer than four percent have resulted in injuries, and fewer than six percent have resulted in evacuation. Hazardous materials incidents can occur anywhere there is a road, railroad, or fixed facility storing hazardous materials. The entire County is at risk

to an unpredictable incident of some type. Most incidents are small and confined to a relatively localized area.

The maps in Appendix A illustrate the location of hazardous materials facilities and the potential locations for hazardous materials incidents at rail crossings.

Vulnerability Summary

Vulnerability to hazardous materials releases (including wastes), whether onsite or in route, is difficult to determine due to the type and amount of materials released, location, weather, and other variables. To determine the vulnerability of the County to potential hazardous material incidents, it is necessary to determine the "vulnerable zone" or the area of each facility using or storing extremely hazardous substances. Due to the specificity of each hazardous material release, it was not possible to determine a comprehensive vulnerable zone or population exposure for Polk County.

Nationwide, there are more transportation accidents involving hazardous materials and wastes than those that occur at fixed facilities. Transportation accidents can occur on roadways, railways, waterways, in the air, and within pipelines. In addition, the numbers of large and small quantity generators are significant, and they correlate with the ranges of services and manufacturing within the County's economy. These generators register with FDEP and have control plans in place in accordance with permit procedures. The County can address spills and accidental releases. Officials expect the number of generators and the quantity and types of materials handled to increase proportionately with population and economic growth.

Risk Assessment

Hazardous materials incidents have the potential for loss of life, injury, damage to physical structures, and damage to the environment including drinking water. Businesses and individuals incur financial losses when officials close roads due to hazardous materials incidents.

Transportation Incidents

Extent

Transportation incidents include interactions between vehicles, bicyclists, pedestrians, trains, and airplanes. The use of golf carts on roads and the use of rental e-scooters are on the rise. The Smart Growth America's Dangerous by Design 2019 document shows Lakeland-Winter Haven with the fifth highest pedestrian danger index in the country. Municipalities are experiencing problems with users littering the sidewalks with e-scooters, which can impede the safe flow of traffic. All municipalities in the County adopted the complete streets policy to address the interaction of all potential users of the roadways. The Polk County Transportation Planning Organization and several municipalities are working on an intelligent transportation system and advanced technology to prepare for the future role of Autonomous, Connected, Electric, and Shared vehicles (ACES).

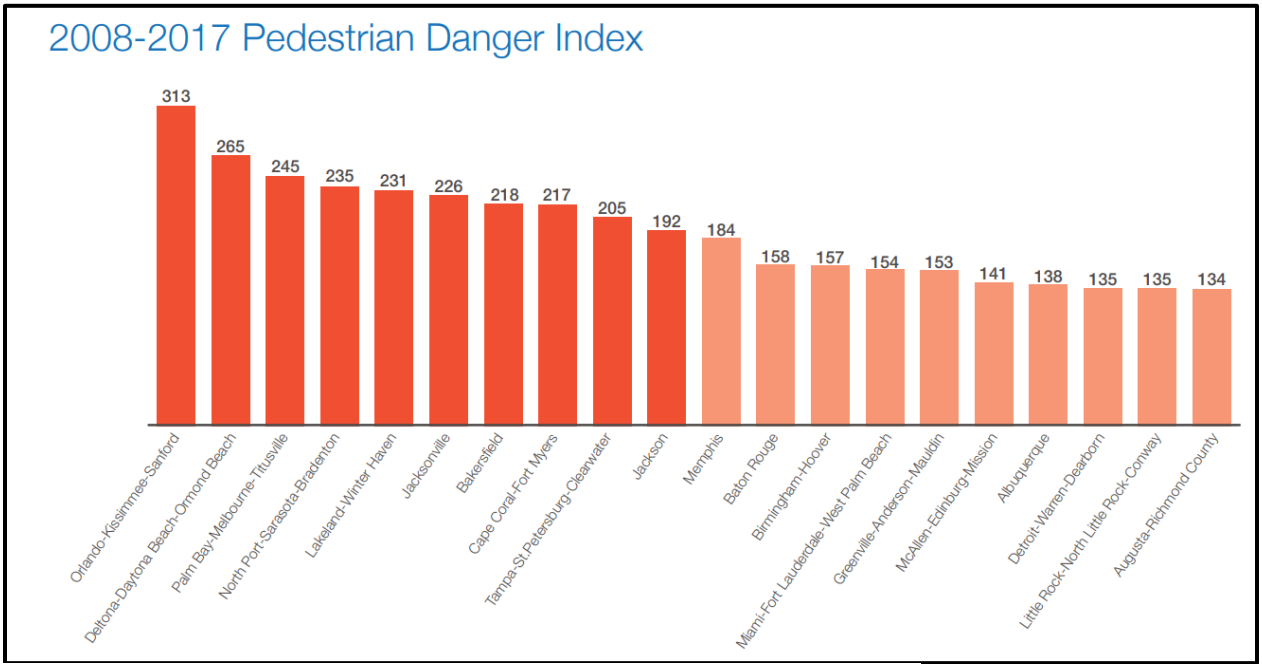


Figure VI.24: 2008-2017Pedestrian Danger Index;
Source: Smart Growth America

Vulnerability Summary

Vulnerability to transportation system accidents is associated with the highway and rail systems that run through Polk County (see maps Appendix A). According to Smart Growth America, fatal crashes involving pedestrians disproportionately represent older adults, people of color, and people walking in low-income communities. Individual community and population center vulnerabilities to this hazard are dependent upon location. Maps in Appendix A illustrate the locations of pedestrian and bicycle injuries and fatalities.

Risk Assessment

Transportation incidents impact residents and business by potential loss of life and injury and damage to physical structures. There is a financial loss to businesses and individuals as transportation incidents close roads. The risk of transportation incidents is increasing as people are more distracted by their phones and digital devices and paying less attention. The work with ACES will disrupt and alter mobility and transportation.

Critical Facilities

Critical facilities are located throughout the County. Shelters and fire/rescue make up the largest percentage of critical facilities. Table VI-16 includes a breakdown of critical facilities by type.

TABLE VI-16:
CRITICAL FACILITIES

Land Type	Percent of Total
Electric Powerplants and Substations	17.84%
Emergency Operation Centers	0.74%
EMS	3.72%
Fire/Rescue	24.54%
Hospitals - Acute Care	2.23%
Local Government Facilities	0.74%
Police	11.52%
Shelter	28.62%
State Government Facilities	10.04%

The majority of the critical facilities are located outside the Special Flood Hazard Area (95.6%).

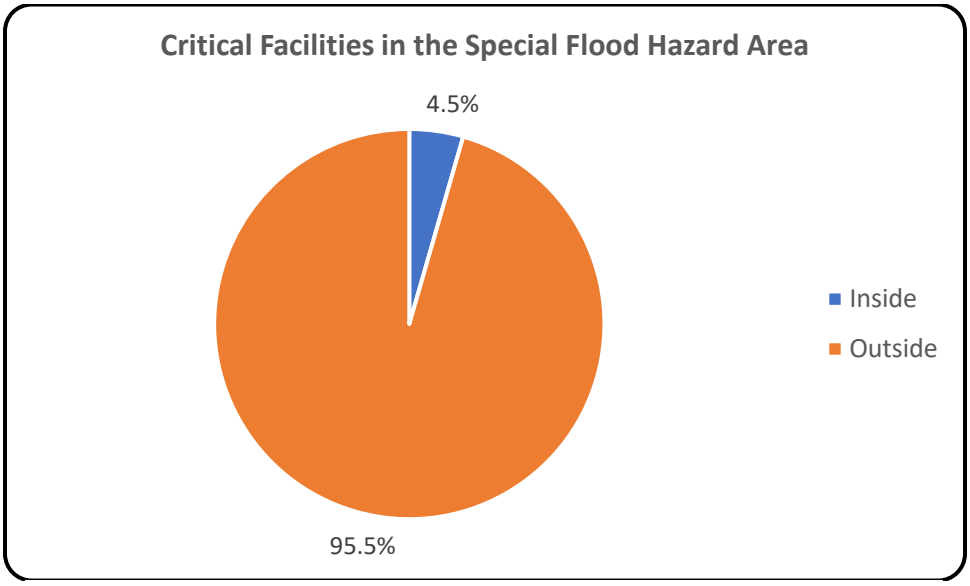


Figure VI.25: Percentage of Critical Facilities in the Special Flood Hazard Area

The majority of the critical facilities are located in Sinkhole Area III (84.8%). Sinkhole Area Type I includes the smallest percentage of critical facilities (1.1%).

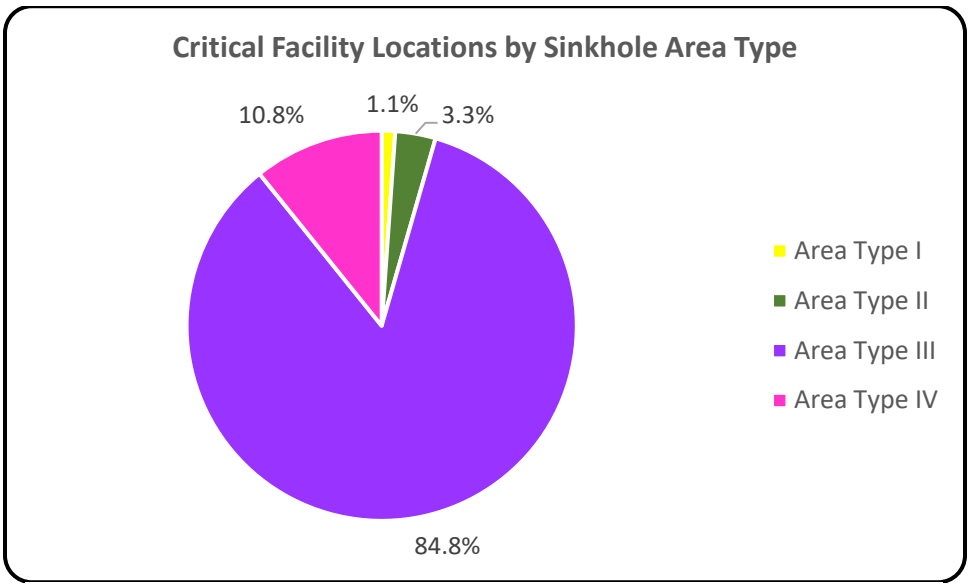


Figure VI.26: Percentage of Critical Facilities by Sinkhole Area Type

Approximately 68 percent of the critical facilities in the county are in the Wildland Urban Interface (WUI). Of the critical facilities located in the WUI, approximately 80 percent of them are in the major zone. Information from the Southern Wildfire Risk Assessment (SWRA) web Portal (SouthWRAP) is the basis for the WUI.

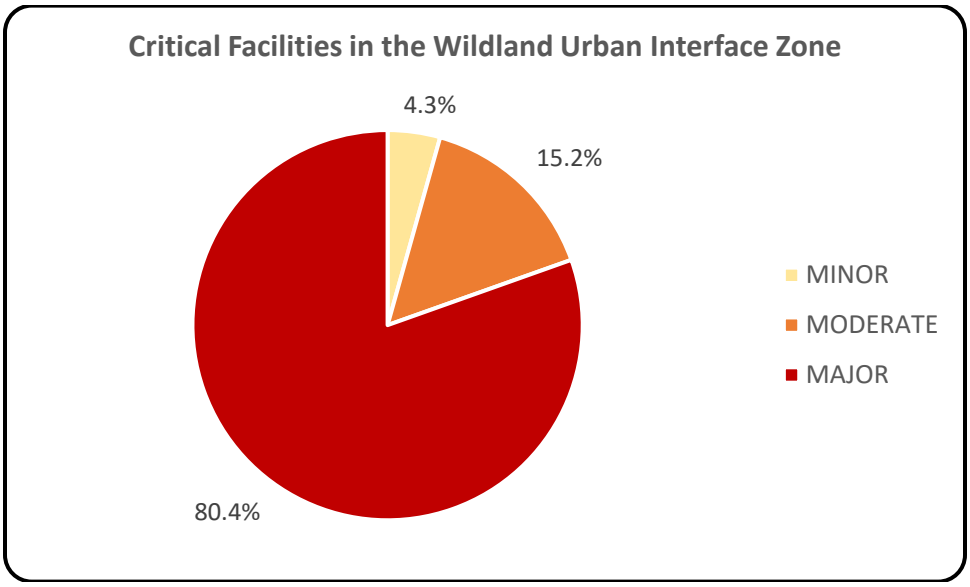


Figure VI.27: Percentage of Critical Facilities by Wildland Urban Interface Zone

Repetitive Loss

The LMS does not include the database of repetitive loss properties because of the specific address and personal information that is associated with the information. Individuals may request specific information from the appropriate jurisdictions directly, or through the NFIP at FEMA. Appendix A includes a map related to repetitive loss properties. Approximately 52 percent of the properties in Polk County are in the High Hazard Area.

While repetitive loss properties refer to flood loss, these properties are also located in other hazard areas. As illustrated in the following figures, most of the repetitive loss properties are in the Type III sinkhole area (90.5%) with the least in the Type IV sinkhole area. All but three properties are in the WUI. Of the properties located in the WUI, approximately 89 percent of them are located within the major WUI zone. Information from the Southern Wildfire Risk Assessment (SWRA) web Portal (SouthWRAP) is the basis for the WUI.

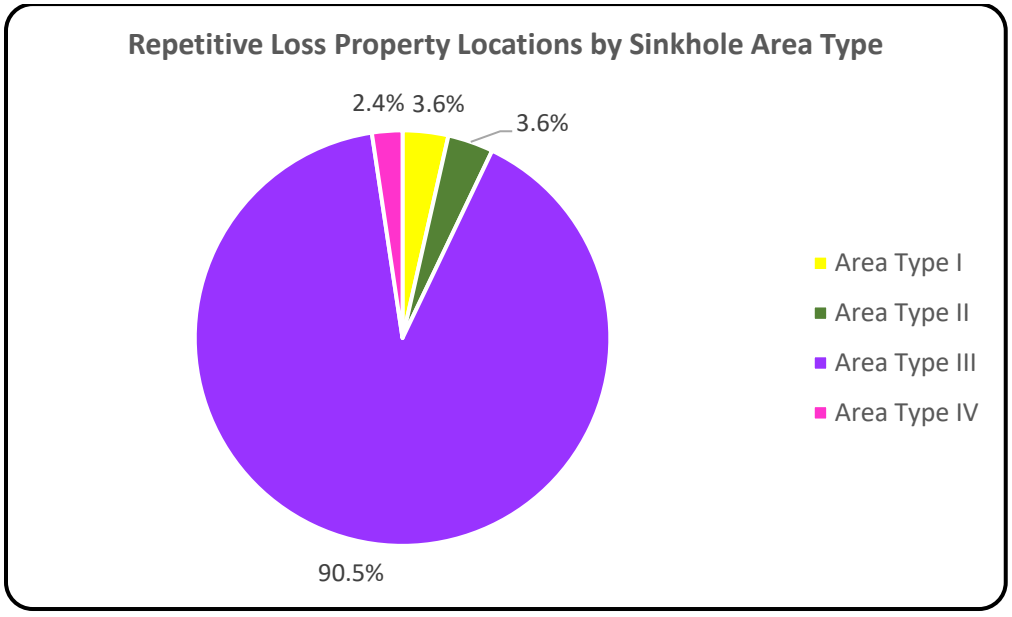


Figure VI.28: Percentage of Repetitive Loss Property Locations by Sinkhole Area Type

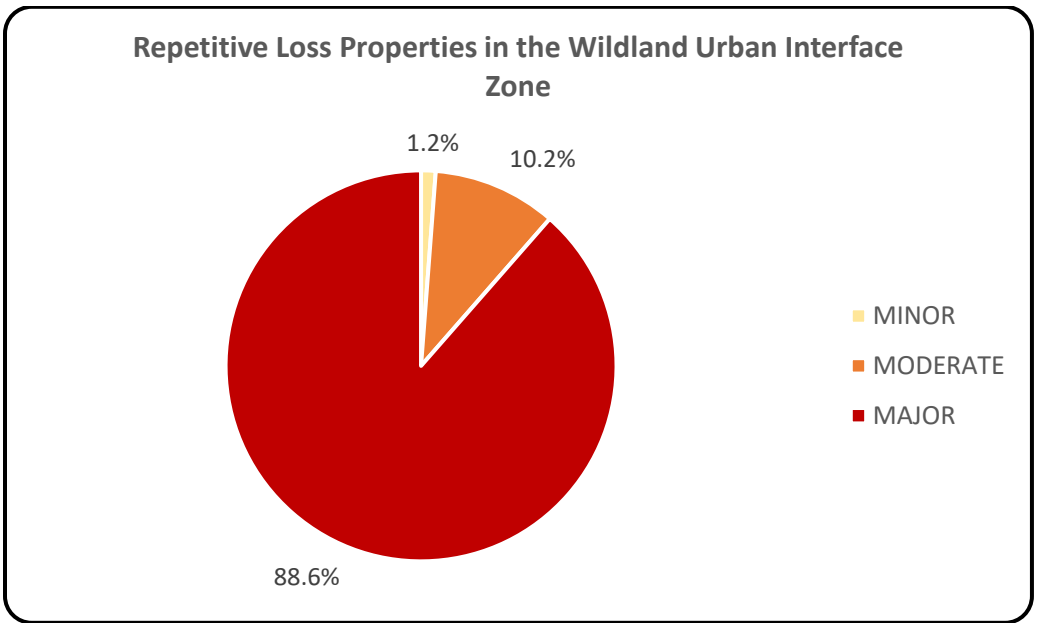


Figure VI.29: Percentage of Repetitive Loss Property Locations by Wildland Urban Interface Zone

Municipalities with repetitive loss properties are trying to eliminate or reduce the risks of future flooding to those properties through various mitigation techniques including outreach methods. Each municipality sends a notice to every owner of a repetitive loss property, soliciting interest and participation in various grant programs, to mitigate their property from future flood losses. The municipality prioritizes each interested property owner that responds to the solicitation utilizing the prioritization guidelines, produced by the program in which they apply. Currently, each municipality maintains that information.

The LMS supports all projects submitted for alternative funding regardless of the authority, and the LMS Working Group scores each project utilizing the LMS project scoring criteria. Depending upon the grant program or alternative funding source, the programs may have specific prioritization process, which may compliment or negate the local prioritization. Each municipality's repetitive loss property coordinator maintains list of interested property owners.

Land Use Trends and Potential Loss

The LMS Working Group recognizes the way people utilize land, especially land within known hazard-prone areas, has a significant effect on community vulnerability. Residential or industrial development areas may be more susceptible to disaster-related damages than others. The LMS includes a municipal-specific analysis because individual municipalities have the planning and legal control over land use policy.

All municipalities reported they were growing either moderately or rapidly, and except the Town of Hillcrest Heights and the Village of Highland Park, all are participants in the NFIP. Pressure for development to locate in wetland areas continues to be an ongoing issue in the County. The LMS Working Group recognizes that its efforts to identify the areas at risk from various hazards is essential to guide the use of land to minimize future vulnerabilities to disaster. When needed and desired, a participant may

propose modifications to the plans, ordinances, codes, and similar policies as mitigation initiatives for incorporation into the LMS.

Changes in future development influence the peak discharge of floods by modifying how rainfall is stored on and/or run off the land into tributaries. In undeveloped areas such as forests and grasslands, rainfall is collected and stored on vegetation, in the soil column, and in surface depressions. When this storage capacity is filled, runoff flows slowly over land or as subsurface flow. In contrast, urban areas have less capacity to store rainfall, since development covers much of the urban land surface by roads and buildings. Construction of these roads and buildings often involves removing vegetation, soil, and depressions from the land surface. Development replaces the permeable soil by impermeable surfaces such as roads, roofs, parking lots, and sidewalks that store little water, reduce infiltration of water into the ground, and accelerate runoff to ditches and streams. Even in suburban areas, where lawns and other permeable landscaping may be common, rainfall can saturate thin, compressed soils and produce overland flow, which runs off quickly. Dense networks of ditches and culverts in cities reduce the distance that runoff must travel overland or through subsurface flow paths to reach streams and rivers.

Changes in the future development as described above, in conjunction with the projected increase in population, have the potential to put more homes and lives at risk due to flooding. Some of these areas are in existing Special Flood Hazard Areas. Future land use planning considers existing Special Flood Hazard Areas, as well as areas known to exhibit flooding not identified on the FEMA maps, which preserves many areas that provide natural floodplain functions, including existing Special Flood Hazard Areas.

County and municipal staff work with developers to avoid and minimize impacts to wetlands and preserve wetlands and wetland buffers as much as possible. In most cases where minimal impacts to wetlands are allowed, on-site mitigation is preferred. These natural wetlands or mitigated features provide valuable stormwater attenuation, among other values to our developed spaces.

Life and Safety

In Florida, common hazards to life safety include coastal and inland flooding, tropical storms, hurricanes, and lightning. Deep, fast flowing, or rapidly rising floodwaters can cause physical injury and loss of life. A mere 6 inches of moving water can sweep a person away. The risk for drowning and physical injury increases when floodwaters carry debris. Floodwaters can also hide other hazards for wading pedestrians, such as manhole openings where flood flow has lifted the covers. Approximately 6 inches of flowing water can move vehicles and wash away roads. Downed power lines or other energized systems in the water can cause electrocution. In addition, stresses to gas lines can lead to a natural gas leak, further putting lives at risk. Flooding from rainfall itself will not warrant an emergency evacuation of many residents and visitors. However, residents may evacuate as result of rising floodwater overflow.

Flooding is one of the most devastating natural disasters in the world. Having a warning system and evacuation plan will reduce injuries and loss of life. A specific evacuation procedure, including zones, routes, shelters, and means of communication helps reduce confusion for residents and visitors, and provide a smooth evacuation out of high-risk areas. Polk County is a StormReady community and has several programs to better prepare the community for these events. A Storm Ready community must:

- Establish a 24-hour warning point and emergency operations center;
- Have more than one way to receive severe weather warnings and forecasts and to alert the public;

- Create a system that monitors weather conditions locally;
- Promote the importance of public readiness through community seminars; and
- Develop a formal hazardous weather plan, which includes training severe weather spotters and holding emergency exercises.

In addition, Polk County utilizes Alert Polk, which is a critical communications system shared with most public safety operations across the State of Florida to inform county residents about public safety threats and concerns. During situations which may affect the health, safety and welfare of Polk County residents, designated officials send out messages to telephone numbers and email addresses within the affected geographic area. When Alert Polk sends a message, it provides specific information about the current announcement. Topics of emergency notifications include:

- Tornadoes/Severe Weather;
- Mandatory Evacuations;
- Boil Water Orders;
- Gas Leaks;
- Sexual Predator Relocation Notices;
- Critical Law Enforcement Notifications;
- Hurricanes; and
- Hurricane Recovery Information.

Table VI-17 describes the potential impacts to life safety of these and the identified hazards from Section V.

TABLE VI-17:
POTENTIAL IMPACTS TO LIFE SAFETY

Hazard	Potential Impact
Atmospheric Hazards	
Extreme Temperatures	Extreme heat can cause discomfort and may increase the risk of accidents due to muscle cramps, heat exhaustion, and the worst is death. Temperatures that are too low can increase the risk of accidents due to health problems arising from the cold including frostbite and hypothermia.
Fog	Fog, particularly when dense, can be hazardous to drivers, mariners, and aviators. Fog contributes to numerous travel accidents every year. Restrictions in visibility resulting from fog can also impact takeoff and landing procedures and requirements for pilots, and can be the cause of weather-related aviation delays.
Hurricanes/ Tropical Storms	Hurricanes and tropical storms may damage or destroy residential, commercial, and public buildings, as well as critical infrastructure such as transportation, water, energy, and communication.
Severe Storms and Tornadoes (Hail, Lightning, and Thunderstorms)	All thunderstorms are dangerous and can be associated with several hazards. Heavy rains can lead to flash flooding events – one of the primary causes of death associated with thunderstorms. Lightning, causes fatalities and injuries each year. Lightning can also start building fires, damage

TABLE VI-17:
POTENTIAL IMPACTS TO LIFE SAFETY

Hazard	Potential Impact
	electrical equipment, and electrocute humans and livestock. High winds generated by thunderstorm can cause damage to homes, overturn vehicles, uproot or damage trees, or blow down utility poles causing wide spread power outages. Hail causes damage to crops and property each year and can injure people or animals left outdoors.
Geologic Hazards	
Subsidence and Sinkholes	Sinkholes can cause significant damage and pose a threat to safety when they occur along a highway or near homes and other buildings. If sinkholes are under or near a structure, they can destroy the structure's integrity. Formation of the sinkhole can also result in the plugging of underground drainage patterns and a lake can form in the newly formed depression area. One hazard associated with sinkholes is the possibility of health problems caused by chemicals and other materials contaminating the drinking water supply. Open sinkholes provide a direct connection between ground water surface water and any contaminants it carries.
Hydrologic Hazards	
Drought	Drought impacts come in a variety of forms. Examples of economic impacts include farmers who lose money because drought destroyed their crops or ranchers who may have to spend more money to feed and water their animals. Drought also affects the environment and society. Plants and animals depend on water, just as people do. Drought can shrink their food supplies and damage their habitats. Drought can also affect people's health and safety. Drought conditions can also provide a substantial increase in wildfire risk. Long periods of drought can equate to more wildfires and more intense wildfires, which affect the economy, the environment, and society in many ways such as by destroying neighborhoods, crops, and habitats.
Flood	Floodwaters have the potential to cause drowning. Floodwater carrying debris increases the risk for drowning and physical injury. Floodwaters can also hide other hazards for wading pedestrians, such as manhole openings where the flood flow lifts the covers.
Other Natural Hazards	
Climate Change	Climate change could threaten resources, as well as the goods and services they produce and the jobs and livelihoods of those who depend upon them. Climate change may make it harder and more expensive for many people to insure their homes, businesses, or other valuable assets in risk-prone areas, or preclude them from insurance altogether. Climate change will also likely affect tourism and recreational activities.

TABLE VI-17:
POTENTIAL IMPACTS TO LIFE SAFETY

Hazard	Potential Impact
Wildfire	In some cases, the resulting losses are extraordinary, causing hundreds of deaths, widespread damage to property and contents and significant impacts on the environment. More often, fires may cause a single casualty or affect a single home, though the effects are still highly significant to those affected and collectively are substantial.
Human-Caused Hazards	
Cyber-Attacks and Terrorism	Researchers have identified 57 different negative impacts that can result from cyber-attacks. They are split into the following categories: Physical/Digital; Economic; Psychological; Reputational; and Social/societal. Terrorism incidents can result in the loss of life, the destruction of property, excessive costs to law enforcement and emergency management services, and increased uncertainty in the markets.
Dam/Levee Failure	Dam failures and other incidents that have the potential to harm downstream populations and/or infrastructure. Leaking and collapsing tailings dams can result in long term environmental damage.
Epidemics	Infectious diseases can spread with extreme rapidity, threatening the health and life safety of regional communities or global populations. Outbreaks of epidemics can lead to costs on the health system, disruption of economic and other socially valuable activities, and decreases in trade.
Hazardous Materials Incidents	Hazardous material spills or releases can pose a risk to life, health, and property. An incident can force the evacuation of few people, a section of a facility, or an entire neighborhood or community, resulting in significant economic impact and possible property damage and loss of life. There is also the possibility of health problems caused by chemicals and other materials contaminating the drinking water supply.
Transportation Incidents	Transportation incidents can result in property damages; costs to emergency services; traffic delays; medical and rehabilitation care; lost productivity and disability compensation costs; and pain, suffering and grief.

Public Health

Of all hazards, flooding presents the most prevalent risk to public health. Floodwater is generally contaminated by various pollutants such as sewage, human and animal feces, pesticides and insecticides, fertilizers, oil, asbestos, rusting building material, and others. Prolonged flooding also provides breeding grounds for mosquitoes. Flooding exposes homes to mold and mildew and can cause flood victims to

contract upper respiratory diseases and trigger cold-like symptoms. Molds can grow in as little as 24 to 48 hours in wet and damp areas of buildings and homes not cleaned after flooding. Water infiltrating through walls, floors, carpets, toilets, and bathrooms can cause mold. Floodwaters can also contain dangerous animals such as alligators or snakes. Flooding can bring these animals typically found in rivers, creeks, and ponds onto normally dry land. Residences and visitors need to be careful, as these animals may be hard to see in the floodwaters. Flooding resulting from a tropical storm or hurricane can compromise the safety of water supplies and the integrity of sewage disposal, leading to threats of food borne and waterborne illness. Power line damage and power outages increase the risk of foodborne illness and electrocution. Storms can disrupt medical care; a major storm can leave victims isolated without water and medicines. Restoring medical care for individuals injured in the storm or whose care for chronic conditions lapsed when storms cut them off from services is a public health priority. A flood can also cause both emotional and physical stress. Exposure to extreme disaster events, including loss or injury of loved ones, home damage, or home destruction can pose a long-term psychological impact on victims. Vulnerable populations such as seniors, the disabled, or those with long-term illnesses are less able than others to cope with floods.

Economy and Top Employers

According to FEMA and PEW Charitable Trusts, flooding is the costliest and most common natural disaster in the U.S., claiming lives, inflicting financial losses on households and businesses, and straining the government agencies that provide flood response and relief. The closure of roads and public transportation services can prevent employees from getting to work and employers from providing goods and services. The closure of businesses can affect the economy due to loss of revenue, fixed costs, replacement costs, and other expenses. The top three employers for Polk County are the Polk County School Board, Publix Super Markets, and Lakeland Regional Health with 13,235 employees, 12,500 employees, and 5,575 employees respectively. Facilities serving these industries are located throughout the County. Tropical storms, hurricanes, flooding, and other hazards can quickly disrupt these services. Loss of business in such events would impact the economy of the Polk County community.

SECTION VII – MITIGATION PLAN

44 Code of Federal Regulations	
44 CFR §201.6(c)(3):	A mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.
44 CFR §201.6(c)(3)(i):	A description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.
44 CFR §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.
44 CFR §201.6(c)(3)(iii):	An action plan describing how the actions identified in paragraph (c)(2)(ii) of this section 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.
44 CFR §201.6(c)(3)(iv):	For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.

Introduction

The intent of the Polk County 2020 Local Mitigation Strategy (LMS) is to provide Polk County, its municipalities, and the Polk County Public Schools goals to serve as guiding principles for future mitigation policy and project administration. The LMS provides an analysis of mitigation techniques to meet those goals and reduce the impact of identified hazards. The LMS is comprehensive, strategic, and functional:

- *Comprehensive:* The LMS includes a thorough review of likely hazards and identification of far-reaching policies and projects intended to reduce future impacts of hazards, and to assist the County and jurisdictions in achieving compatible economic, environmental, and social goals.

- *Strategic:* The LMS ensures that policies and projects proposed for implementation are consistent with pre-identified, long-term planning goals.

- *Functional:* The LMS links proposed mitigation actions to identified hazards and assigns specific departments or individuals responsible for implementation with target completion deadlines. When necessary, the mitigation strategy identifies funding sources that may assist with project implementation.

The first step in updating the LMS is the identification of countywide mitigation goals and objectives. These represent broad statements participants achieve through the implementation of more specific mitigation actions. Actions include hazard mitigation policies and implementation strategies (such as the regulation of land in known hazard areas through a local ordinance), and mitigation projects that seek to address specifically-targeted hazard risks (such as the acquisition and relocation of a repetitive loss structure).

The second step involves identification, consideration, and analysis of available mitigation measures to achieve the identified mitigation goals. This is a long-term, continuous process sustained through development and maintenance of the LMS. The LMS Working Group will continue to consider alternative mitigation measures as it identifies future mitigation opportunities, as data and technology improve, as mitigation funding becomes available, and as LMS maintenance occurs over time.

The third step in updating the LMS is the selection and prioritization of specific mitigation actions for Polk County and its jurisdictions through the Mitigation Action Plan (MAP). The MAP represents an unambiguous and functional plan of action. The MAP is the most essential outcome of the mitigation planning process.

The MAP includes a prioritized list of proposed hazard mitigation actions (policies and projects) for Polk County and its jurisdictions and partners to carry out. Each mitigation action includes those departments or individuals assigned responsibility for implementation, potential funding sources, and an estimated target date for completion. This serves as an important tool for monitoring success or progress over time. The cohesive collection of actions listed in the MAP can serve as an easily-understood menu of mitigation policies and projects for local decision makers who want to quickly review the recommendations and proposed actions of the LMS.

In preparing the updated MAP, participants considered overall hazard risk and capability to mitigate the effects of hazards as recorded through the risk analysis process, and the ability to meet the adopted mitigation goals and unique needs of the community. The following factors serve as the basis for the prioritization of proposed mitigation actions:

- Benefits to the population;
- Health and safety considerations;
- Environmental impact;
- Consistency with other plans and programs;
- Reduced risk of future property damage;
- Support for essential or critical services;
- Probability of receiving funding for implementation;
- Feasibility of implementation;
- Community Rating System;
- Repetitive Loss Mitigation; and
- Benefit Cost Ratio (conducted prior to submitting a project for grant consideration).

Mitigation Goals and Objectives

The goal of local governments is to promote the public health, safety, and welfare of residents. The purpose of the LMS goals and objectives is to reduce or avoid long-term vulnerabilities to residents and infrastructure within Polk County.

The Goals and Objectives Subcommittee of the LMS Working Group reviewed and updated the goals and objectives of the LMS based on conditions and priorities in the County. The LMS Working Group adopted four goals and associated objectives to guide its work and focus the efforts and resources to reduce future hazard-related losses and damages. The Goals and Objectives Subcommittee identified Implementation strategies to help achieve goals and objectives. Unless specifically stated, the goals and objectives cover

multiple hazards and address the needs of all jurisdictions. Unless otherwise stated, the term "County", as used in the following goals and objectives, represents Polk County, its municipalities, and the Polk County Public Schools.

TABLE VII-1:
POLK COUNTY MITIGATION GOALS AND OBJECTIVES

GOAL 1:	**REDUCE THE LOSS OF LIFE, PROPERTY, AND WELFARE OF THE PUBLIC FROM THE EFFECTS OF NATURAL AND HUMAN CAUSED HAZARDS FROM ALL SOURCES, BUT ESPECIALLY HURRICANES, TORNADOES, FLOODING, OTHER SEVERE WEATHER EVENTS, CYBER ATTACKS, AND OTHER HUMAN CAUSED EVENTS.**
Objective 1.1:	Encourage the protection of cultural, economic, and natural resources from potential natural and human caused hazards.
Objective 1.2:	Continue to develop the capacity to mitigate, prepare, respond, and recover from all hazards.
Objective 1.3:	Efficiently manage all local disasters.
Objective 1.4:	Reduce the cost of disaster response and recovery.
Objective 1.5:	Ensure new development and redevelopment complies with all applicable Federal, State, and local regulations.
	IMPLEMENTATION STRATEGIES
1a.	Continue to engage additional local community stakeholders to participate in the LMS Working Group meetings.
1b.	Track mitigation projects by flood basin to see past, current, and future projects and compare to flooding data.
1c.	Continue to work to provide sufficient shelter space to satisfy in-County demand.
1d.	Maintain and improve existing drainage systems to regulate management of storm water runoff.
1e.	Protect the function of natural drainage features and surficial aquifer recharge areas.
1f.	Protect and preserve wetlands, floodplains, and riverine systems to reduce the County's exposure to hazardous incidents including flooding and work to maintain economic, aesthetic, and recreational values.
1g.	Integrate mitigation into existing structures during regular maintenance and replacement cycles.
GOAL 2:	**MAINTAIN A HIGH STATE OF PREPAREDNESS/COORDINATION TO MITIGATE AND RESPOND TO DISASTERS THROUGH PLANNING, EDUCATION, AND COORDINATION.**
Objective 2.1:	Optimize the effective use of all available resources by establishing public/private partnerships and encouraging intergovernmental coordination and cooperation.
Objective 2.2:	Prevent and/or minimize losses from disaster events through education and regulation.

TABLE VII-1: POLK COUNTY MITIGATION GOALS AND OBJECTIVES	
Objective 2.3:	Continue dissemination of flood information to the public, non-profit, and private sector.
Objective 2.4:	Support programs under the Emergency Planning and Community Right-To-Know Act.
Objective 2.5:	Promote awareness and preparedness through the distribution of information on hazards and measures to mitigate them.
Objective 2.6:	Increase the level of coordination of mitigation management concerns, plans, and activities at the municipal, County, State, and Federal levels of governments in relation to all hazards.
Objective 2.7:	Educate the private sector about mitigation concepts and opportunities.
Objective 2.8:	Coordinate effective partnerships between County and local jurisdictions for floodplain management and stormwater drainage.
Objective 2.9:	Work with government, nonprofit, and private sector entities to identify and implement opportunities for the incorporation of mitigation concepts and information into outreach efforts.
Objective 2.10:	Inform and educate the public, nonprofit, and private sector about potential hazards and property protection measures.
Objective 2.11:	Inform and educate the public, nonprofit, and private sector about the first response to disasters to promote better disaster preparation.
Objective 2.12:	Strengthen continuity planning for local government, businesses, and community partners to avoid significant disruptions of services.
IMPLEMENTATION STRATEGIES	
2a.	Utilize a widespread program of general information, media coverage, and participatory involvement to enhance public mitigation and engagement.
2b.	Educate departments and agencies to ensure continuity of operations and a full integration of mitigation management functions.
2c.	Provide information and education on new and emerging mitigation methods and products for new and retrofitting construction.
2d.	Coordinate with the Certified Emergency Response Team (CERT) across the County.
2e.	Host mitigation workshops to educate stakeholders and community members.
2f.	Promote mitigation measures county-wide through outreach and education.
GOAL 3:	**SUPPORT MITIGATION INITIATIVES AND POLICIES THAT PROTECT THE COUNTY'S CULTURE, COMMERCE, ECONOMY, TOURISM, RESIDENCES, TRANSPORTATION SYSTEMS, RECREATION, AND NATURAL RESOURCES.**
Objective 3.1:	Support land acquisition programs that reduce or eliminate potential future losses due to natural or human caused hazards or repetitive loss and that are compatible with the protection of natural or cultural resources.
Objective 3.2:	Continue to identify potentially vulnerable areas and support smart growth and development in Polk County.

TABLE VII-1: POLK COUNTY MITIGATION GOALS AND OBJECTIVES	
Objective 3.3:	Support restoration and conservation of natural resources wherever possible.
Objective 3.4:	Seek mitigation opportunities that reduce economic losses and promote responsible growth.
Objective 3.5:	Regulate and prioritize the construction and/or enhance the protection of critical facilities and infrastructure.
IMPLEMENTATION STRATEGIES	
3a.	Retrofit existing County and local facilities to withstand hazard impacts.
3b.	Participate in activities that will further the County and local government's ability to plan for and mitigate the impacts of future vulnerability.
3c.	Adopt policies that provide development standards to promote resiliency and reduce risk.
3d.	Adopt building codes leading to building design criteria based on site-specific evolving and future risk.
3e.	Identify mitigation projects that reduce risk to vulnerable populations that are at greater risk from hazards.
3f.	Maintain or improve critical evacuation routes.
3g.	Prioritize and retrofit existing critical facilities and infrastructure through capital improvement expenditures.
3h.	Perform risk assessments for hazards, including cyber security.
3i.	Continue to invite and work with critical facility stakeholders.
3j.	Identify and track mitigation measures for existing critical facilities.
3k.	Assess alternate facilities as identified in continuity of operations plans to determine if the sites are appropriately mitigated.
3l.	Advocate property acquisition or retrofitting for repetitive loss properties.
3m.	Assist and encourage new economic development and post-disaster redevelopment through the encouragement of public-private partnerships, economic diversification, and development.
GOAL 4: PROMOTE AND SUPPORT THE COMMUNITY RATING SYSTEM (CRS) FOR ALL COMMUNITIES IN POLK COUNTY.	
Objective 4.1:	Incorporate measures into the LMS to help obtain uniform credit for all CRS Communities.
Objective 4.2:	Identify and track projects in the LMS to demonstrate the role of mitigation measures in reducing flood risk.

TABLE VII-1: POLK COUNTY MITIGATION GOALS AND OBJECTIVES	
Objective 4.3:	Provide outreach and educational opportunities for the public, nonprofit, and private sector regarding flooding risks and the CRS Program.
Objective 4.4:	Advocate property acquisition or retrofitting for repetitive loss properties.
IMPLEMENTATION STRATEGIES	
4a.	Identify repetitive and severe repetitive loss areas.
4b.	Identify projects that will mitigate flood risk in repetitive loss areas.

Capacity to Implement Hazard Mitigation Activities

This section examines the capacity of Polk County municipalities to implement hazard mitigation activities. Due to differences in land area, population, and funding, municipalities have varying capability levels to implement hazard mitigation activities. The Town of Hillcrest Heights and the Village of Highland Park each have fewer than 300 people and are dependent on the County for some services.

General Hazard Mitigation Alternatives

The following local resources provide guidelines, tools, and codes as well as a designated source for funding to promote and achieve mitigation activities. These mitigation alternatives are general in nature and apply to all identified hazards.

Prevention

All municipalities in Polk County have comprehensive plans and land development codes that address land use planning. In addition, all municipalities follow the Florida Building Code. Several municipalities have dedicated stormwater management systems, with funding sources to address stormwater impacts and maintenance. The City of Lakeland, City of Lake Alfred, and Polk County (unincorporated) participate in the Community Rating System (CRS).

Natural Resource Protection

All local governments including Polk County can develop and implement natural resource protection programs to minimize the impacts of natural hazards while enhancing the local and regional environment. The Southwest Florida Water Management District has played a major role in the acquisition, preservation, and restoration of the County's natural resources.

Polk County's Environmental Lands Program acquires, preserves, protects, manages, and restores endangered and environmentally sensitive lands, water resources, and important wildlife habitats. Properties acquired by Polk County's Environmental Lands Program used for passive outdoor recreational purposes provided such uses will not disturb or degrade the environmental quality of the site.

Located in southeast Polk County and northeast Highlands County, the Avon Park Air Force Range (APAFR) plays a significant role in natural resource protection in the southeastern portion of the County. The APAFR is the largest United States Air Force training range. The APAFR consists of approximately 106,000 acres of land, of which 82,000 acres are open to the public for recreation. Public recreation activities include hunting, fishing, camping, and hiking and nature study areas. Cattle grazing leases encompass more than 96,000 acres, and timber sales take place on approximately 40,000 acres of rangeland. The Air Force engages in land management activities protecting endangered species and habitats, managing forest lands for timber production, providing cattle grazing through leases with local cattlemen, and protecting cultural resources and wetlands.

Figure VII.1: APAFR logo

The 26,000-acre Lake Wales Ridge State Forest is located east of Frostproof, consists of four separate tracts that contain outstanding examples of naturally-functioning ecosystems. The Forest provides a habitat for 24 plant species and 19 animal species with threatened or endangered Federal or State status. According to the Florida Forest Service, the scrub ecosystem thrives on the Ridge and may have the highest concentration of rare and endangered plants in the continental United States. The Florida Forest Service utilizes a multiple use management system for the Lake Wales Ridge State Forest, allowing for outdoor recreation pursuits while managing the forest resources.

The Nature Conservancy's Tiger Creek Preserve consists 4,805 acres of protected lands and is located to the north and east of Frostproof. The pristine blackwater stream that forms the spine of this sanctuary is the source of the name for Tiger Creek Preserve. The Nature Conservancy protects most of the stream and its surrounding hardwood swamps, hammocks, oak scrub, pine flatwoods, sandhill, and longleaf pine/wiregrass.

The 40-acre Barbara B. Pederson Wildlife Preserve is located on Lake Annie west of the Ridge Scenic Highway inside the southern municipal limits of Dundee. The property is -wooded urban upland with approximately 35 acres of longleaf pine in a mesic hammock. It has 1,336 feet of frontage on the Ridge Scenic Highway and 476 feet on Lake Annie. The pines are a remnant of ancient longleaf pines that grew on the uplands in Central Florida known as the "Ridge".

Emergency Services

Polk County and its jurisdictions actively participate in emergency services. Reverse 911/Alert Polk provide warning messages. The Polk County website provides hazard preparation information. Locations throughout the County provide sandbags to the public when needed. Intergovernmental coordination provides the extension of services and cooperation between jurisdictions. Polk County and its jurisdictions are members of the Local Emergency Planning Committee (LEPC) District 7, which is responsible for preparing a regional hazardous materials emergency response plan. The LEPC serves as a repository for regional hazardous materials information and performs outreach functions to increase hazardous

materials awareness. The following county-wide documents address emergency management: Comprehensive Emergency Management Plan, Polk County Post Disaster Redevelopment Plan, Polk County Community Wildfire Protection Plan, Economic Analysis and Disaster Resiliency Study, and Statewide Regional Evacuation Study for the Central Florida Region.

Figure VII.2: LEPC District 7 logo

Natural floodplains help provide storage for surface runoff, recharge our aquifers, improve water quality, support a biologically diverse population, and many other functions. Protecting these natural resources is an essential element of a successful floodplain management plan. Activities to protect natural resources include:

- Adopting and implementing floodplain management policies that reduce impact to natural systems;
- Preserving natural areas;
- Restoring natural areas;
- Protecting wetlands;
- Preventing pollution of natural systems;
- Improving water quality; and
- Preventing erosion and sedimentation in water ways.

Public Information and Awareness

Public information activities advise residents, property owners, potential property owners, and visitors about the hazards, ways to protect people and property from the hazards, and the beneficial functions of natural floodplains. The intent of these programs is to motivate people to take precautionary steps on a pre-disaster basis, and to develop awareness. Polk County and its jurisdictions implement these activities using a variety of mediums, including electronic, audio/visual, and printed media. Activities identify target audiences and deliver specific messages about the risks that affect them. These audiences include residents, as well as managers of local, state, and federal agencies. Public information activities include:

- Flyers / door hangers;
- Real estate disclosure programs;
- Map information;
- Education programs;
- Mailings;
- Social media;

- News media;
- Billboards;
- Public outreach events; and
- Technical assistance.

Comprehensive Plans

Polk County and the municipalities have adopted comprehensive plans and land development codes. The comprehensive plans address land use and public infrastructure planning over a long-range timeframe. Comprehensive plans and land development codes regulate development by dividing municipalities into zones or districts and establishing specific development criteria for each. These development criteria include provisions for the area's known hazards. Vulnerable lands are those associated with known hazards such as areas subject to flooding, dam failure, wildland fire, and land subsidence. Proper planning includes recommendations for use of these known vulnerable land areas, such as parks, greenways, wildlife refuges, and other open space uses protected from future development. Similarly, land development codes should include separate zones or districts with appropriate development criteria for known vulnerable land areas.

Land Development Codes

Polk County and the municipalities have adopted land development codes, including subdivision regulations. These regulations address how entities can subdivide land into individual lots and establish certain standards for the location and construction of buildings and associated infrastructure (i.e., roads, sidewalks, utility lines, stormwater management facilities, etc.). Land development codes include municipal-specific, hazard mitigation-related development criteria for the location and construction of buildings and other infrastructure in known hazard areas to avoid future damages and minimize existing problems. Examples of hazard mitigation-related development criteria include watershed-specific stormwater management regulations, hazard-specific building and infrastructure location limitations, and a requirement to incorporate various pre-defined, municipal-specific hazard mitigation/prevention measures into all development plans. Use of conservation subdivision design principles may be employed to mitigate potential impacts of natural hazards. Conservation subdivision design principles involve clustering homes to avoid known hazard areas (i.e., steep slopes, floodplains, etc.) and environmentally sensitive resources (i.e., wetlands, critical wildlife habitats, etc.), thereby developing the most suitable land while permanently establishing a network of protected open spaces.

Florida Building Code

The Florida Building Code regulates construction, renovation, and alteration of new and existing structures by establishing minimum building standards and providing for routine inspections by a certified building code inspector. The Florida Building Code includes standards for hazard-resistant construction including use of fire-resistant building materials, construction practices to promote wind resistance, use of waterproof or water-resistant building materials and building elevation in known flood hazard areas, and use of foundation and structure anchoring specifications in known floodwater velocity areas.

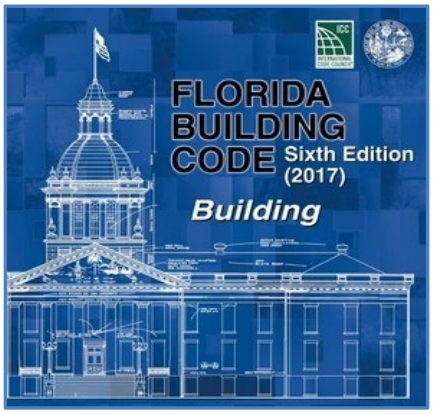


Figure VII.3: Florida Building Code

Geographic Information Systems (GIS) and Mapping

Geographic Information Systems (GIS) apply computer technology to hazard mitigation planning by linking data to maps. GIS provides a complete assessment resource for mitigation planning and other planning studies through the updating of detailed property information, socioeconomic data, critical facilities inventories, and hazard locations, among other relevant information. Not all jurisdictions in Polk County have in-house GIS capacity, but may utilize the resources of other agencies to address their mapping needs.

Flood Insurance Rate Map (FIRM) information provides flood hazard information to inquirers. Residents and business owners who are aware of potential hazards can take steps to avoid future problems and reduce their exposure to flooding. Real estate agents and potential homebuyers can determine the location of a particular property in a known flood hazard area and whether lenders may require flood insurance. The Southwest Florida Water Management District is a Cooperating Technical Partner with FEMA.

Capital Improvement Plans

Capital Improvement Plans (CIPs), housed in the Capital Improvement Elements of local government comprehensive plans, outline allocation of funds for public acquisition of open space lands, capital expenditures for emergency service facilities, improvements to retrofit or relocate vulnerable critical facilities, and other capital improvements. The CIP directs the programming of capital improvements over a 5- or 10-year period, with funding identified. Municipalities should include the capital expenditure requirements of high-priority projects within a hazard mitigation plan in the CIP.

Stormwater Management

Stormwater management involves the effective management of stormwater runoff from developed areas, which minimizes local and regional drainage problems and associated flooding hazards. Stormwater management practices that promote infiltration work toward the minimization of drought impacts by contributing to the base flow of local streams and watercourses. Land development codes of Polk County and the municipalities include stormwater management regulations, which require developers to construct on-site stormwater management facilities that collect, convey, and store surface water runoff.

Stormwater utilities exist throughout the County to remedy stormwater pollution and flooding problems. The stormwater utilities assess property owners a fee based on the amount of impervious surface in a development. All the municipalities in Polk County have stormwater utilities in place to address these problems, except the smallest municipalities of:

- Village of Highland Park, and
- Town of Hillcrest Heights.

Emergency Response Planning

Implementation of property protection measures (i.e., relocation, elevation, or floodproofing) may not be technically or fiscally feasible in certain situations. This is most often the case for larger flood-prone business and industry buildings where relocation is undesirable and retrofitting techniques may be too costly or not technically feasible. One alternative to implementing physical property protection measures is to develop an emergency response plan specific to a business or industry. An emergency response plan is a guiding document that identifies and describes emergency preparation and response procedures for pre- and post-disaster implementation to minimize hazard impacts. Emergency response planning can serve to minimize impacts to structures and their contents for a specific business or industry would constitute a property protection measure.

Education and Outreach Programs

Education and outreach programs are the first step in the process of orienting property owners to property protection measures and assisting them in designing and implementing a project. These programs encourage people to seek out more information and take steps to protect themselves and their properties. These programs are particularly suitable for those hazards that lack mitigation measures such as extreme heat, lightning, and tornadoes. Outreach projects may vary with the type of identified hazard and the targeted audience. FEMA requires Polk County, the City of Lake Alfred, and the City of Lakeland, as participants in the CRS, to provide outreach materials to Repetitive Loss Areas. This outreach identifies the various techniques for flood mitigation, as well as funding opportunities that may be of benefit to the owner.

Figure VII.4: Hurricane Expo advertising

In addition, there may be a coordinated annual outreach to the community-at-large through County or municipal Hurricane Expos. Polk County's website contains information and detailed updates during severe weather and other hazard events. Other approaches may include:

- Mass mailings or newsletters to all residents;
- Notices directed to floodplain residents;
- Displays in public buildings or shopping malls;

- Newspaper articles and special sections;
- Radio and TV news releases and interview shows;
- Presentations at meetings or relevant local organizations;
- Floodproofing open houses;
- Website notices with hyperlinks to other sources of information; and
- Hazard warning including a comprehensive disaster warning system linking a variety of systems into a network to advise the public of emergency situations. This system includes the Alert Polk System, which can use either a recorded voice or pre-recorded messages, live broadcasts from the Polk County Emergency Operations Center (EOC), and special public information messages on local television and radio stations.

The earlier and more accurate the warning, the greater the number of people who can take protective actions. Multiple or redundant systems are most effective; if people do not hear one warning, they may still receive the message from another part of the system. Depending on the circumstances, distribution of additional warning messages occurs through:

- NOAA weather radio;
- Mobile public address systems;
- Social media;
- Telephone trees;
- Internet weather-related sites;
- Municipal/County/State Internet sites;
- Door-to-door contact;
- Reverse 911/ Alert Polk; and
- Integrated Public Alert and Warning System.

Post Disaster Redevelopment Plan

Polk County's Post Disaster Redevelopment Plan identifies policies, operational strategies, and responsibilities for implementation of the plan. Elements of the plan include repair and replacement of housing, the resumption of local business, and economic redevelopment.

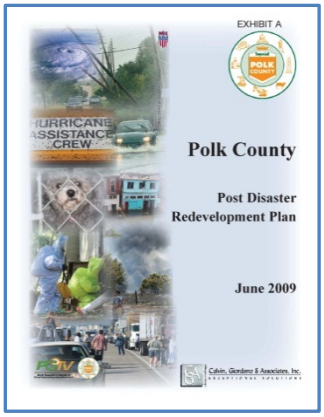


Figure VII.5: PDRP Cover

SECTION VII: MITIGATION PLAN

Identification and Analysis of Mitigation Activities and Initiatives

In formulating the LMS, the LMS Working Group considered a wide range of activities to help achieve the mitigation goals, in addition to addressing any hazard concerns. The goals and objectives identify mitigation Initiatives. The mitigation alternatives provide a link to the goals and objectives and address the risk and vulnerabilities of hazards identified by the risk assessment. These activities apply to new and existing buildings and infrastructure. Incentives for implementing hazard mitigation initiatives relate to loss reduction, public welfare, or public safety. Disincentives relate to lack of funding, staff, or resources.

Mitigation Techniques

In general, all activities considered by the LMS Working Group fall under one of the following six broad categories of mitigation techniques: prevention; property protection; natural resource protection; structural projects; emergency services; and public awareness and education. Appendix B identifies mitigation activities throughout the County.

Prevention

The goal of prevention activities is to minimize the potential development of new hazard problems and to keep existing hazard problems from becoming worse. Prevention measures include mitigation actions to alleviate those known areas of concern to ensure the issue does not continue. Prevention activities typically include government programs or regulatory actions that influence the development of land and construction of buildings. They ensure that future land development projects do not increase local and/or regional hazard risks. They are particularly effective in reducing a community's future vulnerability, especially in areas where development has not occurred, or capital improvements have not been substantial. Typically, local building, zoning, planning, and/or code enforcement officials administer prevention measures, programs, or requirements. Prevention activities include:

- Comprehensive plans;
- Land use planning/zoning efforts;
- Subdivision and land development ordinances;
- Capital Improvement Plans;
- Building codes;
- Floodplain development regulations;
- Stormwater management;
- Drainage system maintenance;
- Open space preservation;
- Operations and maintenance procedures;
- Subsurface investigation requirements;
- Detailed plans and targeted studies;
- Community Rating System programs; and
- Community Wildfire Protection Program guidance.

Figure VII.6: Drainage system maintenance

Property Protection

Property protection measures minimize an existing structure's vulnerability to a known hazard rather than mitigating or controlling the hazard itself. Property protection measures involve improvements or modifications to both public and privately-owned property to help them better withstand the impact of a hazard. Projects require the coordination (and often cost-sharing) with the respective property owners. Some measures do not affect the appearance or use of the structure, which make them appropriate for historical sites or landmarks. Frequently, implementation of a property protection measure requires acquiring a local building permit. Examples of property protection measures include:

- Acquisition;
- Relocation;
- Building elevation;
- Critical facilities protection;
- Retrofitting (e.g., wind proofing, floodproofing seismic design techniques, etc.);
- Safe rooms, shutters, shatter-resistant glass;
- Brush/scrub removal; and
- Insurance.

Figure VII.7: Building relocation; Source: The Ledger September 2014

Natural Resource Protection

Natural resource protection activities implemented as hazard mitigation measures are varied in scope, purpose, and outcome. The preservation and restoration of natural areas, environmentally-sensitive resources, or the overall quality of locally-significant features play a major role in reducing damages caused by hazard events by preserving or restoring natural areas and their protective functions. Areas include floodplains, wetlands, steep slopes, and wildland parks, recreation, or conservation agencies and organizations often implement these protective measures. Examples of natural resource protection activities include:

- Floodplain protection;
- Watershed management;
- Riparian buffers;
- Forest and vegetation management (e.g., fire-resistant landscaping, fuel breaks, etc.);
- Erosion and sediment control;
- Wetland preservation and restoration;
- Habitat preservation; and
- Slope stabilization.

Structural Projects

The intent of structural mitigation projects is to lessen the impact of a hazard by modifying the progression of the hazard event through construction. Structural projects typically involve efforts to keep floodwaters and other natural hazards from impacting specific areas or structures. The Florida Building Code requires engineers to design the projects. The responsible agency's public works staff, or property owners manage or maintain the projects. From a flood hazard mitigation perspective, these projects control flows and water surface elevations and to reduce the overall impacts of flooding. In some cases, due to cost and environmental implications, structural projects may not provide full protection to individual properties. However, the design of projects like bridges and culverts may protect people and properties. Examples of structural project activities include:

- Reservoirs;
- Dams/levees/dikes/floodwalls;
- Diversions/detention/retention;
- Channel modification;
- Storm sewers;
- Firebreaks;
- Sinkhole abatement;
- Emergency water source development; and
- Safe rooms and community shelters.

Polk County and its jurisdictions have Capital Improvement Programs that includes construction of improvements that reduce the risk of flooding or damage from flooding. The Mitigation Action Plan includes several of these projects.

Figure VII.8: Firebreak stopping fire

Emergency Services

Emergency services measures protect people during and immediately following a hazard event. The County and municipalities have Emergency Operations Plans (EOPs) formally documenting their emergency preparedness and response planning. The County EOP identifies standard operating procedures for various emergency management personnel and establishes the location and operating conditions of the EOC. Adopting and implementing the EOP is a first step in providing local emergency services measures in response to a hazard event. Implementation of emergency services measures occur at the local, County, State, and/or Federal level, depending on the severity of the hazard event. These actions occur immediately prior to, during, or in response to a hazard event. Examples of emergency service activities include:

- Activation of warning and notification systems;
- Evacuation planning and management;
- Emergency response training and exercises;
- Critical facilities protection;
- Sandbagging for flood protection;
- Installing temporary shutters for wind protection; and
- Post disaster recovery and mitigation.

Polk County Emergency Management coordinates the overall response to hazards, including major flood events that can result from hurricanes, tropical storms, and other major weather occurrences. The Polk County Emergency Operations Center coordinates warning and response activities with other municipalities within the County. Emergency Services activities conducted by Polk County include:

- Developing a flood warning system;
- Developing a flood response plan;
- Developing a monitoring system or plan for collecting data describing rainfall, stage, and discharge;
- Developing a plan for coordinating with local municipalities and agencies during emergencies;
- Updating and maintaining evacuation plans;
- Protecting critical facilities; and
- Performing routine emergency exercises.

Polk County utilizes the Alert Polk Notification System for emergency notifications. This system allows the County to send critical communications to all or targeted areas within the County in case of a situation

that requires immediate action. This system can dial the entire County within minutes. It delivers a recorded message from Polk County describing the situation and any instructions for immediate or future action.

Public Education and Awareness

Public education and awareness activities advise the community and visitors about hazards, hazardous areas, and mitigation techniques they can use to protect themselves and their property. Examples of public education and awareness measures include:

- Outreach projects;
- Speaker series/demonstration events;
- Hazard map information;
- Real estate disclosure;
- Library materials;
- Educational programs for school children; and
- Hazard expositions.

Flood Hazard Mitigation Alternatives

Floodplain development regulations establish regulatory criteria for construction and/or alteration of buildings and other development activities in the 100-year floodplain, to minimize potential flood-related damages and ensure that new development does not exacerbate local flood hazards. Polk County and all the municipalities, except the Village of Highland Park and the Town of Hillcrest Heights, participate in the National Flood Insurance Program (NFIP) and must adopt and enforce local floodplain development regulations that meet or exceed minimum NFIP standards and requirements. Floodplain construction standards are also part of the Florida Building Code. NFIP floodplain development regulations prohibit obstruction of the regulatory floodway and require builders of new buildings in the 100-year floodplain to protect buildings from damage from the base flood (i.e., 100-year or 1 percent annual chance flood). These regulations prevent loss of life and property as well as economic and social hardships that result from flooding.

Relocation or Moving of Structures

Relocation, or moving a building to higher ground, is a way to minimize potential flooding impacts. Removing buildings from the floodplain is not only the most effective flood protection measure available, but it also converts a problem area into a community asset with environmental benefits. Relocation is an alternative for large lots that include buildable areas outside the floodplain or where the owner has a flood-free lot available. Relocation may be expensive. While people can move almost any building, the cost increases for heavier structures such as those with exterior brick and stone walls, and for large or irregular-shaped buildings. There are factors that affect the feasibility of relocation, such as road width and grade, density of overhead utilities, and other related factors.

Acquisition of Buildings

Acquisition of buildings in a flood-prone area ensures the buildings will no longer be subject to flood damage. Government agencies may undertake acquisition, so the property owner does not bear the cost and the government agency may convert the use of the land to a public use, such as a park. Acquisition followed by demolition is most appropriate for buildings that are difficult to move, such as larger, slab-on-grade foundation or masonry structures, and dilapidated structures that are not feasible to protect. Responsible agencies must complete a cost-benefit analysis and investigate other less costly alternatives.

Elevation of Buildings

Elevation of a flood-prone building above the base flood elevation is often the best on-site protection strategy. In Flood Zone 'A', the property owner can raise the building to allow water to run underneath it. Alternatively, it may be possible to use fill to elevate the site on which the building sits. This approach is less expensive than relocation or acquisition and tends to be less disruptive to a neighborhood. Local floodplain regulations and the Florida Building Code require elevations for new and substantially-improved buildings in a floodplain.

Dam, Levee, and Floodwall Installation

Dams, levees, and floodwalls are similar in that they control flooding by restricting floodwaters from reaching/inundating protected areas. These are probably the best-known forms of structural flood control projects implemented in the United States. Just like any other engineering feature, exceeding the design capacity of a dam, levee, and/or floodwall may compromise its functional utility. Dams, levees, and floodwalls can give a false sense of security to the property owners they protect.

Bridge/Culvert Modifications

If undersized, bridge/culvert modifications at local stream and watercourse crossings can result in floodwater backing up upstream of the structure, causing significant flooding problems. From a flood hazard mitigation perspective, bridge/culvert modifications typically involve the replacement, enlargement, and/or removal of existing roadway bridges and culverts known to cause flooding problems. Replacing, enlarging, or removing these known problematic structures is an effective approach to mitigating flooding problems.

Figure VII.9: Culvert modifications

Open Space Preservation

Open space preservation is keeping known hazard areas free of development and in a natural condition and is the best approach to minimizing or preventing potential flood damages. Preserving open space in an undeveloped floodplain not only prevents potential flood damage, but also allows for the full realization of the floodplain's natural and beneficial functions. These functions include floodwater storage/flood flow attenuation, surface water infiltration/groundwater recharge, removal/ filtering of pollutants and sediments from floodwater, habitat for flora and fauna, and recreational opportunities. Comprehensive plans and land development codes regulate open space preservation.

Wetland Protection

Floodplains and low-lying areas of a watershed require wetland protection. Many wetlands receive and store floodwaters, thus slowing and reducing stream flows. Wetlands serve as natural filters that help to improve water quality and provides habitat for many species of fish, wildlife, and plants. Local wetland protection codes and programs address gaps in Federal and State regulations.

River and Stream Corridor and Lake Restoration and Protection

River and stream corridor restoration and protection measures help restore the natural and beneficial functions of riparian zones to manage floods and filter runoff. Lakeshore protection measures are in place in many incorporated areas.

Best Management Practices

Best Management Practices (BMPs) are measures that reduce the volume of surface water runoff and associated nonpoint source pollutants from entering waterways. Surface water runoff transports nonpoint source pollutants, which include lawn fertilizers, pesticides, farm chemicals, sediments, and oils from both pervious and impervious urban and rural areas. Nonpoint source pollutants not only affect the quality of local water resources, but also their ability to carry and store floodwaters. Eroded soil from farmlands and construction sites deposit at locations where streams and rivers slow down and lose energy, such as when they enter a lake or confluence with another stream.

Uncontrolled surface water runoff contributes to local and regional flooding problems. From a hazard mitigation perspective, the identification and implementation of BMPs focuses on structural and non-structural erosion and sedimentation control and stormwater management facilities. Implementation of many BMP measures (structural and/or nonstructural) can address site-specific needs. New development can incorporate erosion and sedimentation control and stormwater management BMPs into retention and detention basins, drainageways, and other parts of new development.

Several local ordinances require specific BMPs and structural measures for industrial sites, mined lands, construction sites, farms, forested areas, and high-use public lands. Other engineering and construction standards include BMP guidelines to ensure that structures withstand various hazards.

Wind Mitigation Alternatives

Proper engineering and design of a structure increases its ability to withstand the lateral and uplift forces of wind. Recommended building techniques provide a continuous load path from the roof of the structure to the foundation. The LMS Working Group reviewed the following wind mitigation alternatives:

- Windproofing is the modification of the design and construction of a building to resist damage from wind events, and can help to protect the building's occupants from broken glass and debris. Windproofing involves consideration of aerodynamics, materials, and the use of external features such as storm shutters. The Florida Building Code requires windproofing in the design and construction of new structures, and recommends reinforcing existing structures. Improved methods for anchoring structures to foundations better protects mobile homes, which tend to be vulnerable to the effects of extreme wind events. The Florida Building Code requires installers of mobile homes to tie the homes down to their pads. The Florida Building Code requires public facilities, critical infrastructure, and public infrastructure (such as signage and traffic signals) to be windproofed in vulnerable areas. However, windproofing is not a viable mitigation technique to protect against tornadoes or extreme hurricanes.

Figure VII.10: Tie-downs for windproofing

- Safe room and community shelter requirements for new housing construction and existing mobile home parks, apartment complexes, and other planned residential communities can offer protection and reduce the risk to life. ARC 4496 and FEMA 320 Taking Shelter from the Storm include minimum design criteria for the construction of these elements.

- Underground power lines can offer uninterrupted power during and after severe wind events and storms. Burying power lines can significantly enhance a community's ability to recover in the aftermath of a disaster; however, power lines are more expensive to install and repair if there were a problem and may be more vulnerable to flooding in some locations.

Figure VII.11: Underground utilities

- Encouraging back-up power sources in areas where power line burial is not feasible may enable continuity of basic operations for businesses and facilities when there is a loss of power.

Fire Mitigation Alternatives

The following are mitigation alternatives to reduce vulnerability from wildfires reviewed by the LMS Working Group.

- An urban forestry program, where several cities nationwide have participated in formal programs to protect and maintain urban forests, is helpful for the mitigation of wildfires.

- The State uses firebreaks to limit the mobility of potential wildfires. Construction of a firebreak involves removing vegetation in a linear strip to significantly diminish the available fuel load. There may be locations in the County where construction of a firebreak may prove to be a feasible and prudent wildfire hazard mitigation measure, particularly in areas where there is rural development adjacent to forested areas or limited access. This type of development scenario is particularly susceptible to wildfire hazards.

- Emergency water source development increases public water supply systems and the associated curbside hydrants for local firefighting needs. A solution for access to reliable water sources and the ability to efficiently pump water from those sources is the installation of dry hydrants at bridge and culvert crossings of local streams and watercourses.

Figure VII.12: Prescribed burning

- State and Federal land management agencies' use of planned wildland fuels burning programs (prescription burning) is the best proven method to reduce hazardous wildland fuel accumulations. This process is routinely accomplished with the establishment of firebreaks and is conducted on State, Federal, and private lands where the accumulation of wildland fuels can pose a threat to neighboring communities. These carefully planned operations must meet specific weather conditions.

- Vegetation reduction is an efficient action to reduce the risk of wildfires. Vegetation-fuel management through tree and vegetation thinning or reducing the amount of herbaceous vegetation by chopping or mowing decreases the chances of fire propagation across the landscape by breaking up the horizontal and vertical continuity of fuel. This reduces fireline intensity, significantly lowers the risk of structure loss, and creates a safer situation in which to deploy suppression resources.

Sinkhole Mitigation Alternatives

Sinkhole abatement is the treatment of new and existing sinkholes to minimize potential damage to buildings, infrastructure, and other surface features. Sinkhole treatment is usually abatement after the sinkhole forms rather than prior mitigation. Abatement involves filling the surface feature with a mixture of materials including concrete, soil, grout, synthetic filter fabrics, and various sizes of crushed stone. Since no two sinkholes are alike, abatement can vary in the type and volume of materials utilized. Precautions,

which are designed to reduce safety concerns and mitigate potential environmental impacts, include barricading the site to prevent personal injury, excavating the overlying soil to determine the appropriate abatement method and to expose a competent limestone ledge, and directing surface drainage away from the site to prevent reoccurrence.

The Favorability of Florida's Geology to Sinkhole Formation report from June 2017 outlined proposed mitigation measures within sinkhole-prone areas through proper planning, geotechnical site investigation, appropriate design, and proper maintenance of infrastructure. These include recommending building code changes to address the following sources of focused recharge (*Veni et al (2015)):*

- Roof runoff;
- Street drainage;
- Lawn irrigation systems;
- Effluent from septic tanks;
- Leaking plumbing below or beside buildings;
- Obsolete or unrepaired shallow irrigation wells;
- Unlined stormwater ponds;
- Leaking swimming pools; and
- Wastewater spray fields.

The following methods can mitigate karst activity in sensitive areas (*Gutierrez et al (2008))*

- Utilize geomembranes and geotextiles;
- Create efficient drainage systems and divert surface runoff;
- Remediate existing sinkholes;
- Grout cavities;
- Improve ground compaction by injection grouting to increase strength and weight bearing capacity of soils;
- Construct cutoff screens and grout curtains to arrest groundwater circulation;
- Construct engineered slabs;
- Reinforce foundations using beams;
- Incorporate tensile geogrids in subbase and embankments of roads and railways;
- Utilize oversized piers and pads and sacrificial piers for bridges;
- Instrument critical infrastructure with monitoring devices;
- Implement educational programs for policy and decision makers; and
- Install signage in existing hazard areas.

Mitigation is common practice for critical infrastructure such as power plants, landfills, water treatment facilities, highways, bridges, large reservoirs, pipelines, and transmission lines. A pre-construction geologic or geotechnical site investigation can be an effective mitigation tool to identify potential karst hazards. In addition to mitigation measures listed above, those tools include:

- Visual site inspection by a licensed professional geologist (to identify potential surface anomalies);
- Geophysical surveys (to investigate for anomalous zones below ground and test surface anomalies);
- Exploratory boreholes (to test geologic strength or investigate anomalies identified by geophysics); and
- Dynamic ground improvement (to compact and strengthen subsurface geology and to collapse unforeseen cavities), including:

- Rolling surcharge;
- Dynamic compaction; and
- Vibratory compaction.

Selection of Mitigation Activities and Initiatives for Polk County

Mitigation Activities – One-Time Projects and Ongoing Projects

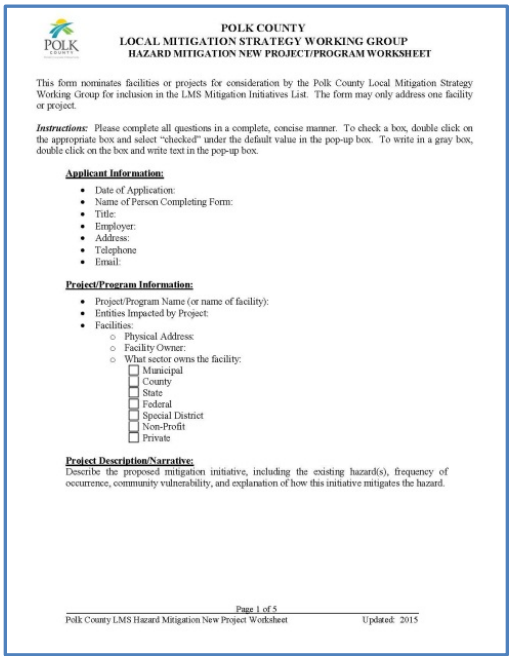
Mitigation activities include one-time projects and ongoing projects. One-time projects have a start and end date for completion. Ongoing projects repeat on a regular basis (daily, weekly, etc.). The selection of mitigation activities and initiatives described below relates to one-time projects. The *Mitigation Plan – Ongoing Projects* table identifies the ongoing mitigation activities of the LMS partners.

Project Status Verification

In keeping with FEMA requirements for MAP updates, the LMS Working Group evaluated the mitigation actions identified in the LMS to determine their 2020 implementation status. Each agency responsible for implementation of a mitigation action provided an update on implementation status (completed, deleted, or deferred), and milestones achieved or impediments to implementation of the actions. Appendix C includes the project status verification.

Mitigation Activity Project Submittal

As part of the 2020 LMS update, all jurisdictions and partners submitted project applications for new one-time projects listed in the MAP. Appendix C includes the project submittal form.



POLK COUNTY
LOCAL MITIGATION STRATEGY WORKING GROUP
HAZARD MITIGATION NEW PROJECT/PROGRAM WORKSHEET

This form nominates facilities or projects for consideration by the Polk County Local Mitigation Strategy Working Group for inclusion in the LMS Mitigation Initiatives List. The form may only address one facility or project.

Instructions: Please complete all questions in a complete, concise manner. To check a box, double click on the appropriate box and select "checked" under the default value in the pop-up box. To write in a gray box, double click on the box and write text in the pop-up box.

Applicant Information:

- Date of Application:
- Name of Person Completing Form:
- Title:
- Employer:
- Address:
- Telephone
- Email:

Project/Program Information:

- Project/Program Name (or name of facility):
- Entities Impacted by Project:
- Facilities:
  - Physical Address:
  - Facility Owner:
  - What sector owns the facility:
    - ☐ Municipal
    - ☐ County
    - ☐ State
    - ☐ Federal
    - ☐ Special District
    - ☐ Non-Profit
    - ☐ Private

Project Description/Narrative:
Describe the proposed mitigation initiative, including the existing hazard(s), frequency of occurrence, community vulnerability, and explanation of how this initiative mitigates the hazard.

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Polk County LMS Hazard Mitigation New Project Worksheet Updated: 2015

Figure VII.13: Project submittal form

The following mitigation initiative types serve as the basis for proposed projects:

- *Floodproofing*: Any combination of structural and non-structural additions, changes, or adjustments to structures that reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures, and their contents.

- *Wind retrofitting*: Structural modifications intended to reduce the vulnerability of and damage to buildings caused by wind and wind-driven rain intrusion before, during, or after a high wind event. Areas of vulnerability include roof and wall coverings, openings (windows and doors), and load path connections.

- *Stormwater management:* Program for controlling and directing storm water runoff so it does not overwhelm or negatively impact drainage and infrastructure control systems.

- *Floodplain management*: 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.

- *Infrastructure hardening*: Strengthening and/or retrofitting critical structures, such as roads, bridges, drainage conveyances, etc., to reduce vulnerability to wind, rain, and flooding events.

- *Acquisition and demolition:* Purchase and/or destruction of damaged property that is not feasible to rebuild or retrofit to prevent similar damages to future structures built in the same location.

Mitigation Initiatives

The comprehensive "Polk County Multi-Jurisdictional LMS Mitigation Initiatives" is based on ideas from the LMS Working Group and from the vulnerability analysis completed for structures within Polk County (Risk Analysis Section). The list incorporates initiatives of the County, municipalities, and Polk County Public Schools. The sponsor column identifies the sponsor of each initiative.

The entity ultimately responsible for the implementation and/or management of each initiative has sponsored the initiative through the completion and submission of a Hazard Mitigation New Project/Program Worksheet to assist with efficiency and precision of the ranking process. Appendix C includes a copy of the Hazard Mitigation New Project/Program Worksheet. The project sponsor completed the cost estimates. A detailed explanation of the process used to determine the initiatives is in the Mitigation Cost-Benefit Review and Prioritization of the LMS.

The LMS Working Group did not rank projects from the 2019 project list that were either completed or not carried forward through the submittal of a Hazard Mitigation New Project/Program Worksheet. The Deferred, Completed, or Deleted Projects Table in Appendix B includes a list of these projects to illustrate the changes from the last project list update. Some project sponsors deleted projects because the project became unnecessary, a private party assumed responsibility, or the project was not cost-feasible.

SECTION VII: MITIGATION PLAN

Evaluation and Prioritization of Mitigation Initiatives

To determine the most appropriate mitigation techniques for the communities in Polk County, the LMS Working Group thoroughly reviewed and considered the findings of the *Hazard Analysis and Risk Assessment*. Other considerations included the effect of each mitigation action on overall risk to life and property, ease of implementation, degree of political and community support, general cost-effectiveness, and funding availability.

In evaluating proposed mitigation alternatives, the LMS Working Group considered the importance of the identified goals and objectives. Cost estimates are based on best available data, including similar projects completed in other communities, professional judgments using costing tools such as Means Residential Cost Data and Repair and Remodeling Cost Data, or by determining fair market values for goods or services. The cost estimates are a rough determination of the cost effectiveness of the mitigation projects and are not the basis to obtain services or grant funding. The LMS Working Group also considers the benefits of each project. Benefits included the number of people positively impacted including the benefit to special needs populations, savings in structural or operating costs, benefits to the environment, and benefits to the long-term effectiveness of the project. To assess the importance of each project, the LMS Working Group considered several factors including:

- Importance for community safety;
- Whether the project addressed critical facilities vulnerability;
- Number of buildings the project would help to protect;
- Amount of damages the project would help to prevent; and
- Cost effectiveness.

The LMS Working Group evaluates each proposed mitigation action to assess level of impact using the Social, Technical, Administrative, Political, Legal, Economic, and Environmental (STAPLEE) cost-benefit review format. The STAPLEE format enables the LMS Working Group to review each project against the criteria for ranking (see below). The LMS Working Group ranks the measure receiving the highest score as a high priority. In the event of ties, the LMS Working Group may list mitigation measures higher if the LMS Working Group perceives them to have the greatest benefit/cost or impact the greatest number of people. The LMS Working Group reviews the mitigation initiatives and prioritization score draft results during regular meetings. The score may change as priorities in Polk County change and with the addition of new mitigation actions. Change is normal and healthy in the hazard mitigation process.

Mitigation actions include those that are general in nature and those specific to high-vulnerability hazards. Depending on the availability of funding for various types of projects, the LMS Working Group may consider applications for a project with a lower score. All projects submitted for funding will have an analysis completed that shows each project to be cost beneficial.

Cost-Benefit Review – STAPLEE

Since it is often impossible for entities to implement all mitigation actions identified in the LMS due to monetary and other limitations, the LMS Working Group is responsible for prioritizing proposed mitigation actions. Mitigation plans must prioritize projects with emphasis on maximization of benefits over costs. A cost-benefit review considers the benefits that would result from a mitigation action versus the cost.

The LMS uses the STAPLEE cost-benefit method to review and prioritize mitigation projects. This method uses a point system to determine a priority ranking for each mitigation action, which allows the LMS

Working Group to evaluate proposed actions quickly and in a systematic fashion. The LMS Working Group amended the STAPLEE criteria and weighting to address issues specific to the County. These amended criteria require the LMS Working Group to assess each mitigation activity based on the STAPLEE constraints and opportunities for implementing the mitigation action in the community. Figure VII.14 provides an illustration of the STAPLEE Action Evaluation table, and Table VI-2 includes the criteria assessed with STAPLEE.

STAPLEE ACTION EVALUATION TABLE

STAPLEE Criteria Considerations																															
1=Favorable 0=Neutral -1=Less Favorable Multiply by number in parenthesis																															
			S (Social)			T (Technical)					A (Administrative)			P (Political)			L (Legal)					E (Economic)				E (Environmental)				
Category	Entity	Project Description	Community Acceptance	Effect of Segment of Population	Effect of Community (2)	Technically Feasible (3)	Long-term Solution	Expertise Required & Available (2)	Reasonable Timeframe	Secondary Impacts	Capability to Implement	Funding Allocated	Community Provide Maintenance (3)	Politically Acceptable	Local Champion	Public Support	Authority to Implement (2)	Comply with Environmental Regulations (3)	Legal Side Effects/Taking	HOA Bylaw/Deed Restrictions	Potential Legal Challenge	Reasonable Cost (2)	Burden on Economy	Contributes to Economic Goals (2)	Additional Jobs (2)	Impact Floodplain/Wetland (3)	Natural Environment	Environmental Regulatory Approvals (2)	Utility and Transportation Systems			

Figure VII.14: STAPLEE action evaluation table

TABLE VII-2:
CRITERIA FOR STAPLEE ACTION EVALUATION TABLE

Category	Criteria*	Description
Social	Community Acceptance:	*Is the proposed action socially acceptable to the community?*
	Effect on Segment of Population:	*Are there equity issues involved that would mean that the project treats one segment of the community unfairly?*
	Effect on Community (2):	*Will the action cause social disruption?*
Technical	Technically Feasible (3)	*Will the proposed action work?*
	Long-term Solution:	*Does it solve a problem or only a symptom?*
	Create more Problems:	*Will it create more problems than it solves?*
	Reasonable Timeframe:	*Can the responsible agency complete the project in a timely fashion?*
Administrative	Capability to Implement:	*Does the responsible agency have enough funding, staff, and technical support available to implement the action?*
	Funding secured and allocated:	*Does the responsible agency have funding secured and allocated for the project?*
	Community Provide Maintenance (3):	*Will the responsible agency be able to provide long-term maintenance for the project?*

TABLE VII-2:
CRITERIA FOR STAPLEE ACTION EVALUATION TABLE

Category	Criteria*	Description
Political	Politically Acceptable:	*Is the action politically acceptable?*
	Local Champion:	*Is there a local champion for the project to lead the effort?*
	Public Support:	*Is there public support both to implement and to maintain the project?*
Legal	Authority to Implement (2):	*Is the responsible agency authorized to implement the proposed action?*
	Side Effects/Taking: Are there legal side effects?	*Could somebody construe the activity be as a taking?*
	Comply with Environmental Regulations (3):	*Does the activity comply with environmental regulations? Will the activity require environmental permits?*
	HOA Bylaws/Deed Restrictions:	*Does the project meet HOA Bylaws/Deed Restrictions?*
	Potential Legal Challenge:	*Will someone challenge the activity?*
Economic	Reasonable Cost (2):	*Do the benefits exceed the costs?*
	Burden Economy:	*What burden will this action place on the tax base or local economy?*
	Contributes to Economic Goals (2):	*Does the action contribute to other community goals, such as capital improvements or economic development?*
	Additional Jobs (2):	*Does the action promote the addition of jobs in the Community or the County?*
Environmental	Impact Floodplain/Wetland (3):	*Will the action influence floodplains or wetlands?*
	Natural Environment:	*Will the action influence the natural environment?*
	Environmental Regulatory Approvals (2):	*Will the action need environmental regulatory approvals?*
	Utility and Transportation Systems:	*Will the action influence utility and transportation systems?*

* Numbers in parenthesis represent the weighted points.

The LMS Working Group scores every subcategory with a favorable (1), neutral (0), or less favorable (-1) ranking. Subcategories with numbers next to them indicate a weighted category, so the LMS Working Group multiplies its ranking by the number in parentheses. For example, a favorable (1) ranking for "Technically Feasible" would result in a score of 3, while an unfavorable (-1) ranking for "Authority to Implement" would result in a score of (-2). The sum of all the subcategories provided the priority ranking for that project, with higher rankings receiving higher priority. Appendix B includes the STAPLEE Action Evaluation Table.

SECTION VII: MITIGATION PLAN

Polk County Multi-Jurisdictional Mitigation Action Plan

The Multi-Jurisdictional Mitigation Action Plan is a listing of the mitigation actions proposed by Polk County and its jurisdictions and partners. It does not serve as a "grant wish list". As described above, it includes ongoing and one-time projects. The LMS Working Group designed The Multi-Jurisdictional Mitigation Action Plan to address the hazards impacting the County with consideration for the adopted mitigation goals and objectives. The LMS Working Group will maintain it on a regular basis according to the LMS maintenance procedures established in Section III: Planning Process, Evaluation, and Maintenance. The Multi-Jurisdictional Mitigation Action Plan represents an unambiguous and functional plan for action. The LMS Working Group has identified each proposed mitigation action as an effective measure (policy or project) to reduce hazard vulnerability.

The Multi-Jurisdictional Mitigation Action Plan includes two components that work together to outline the plan for mitigating the identified hazards, vulnerabilities, and risks. The two components include:

- Current Activities (Ongoing Projects): The ongoing (routine) projects and initiatives to mitigate potential hazards. These activities range from enforcing adopted Code requirements to street sweeping to keep stormwater systems free of garbage and debris.
- Future Initiatives (One-time Projects): An activity that involves the creation of a unique product or service that mitigates potential hazards.

Mitigation Action Plan Tables

The Polk County Multi-jurisdictional Mitigation Action Plan includes the *Deferred, Completed, or Deleted Mitigation Action Plan* table, the *Ongoing Projects* table, and the *Mitigation Initiatives* Table as described below.

- The *Mitigation Action Plan – List of Deferred, Completed, or Deleted Mitigation Projects* (Appendix B) table identifies the status of each project from the last adopted Mitigation Action Plan. The current Mitigation Action Plan Table includes all projects identified as "deferred" and "new".
- The *Mitigation Action Plan – Ongoing Projects* (Appendix B) table identifies initiatives each jurisdiction undertakes on an ongoing basis to mitigate against the identified hazards.
- The *Mitigation Action Plan – Mitigation Initiatives* (Appendix B) table is a listing of all ranked mitigation action items. The Mitigation Initiatives table includes documentation of the implementation of each mitigation measure, including the following information for each action item:
  - Funding sources;
  - Timeframe; and
  - Responsible agencies.

Funding Sources

The MAP – Mitigation Initiatives table identifies potential funding sources for the mitigation actions. Many of the mitigation actions are eligible for funding from more than one source. In these cases, the matrix includes a list of potential funding sources. Most Federal funding sources, such as FEMA, will require a percentage (usually 25 percent of the total project costs) from a local source. Appendix F includes more detailed information about potential funding sources.

Time Frame

One-time action items include short-term and long-term activities. Each action item includes an estimate of the timeline for implementation. Short-term action items are activities that agencies can implement with existing resources and authorities within one to two years. Long-term action items may require new or additional resources or authorities and may take between one and five years to implement. The MAP – Mitigation Initiatives includes the approximate timeframes for project implementation.

Responsible Agency

The responsible or lead agency is the agency with regulatory responsibility to address natural hazards, or that is willing and able to organize resources, find appropriate funding, or oversee activity implementation, monitoring, and evaluation. Responsible agencies may include local, County, or regional agencies, or partners are capable of or responsible for implementing activities and programs.

SECTION VIII – LMS ADOPTION

44 Code of Federal Regulations	
44 CFR §201.6(c)(5):	Documentation that the LMS has been formally adopted by the governing body of the jurisdiction requesting approval of the LMS (e.g., City Council, County Commissioner, Tribal Council). For Multi-Jurisdictional plans, each jurisdiction requesting approval of the LMS must document that it has been formally adopted.

The Polk County Clerk of the Circuit Court and each jurisdiction's or partner's Clerk (or other official keeper of records) shall maintain original signed copies of resolutions adopting the Polk County 2020 Multi-Jurisdictional Local Mitigation Strategy (LMS). All jurisdictions must follow the participation requirements described in Section III to remain in good standing with the Polk County 2020 Multi-Jurisdictional LMS. An executed adoption resolution along with compliance with LMS participation rules qualifies partners to submit qualified mitigation projects for Federal funding consideration.

Benefits of Adoption

The LMS assesses the vulnerability of the County and its jurisdictions to hazards, and elaborates on risk associated with each hazard assessed. It identifies and evaluates local mitigation efforts and their usefulness, as well as provides guidance for implementation at the jurisdictional level. Through adoption of this LMS the County, its jurisdictions, and the Polk County School Board may be eligible for funding to implement mitigation actions. Adoption of this LMS will assist the County and other jurisdictions to:

- Comply with Administrative Rules 27P-6, Florida Administrative Code (F.A.C.), requirements for local Comprehensive Emergency Management Plans to identify and describe hazard mitigation;
- Obtain universal points from the National Flood Insurance Program (NFIP) Community Rating System (CRS) for developing a Floodplain Management Program, which may help further reduce flood insurance premium rates for property owners;
- Access Federal Mitigation Assistance grant programs;
- Comply with the Disaster Mitigation Act of 2000;
- Set forth the guiding principles with which the County and jurisdictions will address the issue of all hazard mitigation;
- Identify hazards to which the County is vulnerable, identify the range of hazard impacts, and delineate individual vulnerabilities of various jurisdictions and population centers within the County;
- Develop a detailed method by which Polk County (jurisdictions, County government, and partners) can evaluate and prioritize proposed mitigation projects in accordance with Federal requirements;
- Ensure jurisdictional plans are consistent and supportive;
- Save lives and property;
- Save money;
- Speed recovery following disasters;
- Reduce future vulnerability through development and post-disaster recovery and reconstruction;
- Expedite receipt of pre-disaster and post-disaster grant funding; and
- Demonstrate a firm commitment to improving community health and safety.

SECTION VIII: LMS ADOPTION

Formal Adoption of LMS: Resolutions of Jurisdictions

The LMS Working Group submitted the Polk County 2020 Multi-Jurisdictional LMS to the Florida Division of Emergency Management (FDEM) for review and approval. FDEM has the authority to review the LMS on behalf of the Federal Emergency Management Agency (FEMA). FDEM utilizes the Local Hazard Mitigation LMS Review Tool, which includes the 2018 Florida Local Mitigation Strategy Crosswalk, to review the LMS. Appendix D includes Polk County's 2020 LMS Crosswalk. Following notification of "Approval Pending Adoption" of the 2020 Update by FDEM and FEMA, Polk County, its jurisdictions, and the Polk County School Board may formally adopt the 2020 Polk County Multi-Jurisdictional Local Mitigation Strategy at advertised public meetings. The LMS Working Group anticipates adoption by the following jurisdictions:

- Polk County
- City of Auburndale
- City of Bartow
- City of Davenport
- Town of Dundee
- City of Eagle Lake
- City of Fort Meade
- City of Frostproof
- City of Haines City
- Town of Hillcrest Heights
- Village of Highland Park
- City of Lake Alfred
- Town of Lake Hamilton
- City of Lake Wales
- City of Lakeland
- City of Mulberry
- City of Polk City
- City of Winter Haven
- Polk County Public Schools

SECTION VIII: LMS ADOPTION

The following is a sample LMS adoption resolution. Appendix H includes copies of adoption resolutions for each jurisdiction.

SAMPLE RESOLUTION _____

A RESOLUTION OF THE TOWN COMMISSION OF THE TOWN OF DUNDEE, FLORIDA ADOPTING THE 2020 POLK COUNTY MULTI-JURISDICTIONAL LOCAL MITIGATION STRATEGY UPDATE.

WHEREAS, areas of Polk County, including the Town of Dundee, are vulnerable to the human and economic costs of natural, technological, and societal disasters; and

WHEREAS, the Town Commission of the Town of Dundee realizes the importance of reducing or eliminating those vulnerabilities for the overall public health, safety, and welfare of the community; and

WHEREAS, a Local Mitigation Strategy is a LMS which presents a unified strategy to building a disaster-resilient community; and

WHEREAS, the Disaster Mitigation Act of 2000 requires each local jurisdiction to have either its own local mitigation strategy or to actively participate in the development and maintenance of multi-jurisdictional mitigation strategy; and

WHEREAS, the Town of Dundee actively participated in the development and maintenance of the Polk County Local Mitigation Strategy as adopted in 2002, 2005, 2010, and 2015; and

WHEREAS, the Town of Dundee has actively participated in the 2020 update to the Local Mitigation Strategy through the Polk County Local Mitigation Strategy Working Group, which has established a comprehensive, coordinated planning process to eliminate or decrease these vulnerabilities; and

WHEREAS, Town of Dundee representatives and staff have identified, justified, and prioritized proposed projects and programs needed to mitigate the vulnerabilities of the Town of Dundee to the impacts of future disasters; and

WHEREAS, the Polk County 2020 Multi-Jurisdictional LMS incorporated these proposed projects and programs into the update that has been prepared and issued for consideration and adoption by the jurisdictions of Polk County; and

WHEREAS, the State of Florida Division of Emergency Management has issued an "Approval Pending Adoption" of the Polk County 2020 Multi-Jurisdictional Local Mitigation Strategy.

SECTION VIII: LMS ADOPTION

NOW, THEREFORE, BE IT RESOLVED, by the Town Commission of the Town of Dundee:

1. The Town Commission of the Town of Dundee hereby accepts and adopts its designated portion of the "Polk County 2020 Multi-Jurisdictional LMS".

2. Agency personnel of the Town of Dundee shall pursue available funding opportunities for implementation of the proposals and projects designated therein.

3. Agencies and organizations within the Town of Dundee will, upon receipt of such funding or other necessary resources, seek to implement proposals contained in the LMS.

4. The Town of Dundee will continue to participate in the updating and expanding of the LMS in future years.

5. The Town of Dundee will encourage businesses, industries, and community groups operating within Polk County to also participate in updating and expansion of the LMS in the years ahead.

6. The Town of Dundee will continue to participate in the furtherance of public involvement opportunities.

INTRODUCED AND PASSED by the Town Commission of the Town of Dundee, Florida, in regular session, this _____ day of _____, 2020.

(Signatures as appropriate for the jurisdiction)

SECTION IX – RESOURCES

Staff and the LMS Working Group relied on a variety of resources to obtain information and guidance in completing the update of the Polk County 2020 Multi-jurisdictional LMS Plan. The following list represents sources of information consulted.

Existing Plans, Documents, and Reports

- Polk County Comprehensive Plan
- Polk County Unified Land Development Code
- City of Auburndale Comprehensive Plan
- City of Auburndale Land Development Regulations
- City of Bartow Comprehensive Plan
- City of Bartow Land Development Regulations
- City of Davenport Comprehensive Plan
- City of Davenport Land Development Regulations
- City of Eagle Lake Comprehensive Plan
- City of Eagle Lake Land Development Regulations
- City of Fort Meade Comprehensive Plan
- City of Fort Meade Land Development Regulations
- City of Frostproof Comprehensive Plan
- City of Frostproof Land Development Regulations
- City of Haines City Comprehensive Plan
- City of Haines City Land Development Regulations
- City of Lake Alfred Comprehensive Plan
- City of Lake Alfred Land Development Regulations
- City of Lake Wales Comprehensive Plan

- City of Lake Wales Land Development Regulations
- City of Lakeland Comprehensive Plan
- City of Lakeland Land Development Regulations
- City of Mulberry Comprehensive Plan
- City of Mulberry Land Development Regulations
- Polk City Comprehensive Plan
- Polk City Land Development Regulations
- City of Winter Haven Comprehensive Plan
- City of Winter Haven Land Development Regulations
- Town of Dundee Comprehensive Plan
- Town of Dundee Land Development Regulations
- Town of Lake Hamilton Comprehensive Plan
- Town of Lake Hamilton Land Development Regulations
- Town of Hillcrest Heights Comprehensive Plan
- Town of Hillcrest Heights Land Development Regulations
- Village of Highland Park Comprehensive Plan
- Village of Highland Park Land Development Regulations
- Polk County Bone Valley Selected Area Study Existing Conditions Analysis, May 2012
- Polk County Communitywide Wildfire Protection Plan (CWPP)
- Polk County Comprehensive Emergency Management Plan (CEMP)
- Polk County Disaster Debris Management Plan (DDMP)
- Polk County Momentum 2040 Plan
- Polk County Post Disaster Redevelopment Plan (PDRP)

- Central Florida Regional Planning Council Strategic Regional Policy Plan
- Central Florida Region Economic Analysis and Disaster Resiliency Study
- Council on Homelessness Report by the Department of Children and Families, Council on Homelessness
- Division of Emergency Management 2018 Statewide Emergency Shelter Plan
- Division of Emergency Management 2018 Florida Enhanced State Hazard Mitigation Plan
- Federal Emergency Management Agency Natural Hazards Report
- Federal Emergency Management Agency Local Mitigation Handbook (2019)
- Federal Emergency Management Agency State of Florida Wildfire Hazard Mitigation Plan
- National Flood Insurance Program Community Rating System Coordinator's Manual
- National Flood Insurance Program Community Status Book
- National Flood Insurance Program Flood Insurance Manual

Agencies and Websites

- AP News
- Arizona State University Spatial Hazard Events and Losses Database for the United States, Version 18.0. https://cemhs.asu.edu/sheldus
- Bay News 9
- Center for Disease Control and Prevention
- Center for Emergency Management and Homeland Security, Arizona State University.
- Central Florida Development Council
- Central Florida Regional Planning Council (CFRPC)
- Citrus Canker and Citrus Greening in Florida Map
- Citrus Health Response Program (CHRP)

- City Lab: www.citylab.com/weather
- EquiManagement
- Federal Emergency Management Agency
- Federal Rail Administration
- FEMA Flood Policy Statistics as of September 30, 2018
- FL Dept of Ag and Consumer Services (DOACS) www.Freshfromflorida.com
- Florida Charts – epidemic information
- Florida Department of Environmental Protection
- Florida Department of Health Polk County
- Florida Department of Transportation
- Florida Forest Service
- Florida Geologic Survey
- Florida Geological Survey information
- Florida Housing Data Clearinghouse – Polk County Profile
- Floridadisaster.org
- Fox 13 Tampa Bay
- Heartland 2060: Building a Resilient Region
- Hernando County Sheriff's Office
- Homeless Coalition of Polk County
- Johns Hopkins University
- Lakeland Vision
- Miami Herald
- National Climactic Data Center of National Oceanic and Atmospheric Administration www.ncdc.noaa.gov

SECTION IX: RESOURCES

- National Climatic Data Center storm reports
- National Inventory of Dams
- NRDC www.nrdc.org
- National Public Radio (NPR)
- Office of Economic and Demographic Research: www.edr.state.fl.us
- Patch www.patch.com
- Polk County Emergency Operations Center
- Polk County Property Appraiser
- Polk County Public Schools
- Polk County Transportation Planning Organization
- Polk Vision – www.polkvision.com
- Smart Growth America
- Tampa Bay Times
- The Ledger
- The NewsChief
- The Tampa Tribune
- The TORRO Hail Scale: The Tornado and Storm Research Organization: http://www.torro.org.uk/site/hscale.php
- Tornado History Project http://www.tornadohistoryproject.com/tornado/Florida/Polk/export
- Tornado information and maps: http://www.spc.noaa.gov/wcm/#data
- U.S. Census Bureau American Community Survey
- University of Florida Bureau of Business and Economic Research
- US Army Corp of Engineers, National Inventory of Dams

SECTION IX: RESOURCES

- USDA Economic Research Service: http://www.ers.usda.gov/data-products/atlas-of-rural-and-small-town-america/go-to-the-atlas.aspx
- USDA Farm Service Agency
- Vaisala - Lightning information
- Weather Underground: www.weatherunderground.com/climate
- WFLA
- Worldbarefootcetner.com
- WUSF
- www.ready.gov
- www.Wildfiretoday.com

APPENDICES

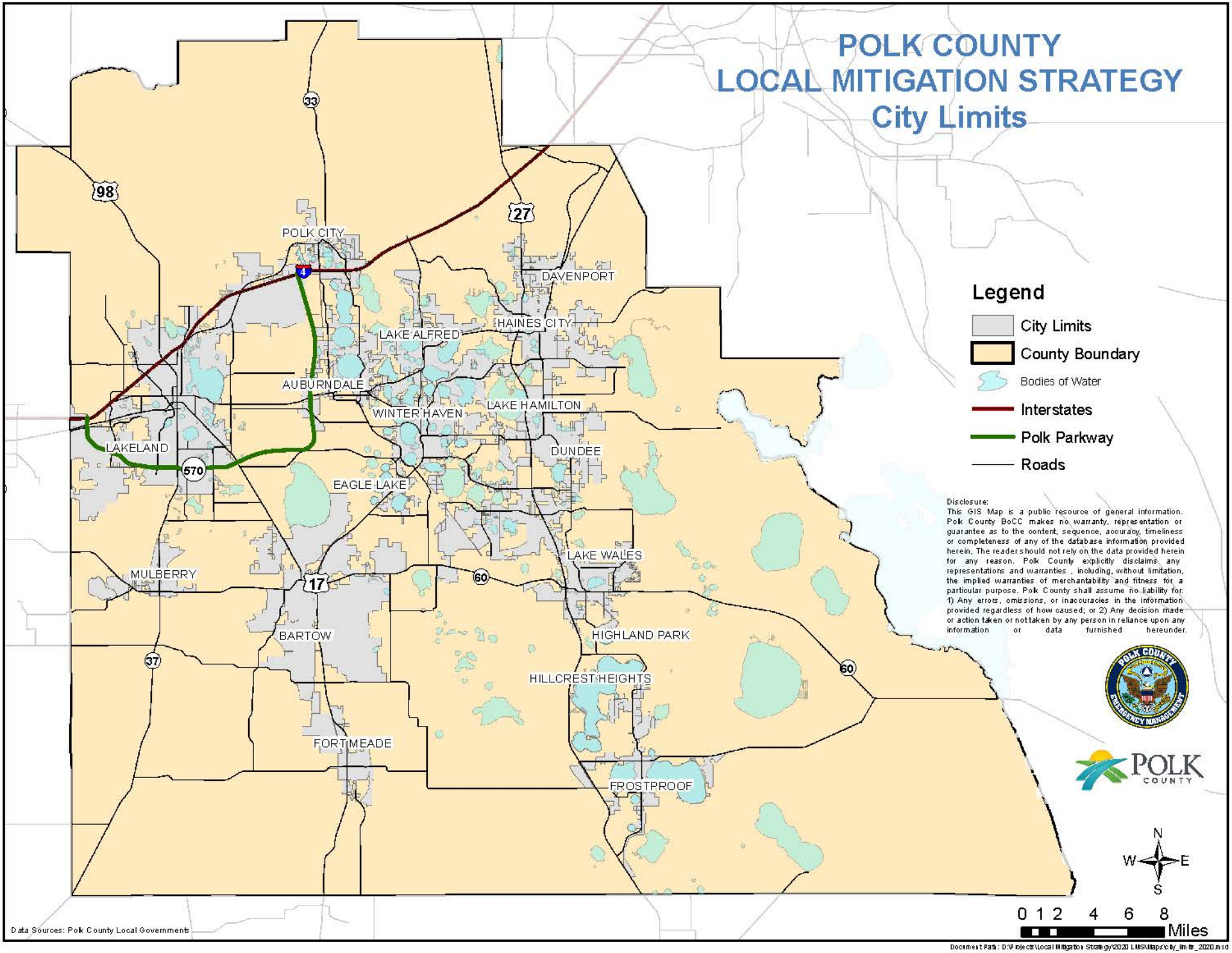
APPENDIX A

APPENDIX A – MAPS

Appendix A includes maps related to the LMS. The text includes many of these maps at a smaller scale. The appendix includes the following maps:

1. City Limits
2. Population Density
3. Population (Over 65) Density
4. Population Below Poverty Level
5. Limited English-Speaking Households
6. Site Built Home Density
7. Mobile Home Density
8. Vehicle Density
9. School Locations
10. Critical Facilities
11. Polk County CRS Map Series Repetitive Loss Areas
12. Hurricane Tracks
13. FEMA Flood Insurance Rate Map (FIRM)
14. Potential Roadway Flooding
15. Severe Thunderstorm Hail (1950-2018)
16. Severe Thunderstorms Wind (1950-2018)
17. Tornado Touchdowns (1950-2018)
18. Tornado Tracks by Intensity (1950-2018)
19. Wildland-Urban Interface (WUI) Fire Risk
20. Sinkhole Depths (1954-2019)
21. Sinkhole Area Types
22. Hazardous Materials Facilities
23. Existing and Proposed Pipeline Locations
24. Rail Lines and Crossings
25. Sections (TRS) Positive for Huanglongbing (HLB, Citrus Greening) in Florida
26. Known Distribution of Citrus Canker and Citrus Greening (HLB) in Florida (1/10/2017)
27. Winter Haven CHRP Area Citrus Greening and Canker (January 10, 2017)
28. Polk County Citrus Black Spit Quarantine Zone Map
29. Evacuation Routes
30. Pedestrian Crashes (2014-2019)
31. Bicycle Crashes (2014-2019)

POLK COUNTY
LOCAL MITIGATION STRATEGY
City Limits



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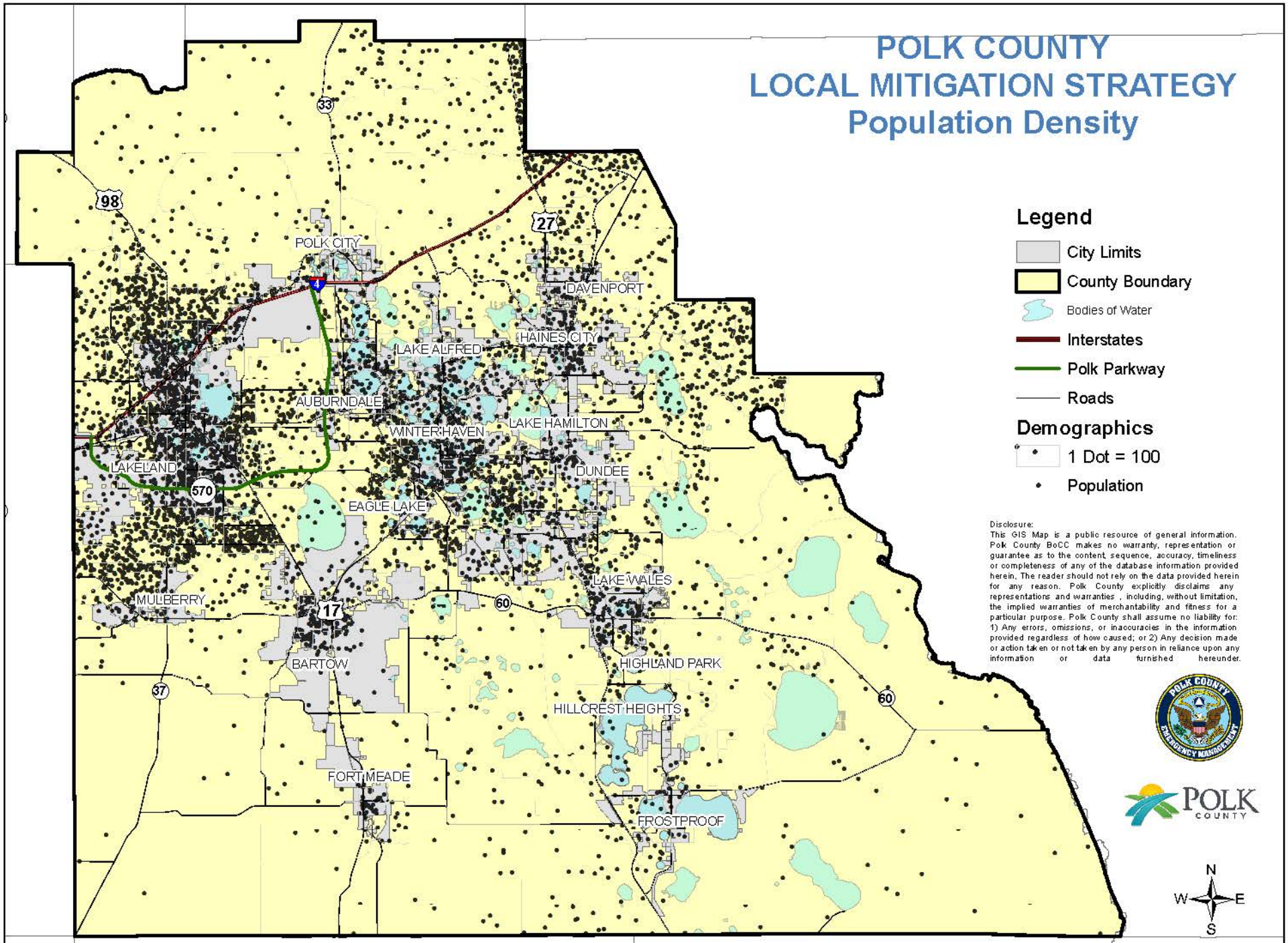
Data Sources: Polk County Local Governments

Document Path : D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\city_limits_2020.mxd

POLK COUNTY
LOCAL MITIGATION STRATEGY
Population Density



Legend

- City Limits
- County Boundary
- Bodies of Water
- Interstates
- Polk Parkway
- Roads

Demographics

- 1 Dot = 100
- Population

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POLK COUNTY EMERGENCY MANAGEMENT

POLK COUNTY

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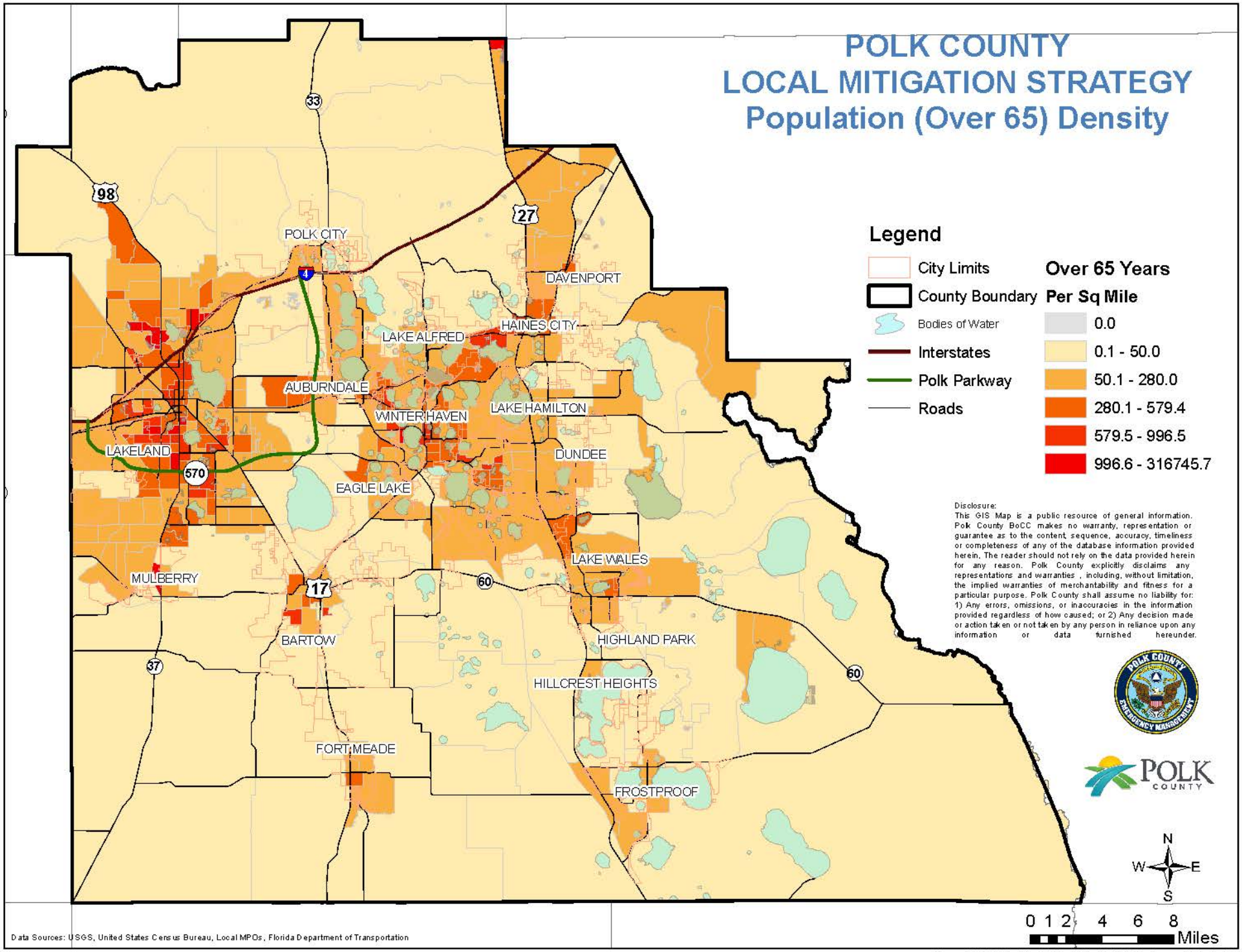
0 1 2 4 6 8
Miles

Data Sources: USGS, United States Census Bureau, Local MPOs, Florida Department of Transportation

Document Path : D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\demographic_Pop_Density_2020.mxd

POLK COUNTY
LOCAL MITIGATION STRATEGY
Population (Over 65) Density



Legend

	Over 65 Years Per Sq Mile
City Limits	
County Boundary	
Bodies of Water	0.0
Interstates	0.1 - 50.0
Polk Parkway	50.1 - 280.0
Roads	280.1 - 579.4
	579.5 - 996.5
	996.6 - 316745.7

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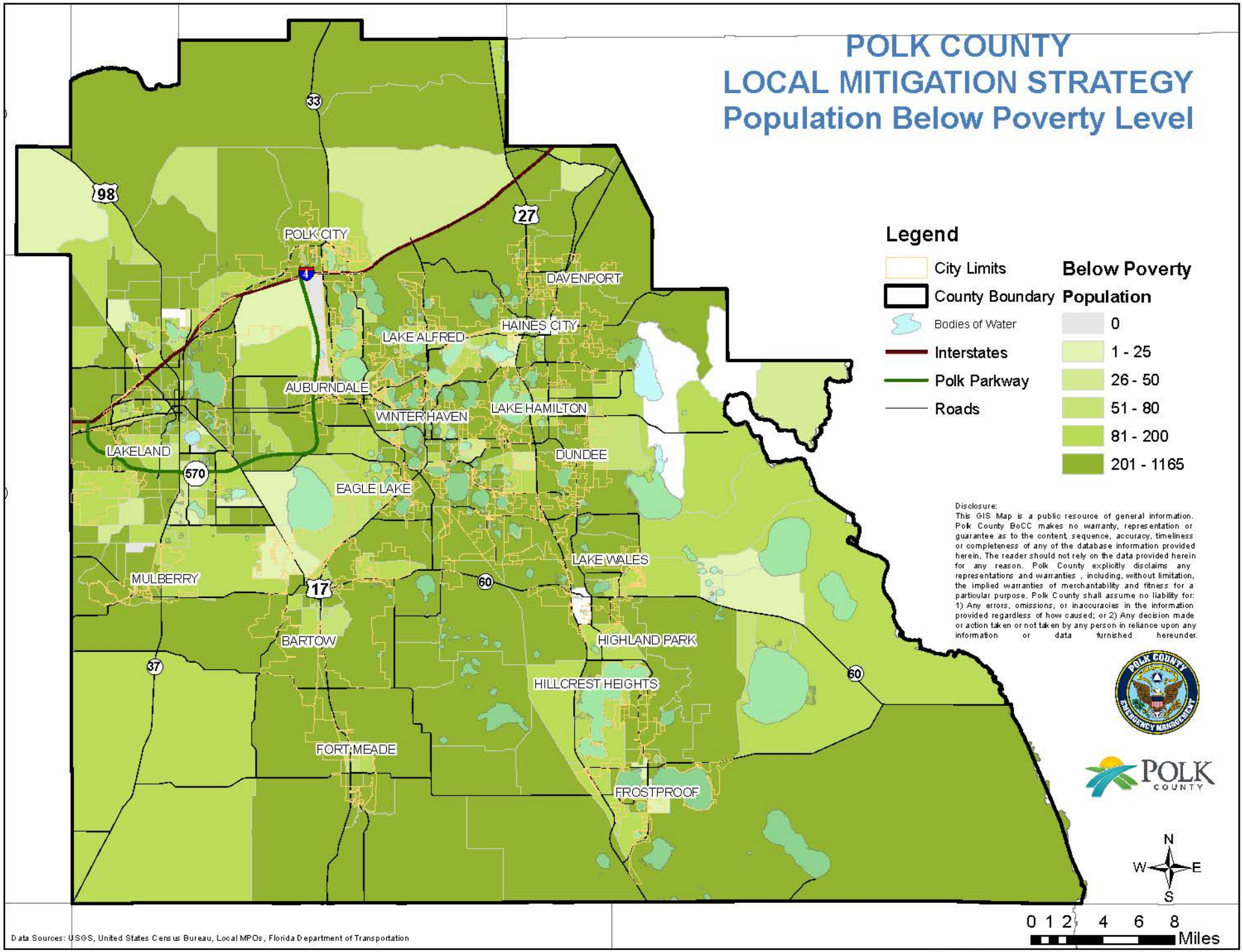
0 1 2 4 6 8
Miles

Data Sources: USGS, United States Census Bureau, Local MPOs, Florida Department of Transportation

Document Path : D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\demographic_PopOver65_Density_2020.mxd

POLK COUNTY
LOCAL MITIGATION STRATEGY
Population Below Poverty Level



Legend

City Limits	**Below Poverty Population**
County Boundary	
Bodies of Water	0
Interstates	1 - 25
Polk Parkway	26 - 50
Roads	51 - 80
	81 - 200
	201 - 1165

N
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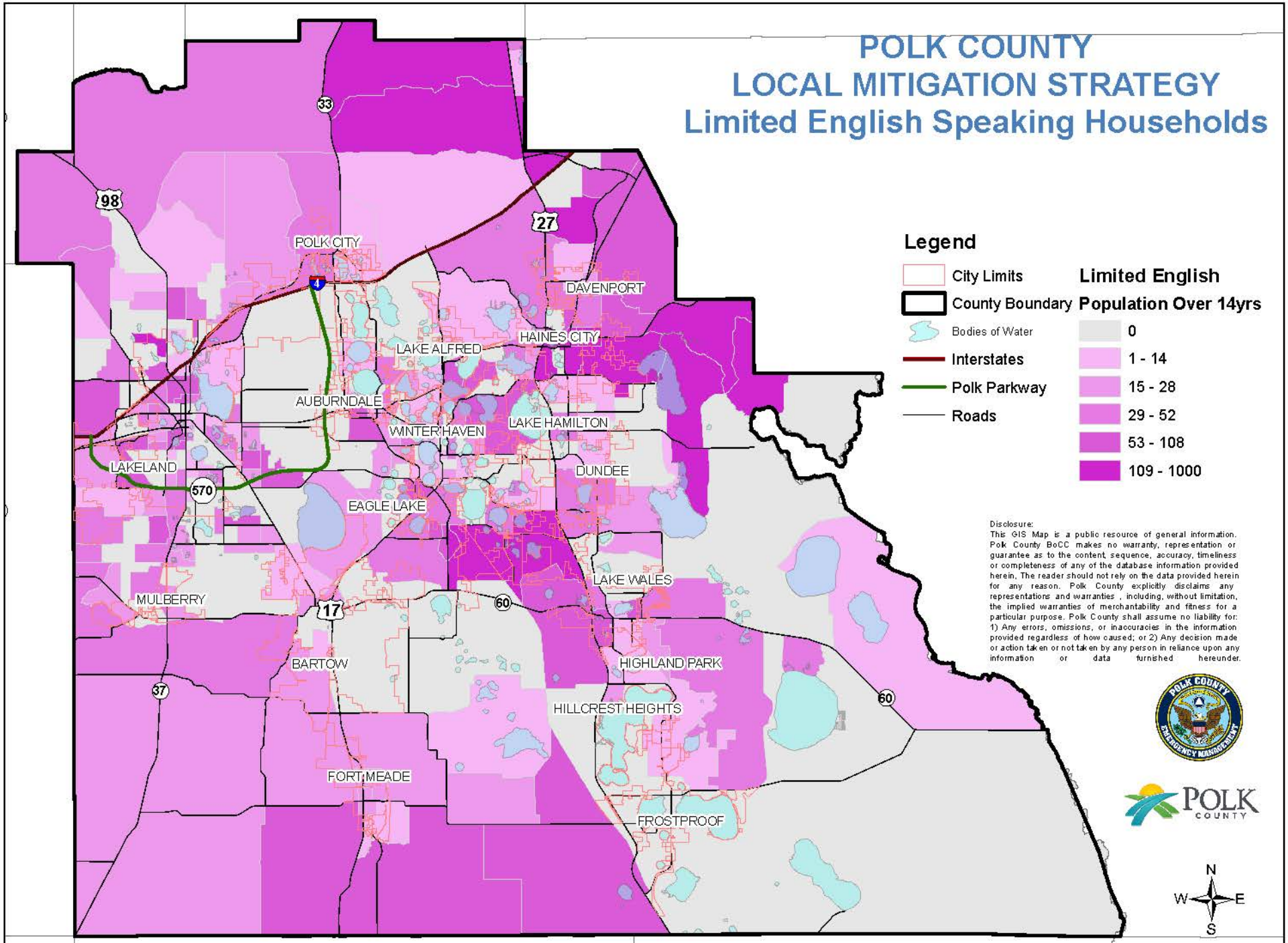
0 1 2 4 6 8 Miles

Data Sources: USGS, United States Census Bureau, Local MPOs, Florida Department of Transportation

Document Path: D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\demographic_BelowPoverty_2020.mxd

POLK COUNTY
LOCAL MITIGATION STRATEGY
Limited English Speaking Households



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Data Sources: USGS, United States Census Bureau, Local MPOs, Florida Department of Transportation

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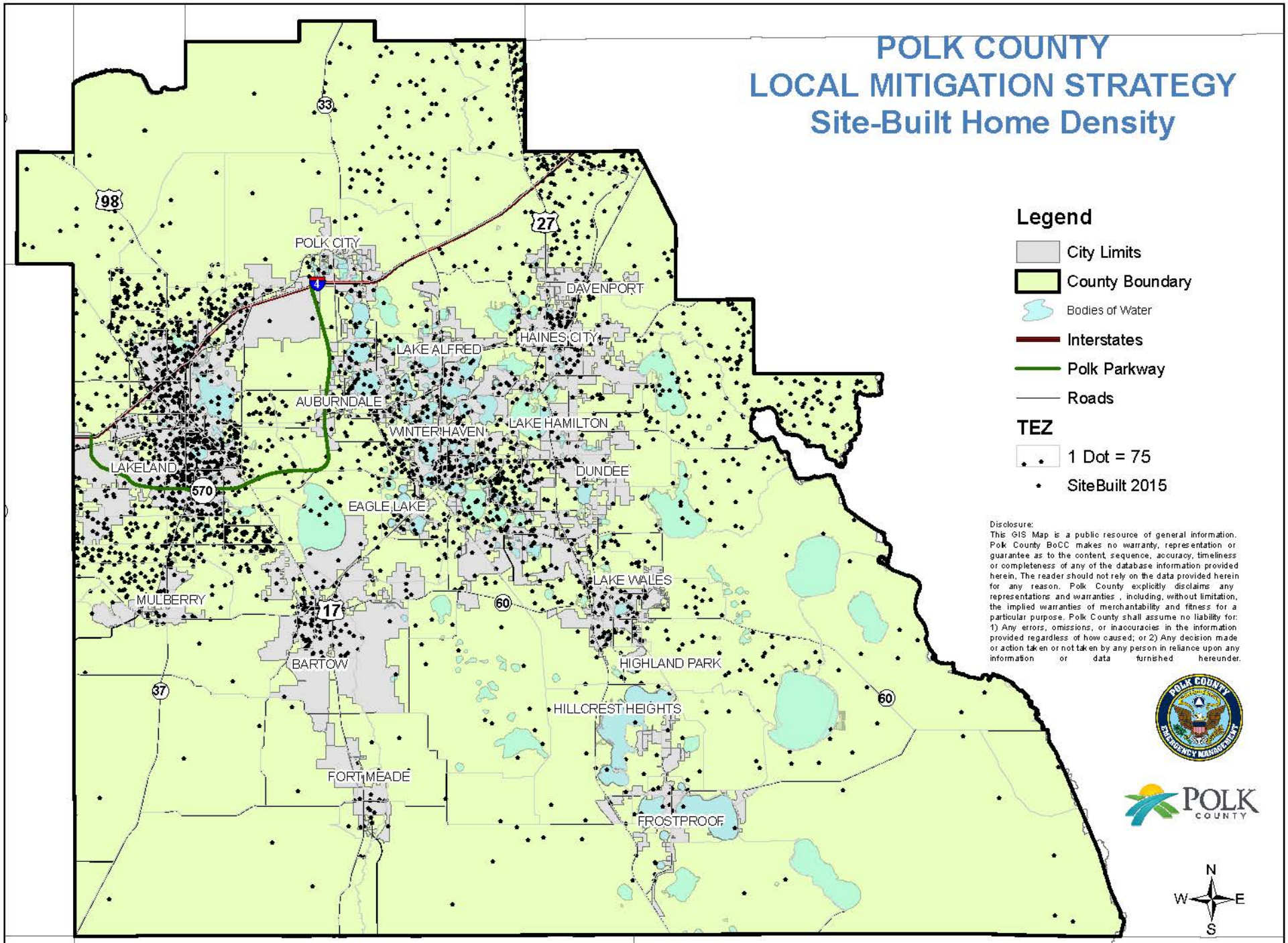
POLK COUNTY
LOCAL MITIGATION STRATEGY
Site-Built Home Density



Legend

- City Limits
- County Boundary
- Bodies of Water
- Interstates
- Polk Parkway
- Roads

TEZ

- 1 Dot = 75
- SiteBuilt 2015

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POLK COUNTY EMERGENCY MANAGEMENT

POLK COUNTY

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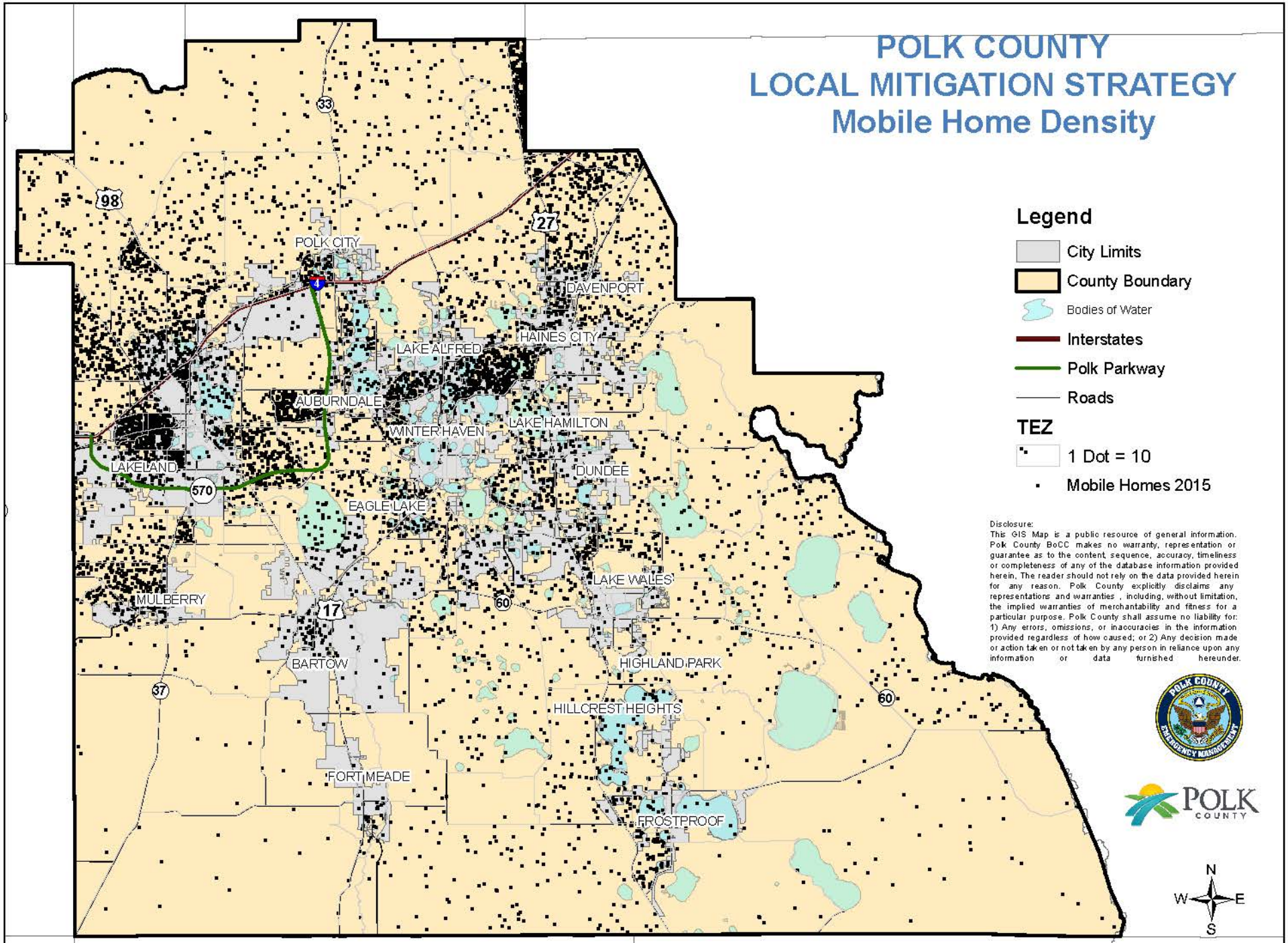
0 1 2 4 6 8
Miles

Data Sources: USGS, United States Census Bureau, Local MPOs, Florida Department of Transportation

Document Path: D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\demographic_SiteBuiltHome_Density_2020.mxd

POLK COUNTY
LOCAL MITIGATION STRATEGY
Mobile Home Density



Legend

- City Limits
- County Boundary
- Bodies of Water
- Interstates
- Polk Parkway
- Roads

TEZ

- 1 Dot = 10
- Mobile Homes 2015

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N
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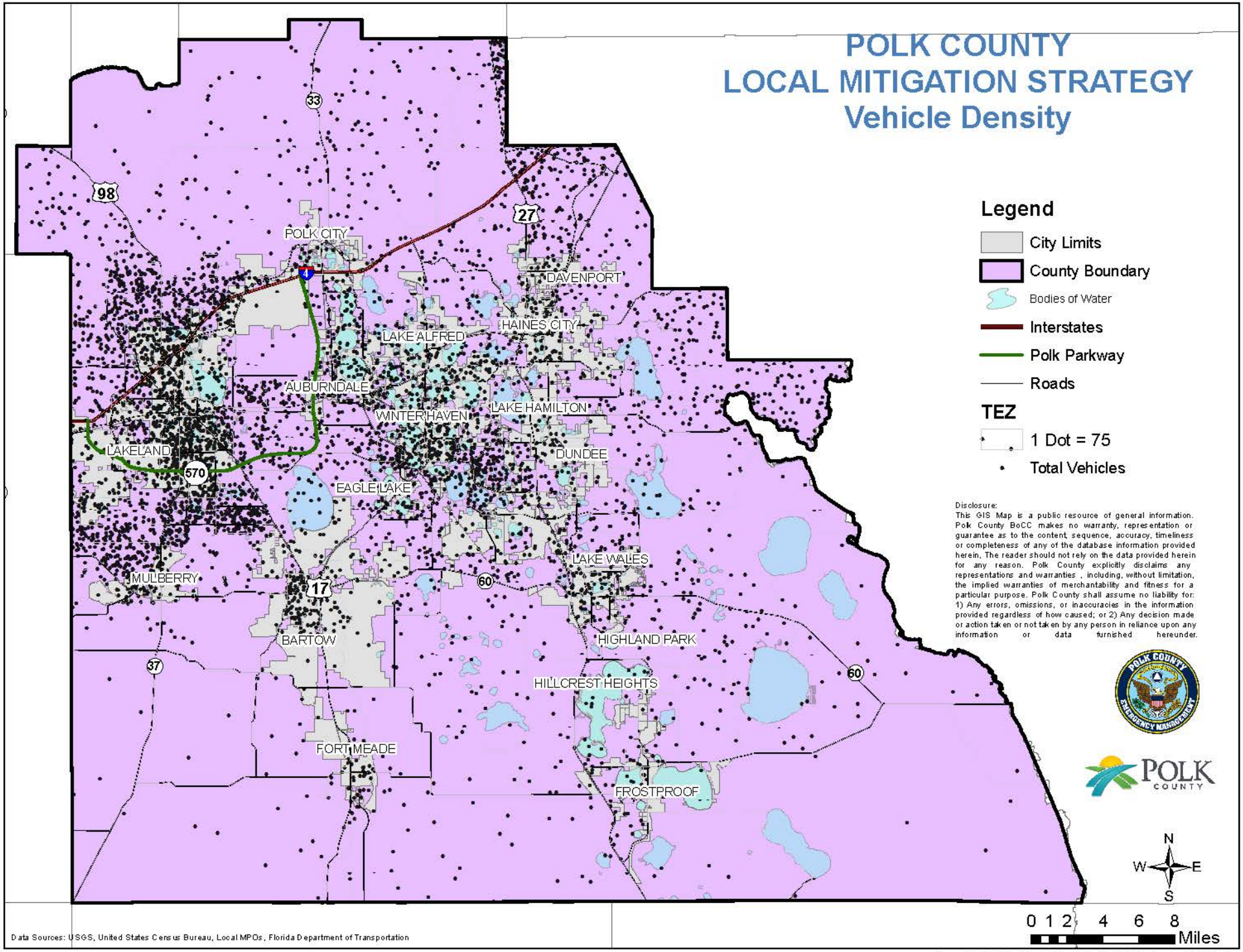
0 1 2 4 6 8
Miles

Data Sources: USGS, United States Census Bureau, Local MPOs, Florida Department of Transportation

Document Path : D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\demographic_Mobile Home_Density_2020.mxd

POLK COUNTY
LOCAL MITIGATION STRATEGY
Vehicle Density



Legend

- City Limits
- County Boundary
- Bodies of Water
- Interstates
- Polk Parkway
- Roads

TEZ

- 1 Dot = 75
- Total Vehicles

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N
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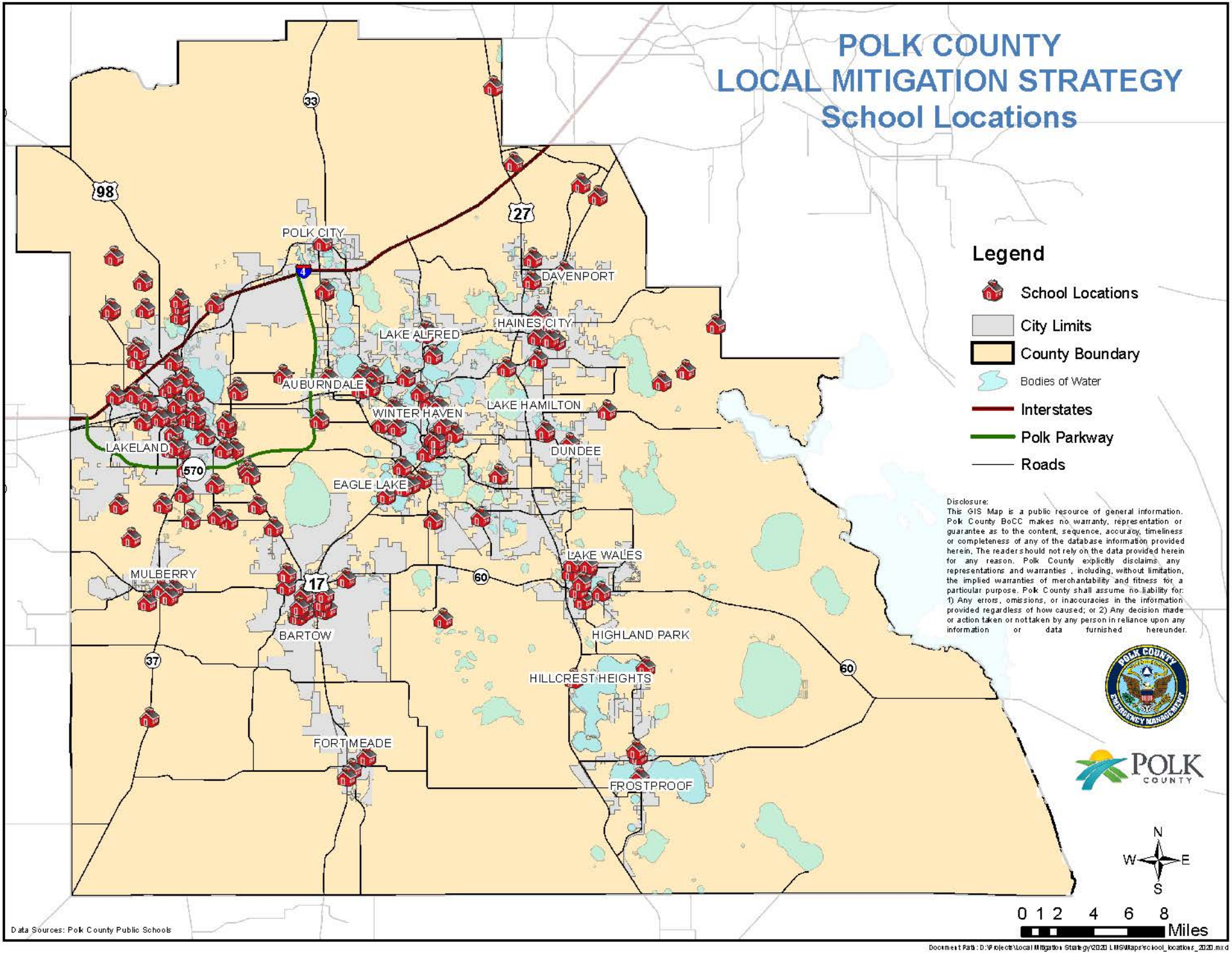
0 1 2 4 6 8
Miles

Data Sources: USGS, United States Census Bureau, Local MPOs, Florida Department of Transportation

Document Path : D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\demographic_Vehicle_Density_2020.mxd


POLK COUNTY
LOCAL MITIGATION STRATEGY
School Locations
Legend
School Locations
City Limits
County Boundary
Bodies of Water
Interstates
Polk Parkway
Roads
Disclosure:
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POLK COUNTY EMERGENCY MANAGEMENT
POLK COUNTY
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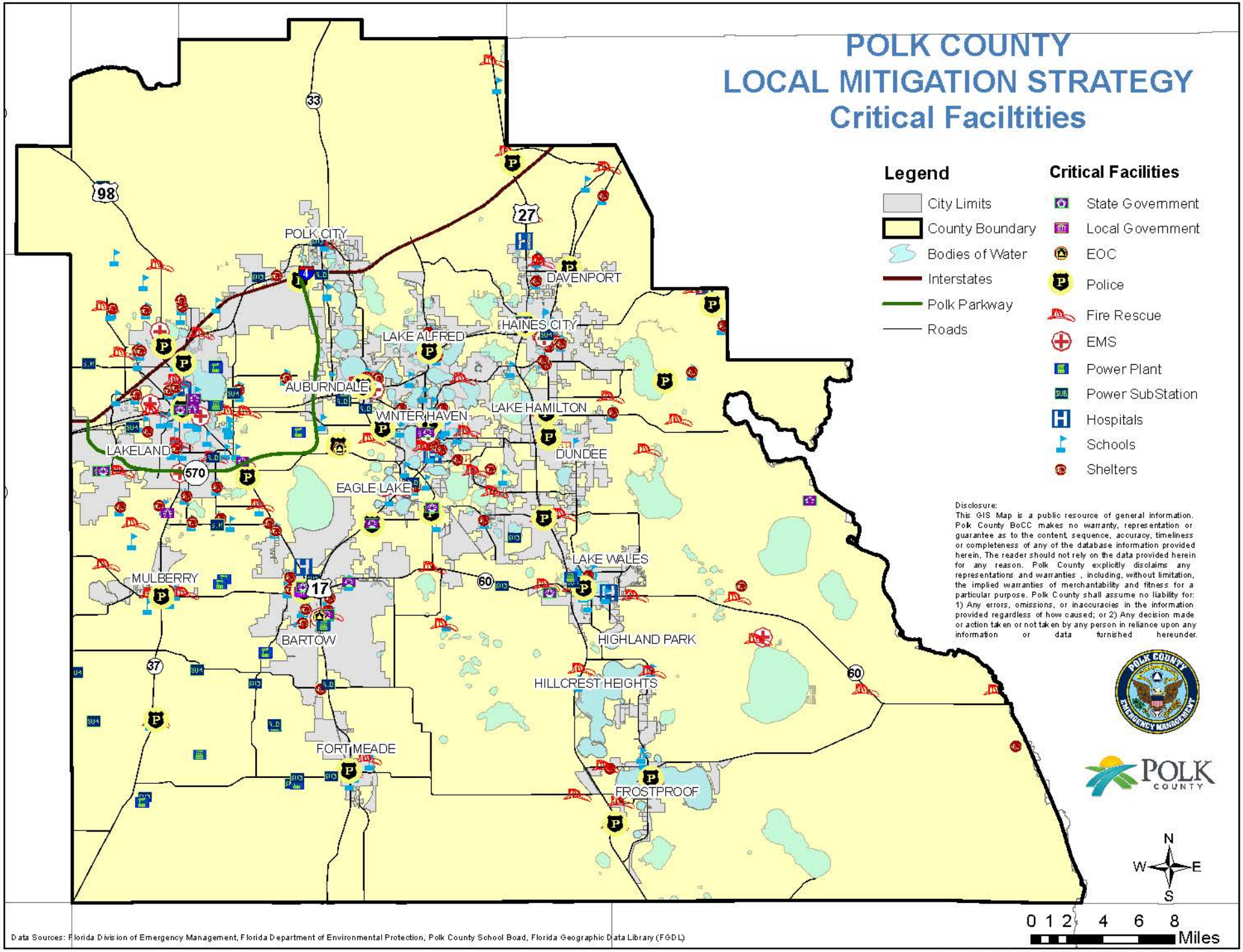
Miles
POLK CITY
DAVENPORT
HAINES CITY
LAKE ALFRED
AUBURNDALE
WINTER HAVEN
LAKE HAMILTON
DUNDEE
LAKELAND
EAGLE LAKE
LAKE WALES
MULBERRY
BARTOW
HIGHLAND PARK
HILLCREST HEIGHTS
FORT MEADE
FROSTPROOF
33
98
27
4
570
17
60
37
Data Sources: Polk County Public Schools
Document Path : D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\school_locations_2020.mxd

POLK COUNTY
LOCAL MITIGATION STRATEGY
Critical Faciltities



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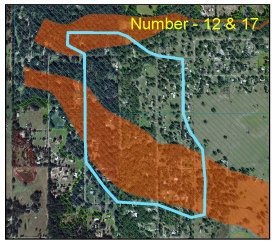
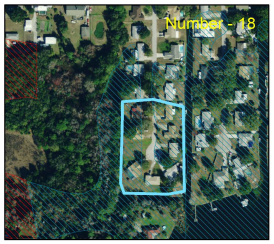
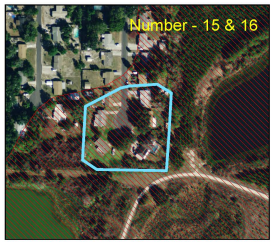
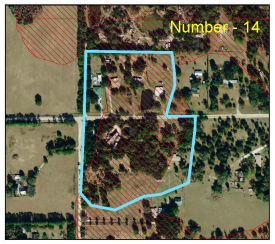
Data Sources: Florida Division of Emergency Management; Florida Department of Environmental Protection, Polk County School Boad, Florida Geographic Data Library (FGDL)

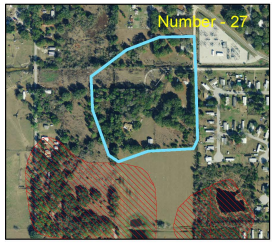
Document Path: D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\critical_facilities_2020.mxd

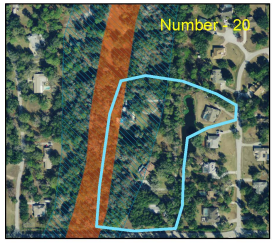


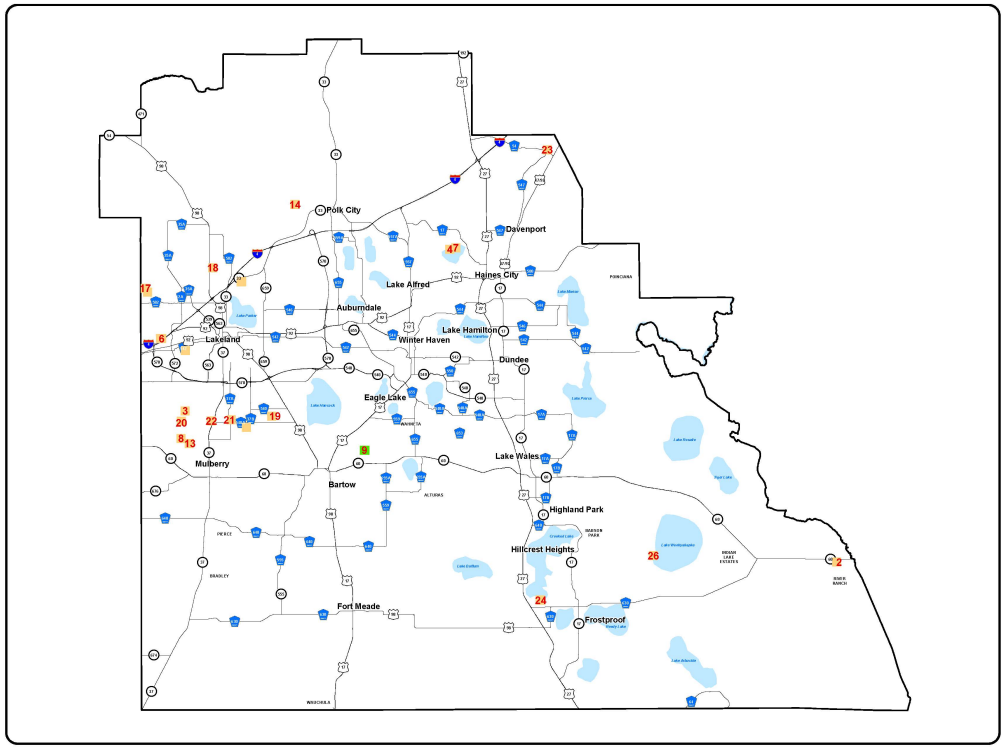


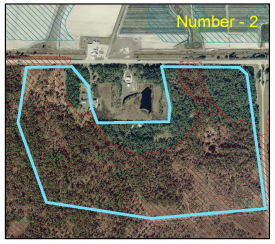


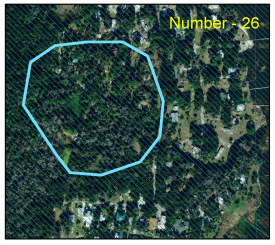


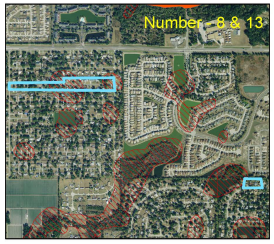


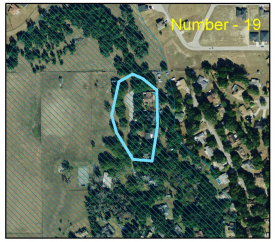


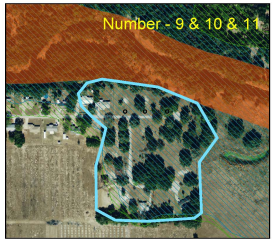












POLK COUNTY CRS MAP SERIES

Repetitive Loss Areas Activity 502

Legend

- FEMA Floodways
- Flood Zone A
- Flood Zone AE
- Flood Zone AH
- Flood Zone X5
- Major Waterbodies
- Major Roads
- Repetative Loss - Notify
- Repetitive Loss Sites
- County Purchased
- Reptetive Loss Area
- Municipalities
- County Boundary

Aerial Source:
2009 Sothwest Florida Water Management District

Repetitve Loss Areas based on topography.

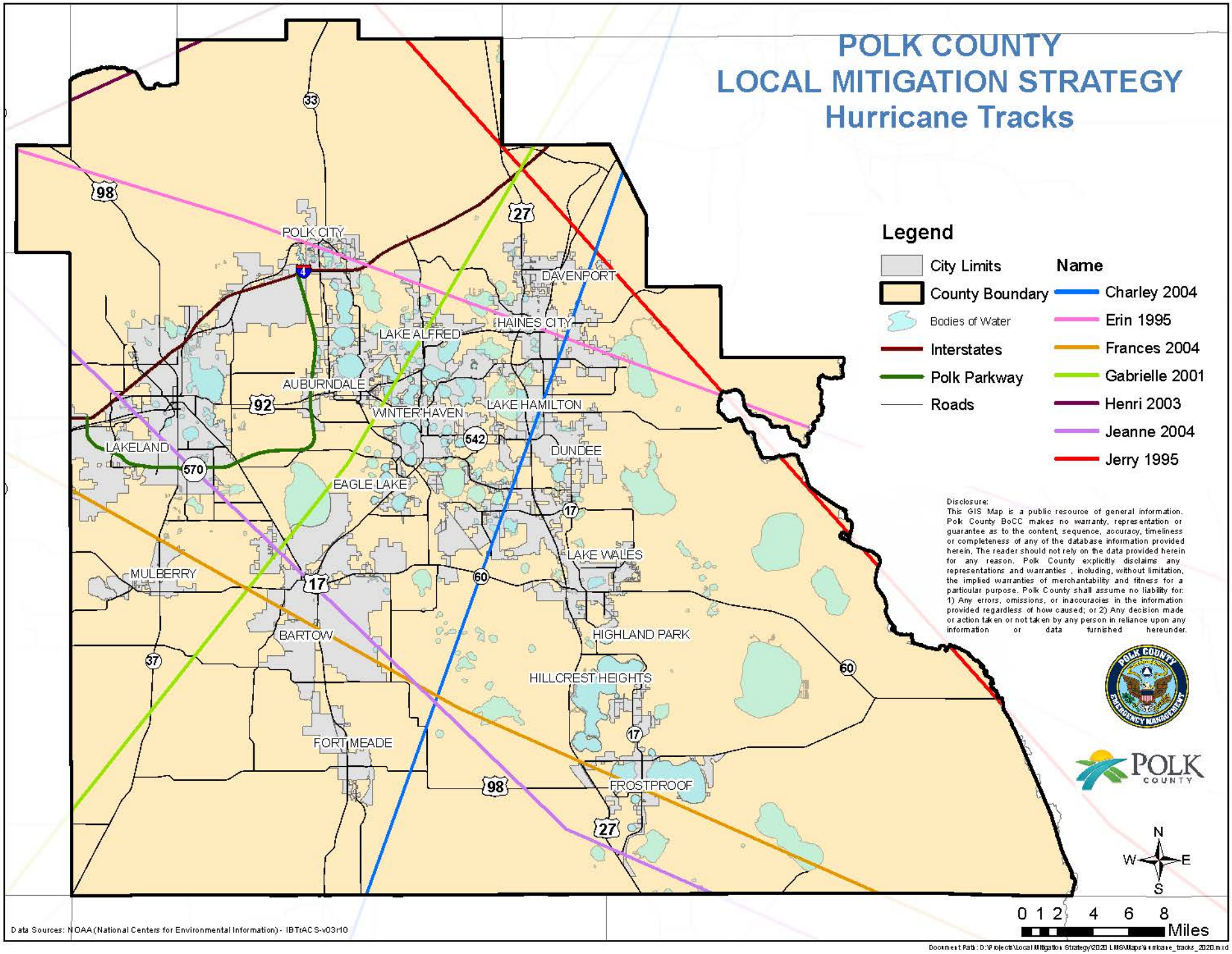
If you have any comments or questions regarding the map, please contact Randall Vogel at 863-534-6767 or randalvogel@polk-county.net

Prepared by:
Polk County
Board of County Commissioners
Growth Management Department
April 2010

N

0 2.5 5 10 15 20
Miles

POLK COUNTY
LOCAL MITIGATION STRATEGY
Hurricane Tracks



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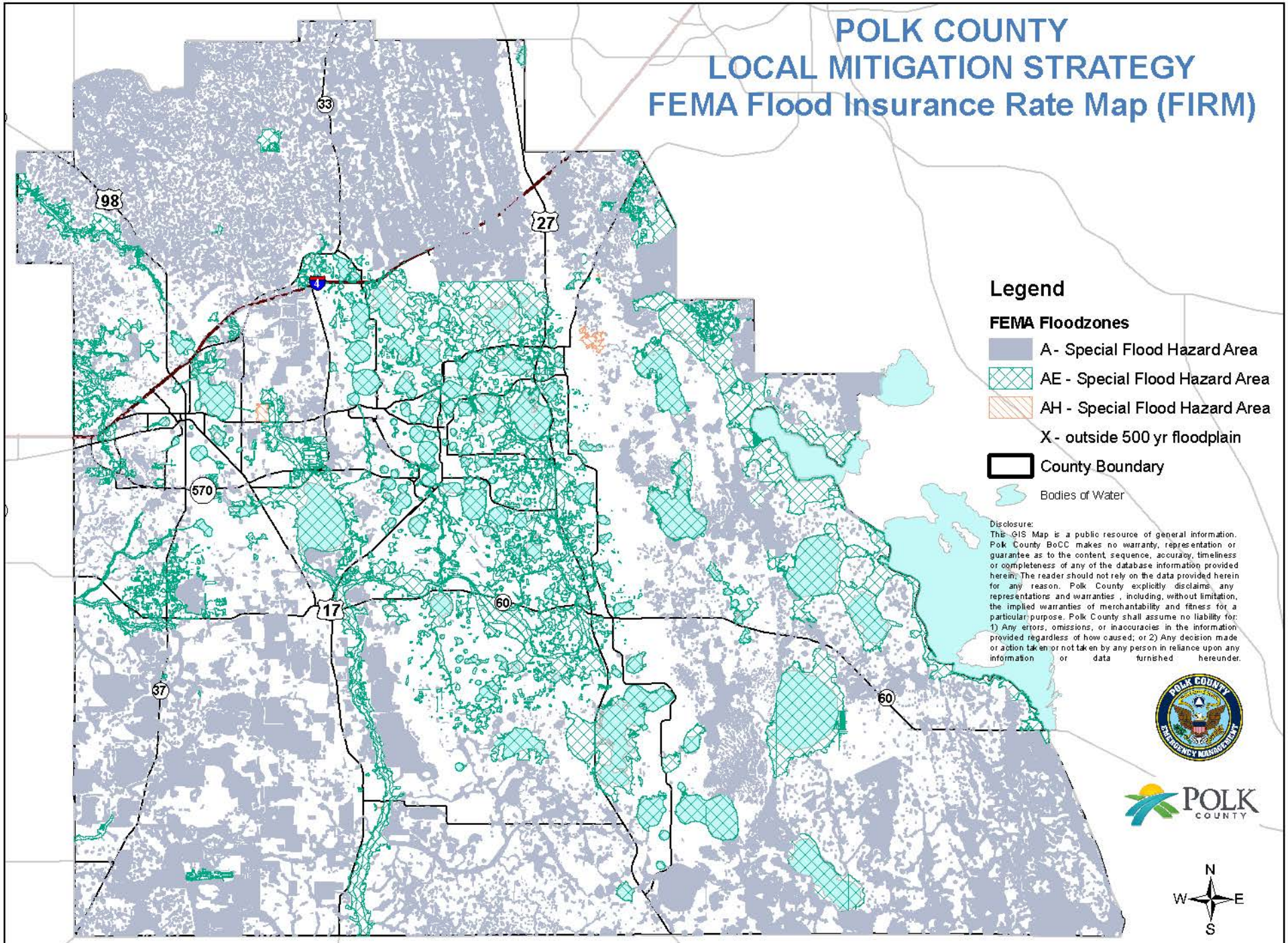
Data Sources: NOAA (National Centers for Environmental Information) - IBTrACS-v03r10

Document Path : D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\Hurricane_tracks_2020.mxd

POLK COUNTY
LOCAL MITIGATION STRATEGY
FEMA Flood Insurance Rate Map (FIRM)



Legend

FEMA Floodzones

- A - Special Flood Hazard Area
- AE - Special Flood Hazard Area
- AH - Special Flood Hazard Area
- X - outside 500 yr floodplain
- County Boundary
- Bodies of Water

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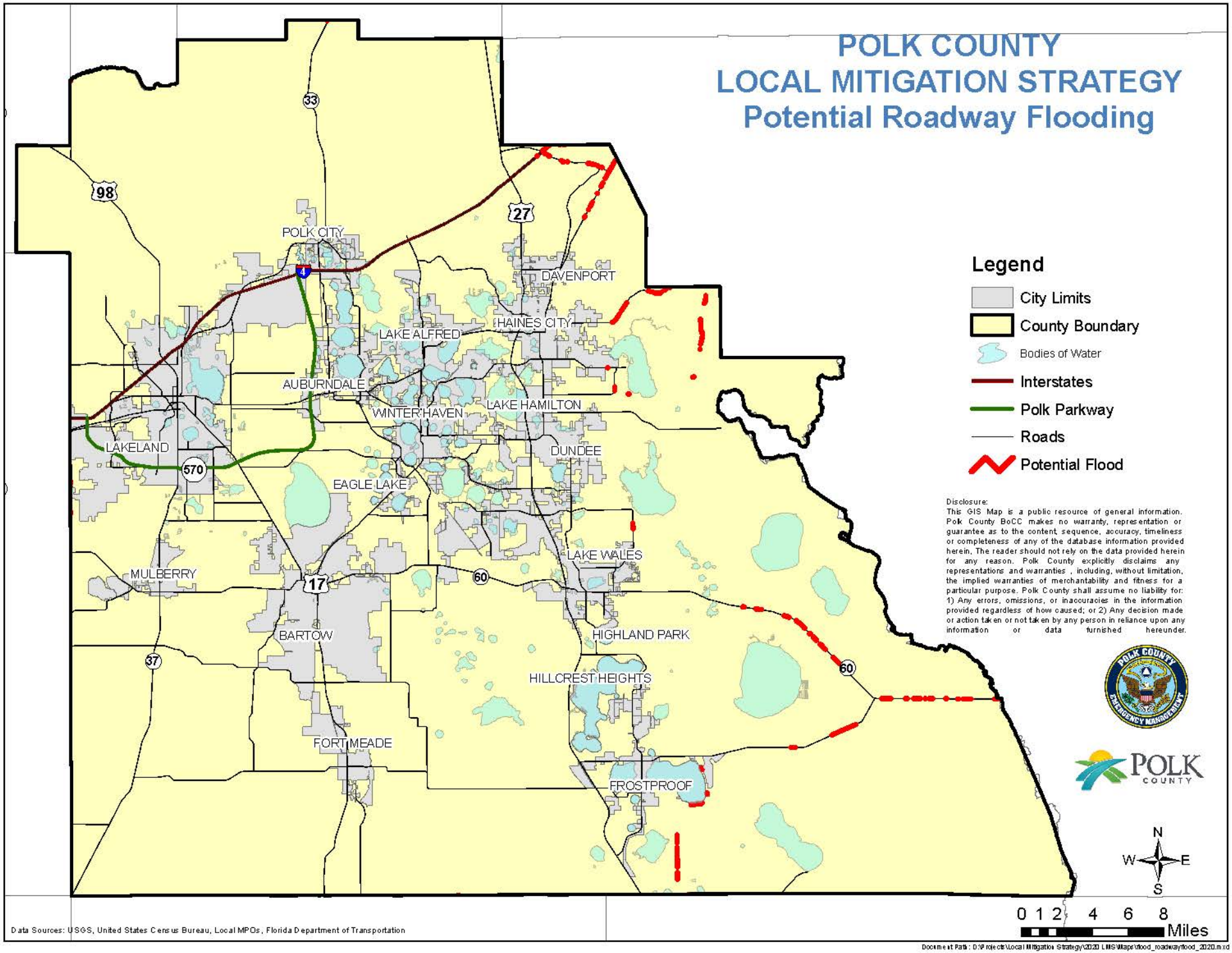
Miles

Data Sources: Federal Emergency Management Agency (FEMA) Flood Insurnace Rate Map (FIRM), updated 2016

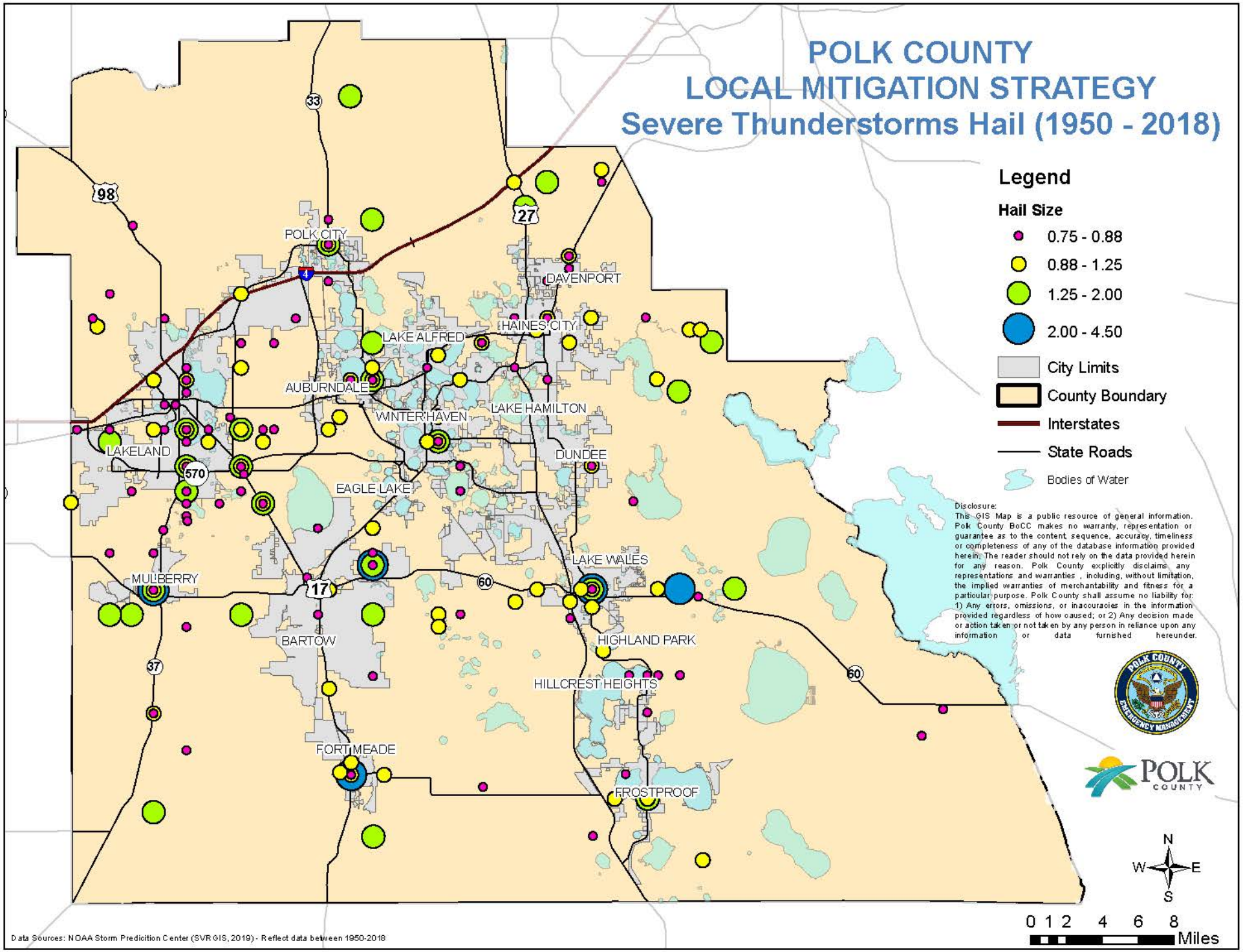
Document Path : D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\flood_floodplain_2020.mxd

POLK COUNTY
LOCAL MITIGATION STRATEGY
Potential Roadway Flooding



Data Sources: USGS, United States Census Bureau, Local MPOs, Florida Department of Transportation

Document Path: D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\flood_roadwayflood_2020.mxd


POLK COUNTY
LOCAL MITIGATION STRATEGY
Severe Thunderstorms Hail (1950 - 2018)
Legend
Hail Size
0.75 - 0.88
0.88 - 1.25
1.25 - 2.00
2.00 - 4.50
City Limits
County Boundary
Interstates
State Roads
Bodies of Water
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POLK COUNTY EMERGENCY MANAGEMENT
POLK COUNTY
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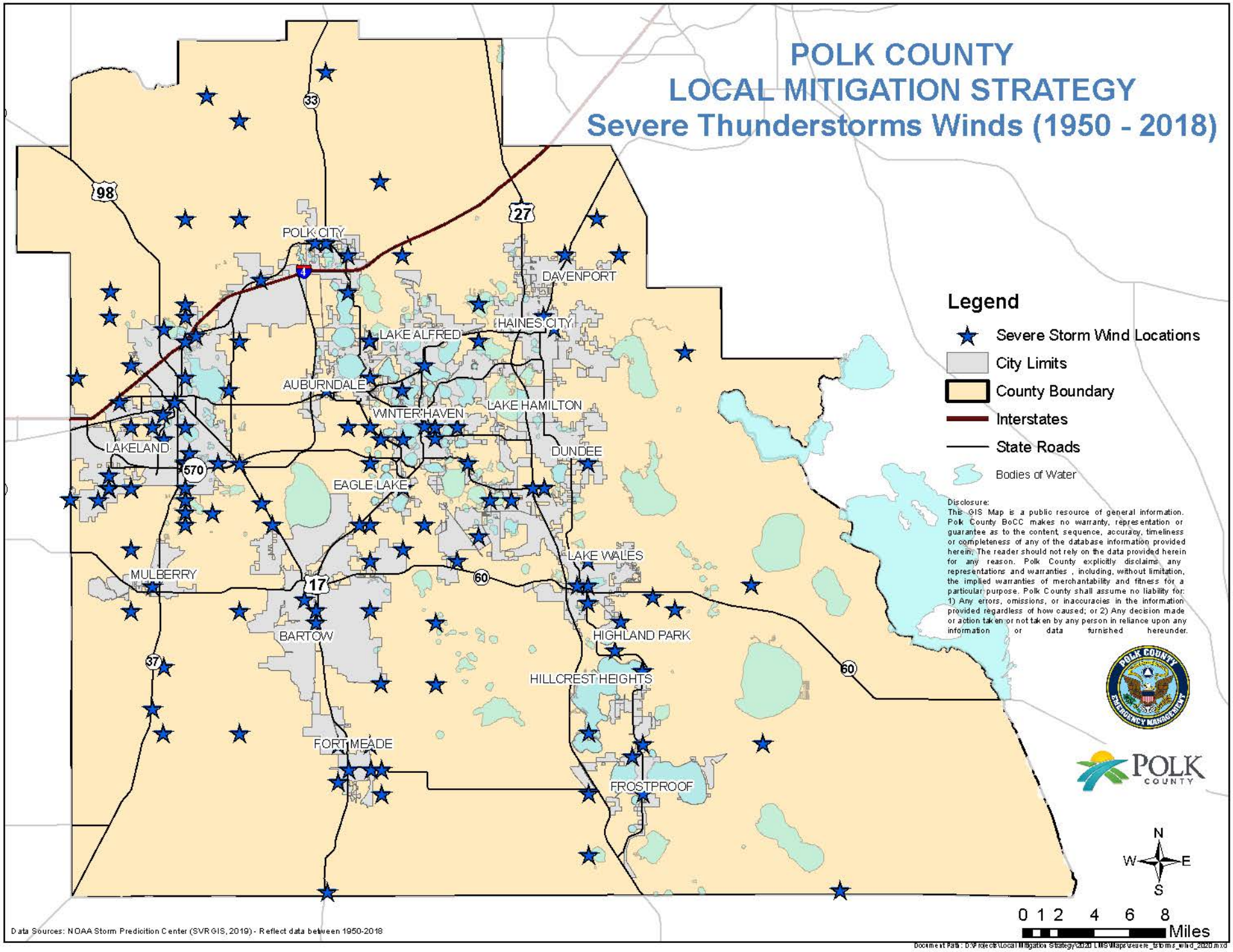
Miles
POLK CITY
DAVENPORT
HAINES CITY
LAKE ALFRED
AUBURNDALE
WINTER HAVEN
LAKE HAMILTON
LAKELAND
DUNDEE
EAGLE LAKE
LAKE WALES
MULBERRY
BARTOW
HIGHLAND PARK
HILLCREST HEIGHTS
FORT MEADE
FROSTPROOF
98
33
27
4
570
17
60
37
Data Sources: NOAA Storm Predicition Center (SVRGIS, 2019) - Reflect data between 1950-2018
Document Path: D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\severe_tstorm_hail_size_2020.mxd

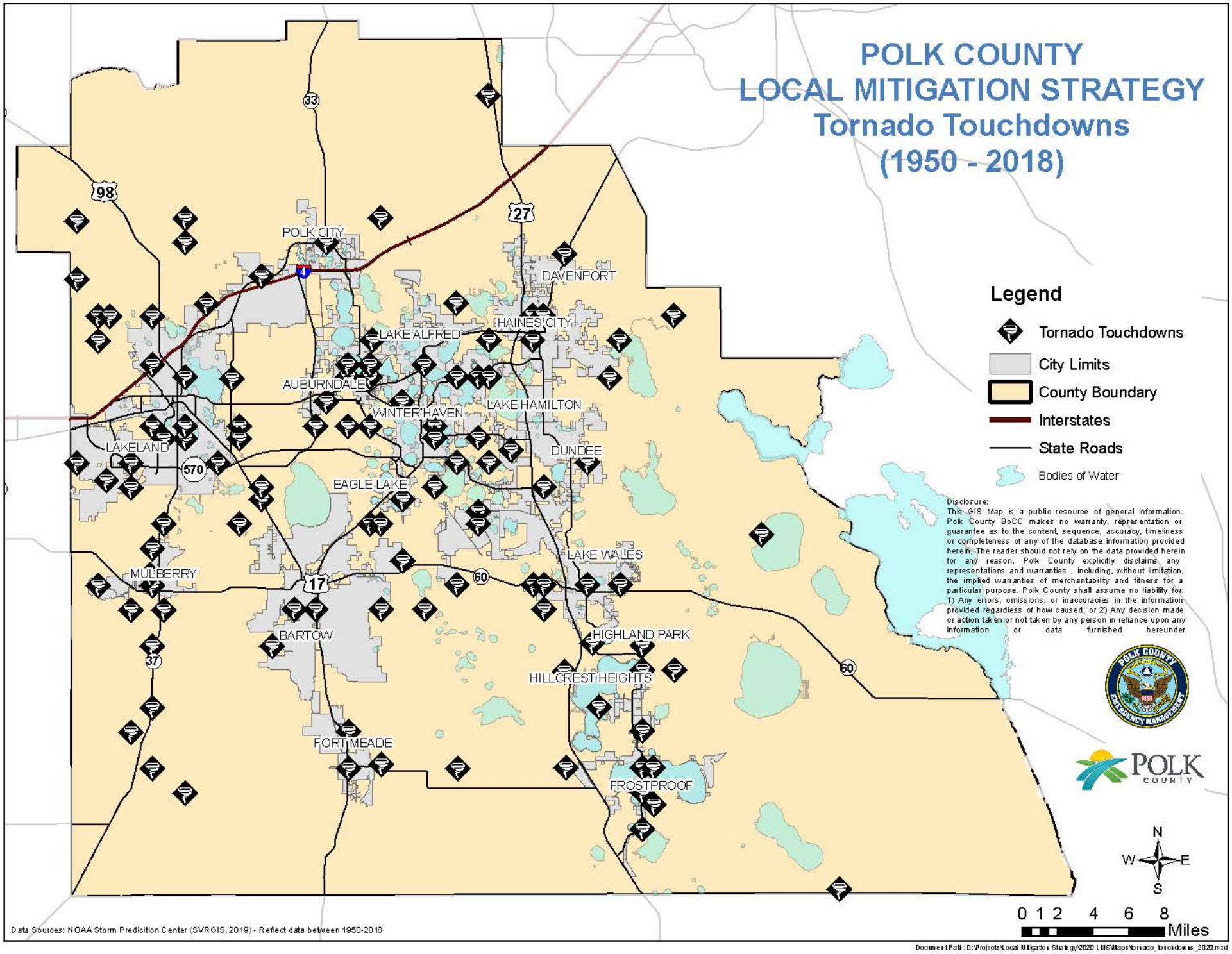
POLK COUNTY
LOCAL MITIGATION STRATEGY
Severe Thunderstorms Winds (1950 - 2018)



Data Sources: NOAA Storm Predicition Center (SVR GIS, 2019) - Reflect data between 1950-2018

Document Path : D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\severe_tstorms_wind_2020.mxd

POLK COUNTY
LOCAL MITIGATION STRATEGY
Tornado Touchdowns
(1950 - 2018)



Legend

- Tornado Touchdowns
- City Limits
- County Boundary
- Interstates
- State Roads
- Bodies of Water

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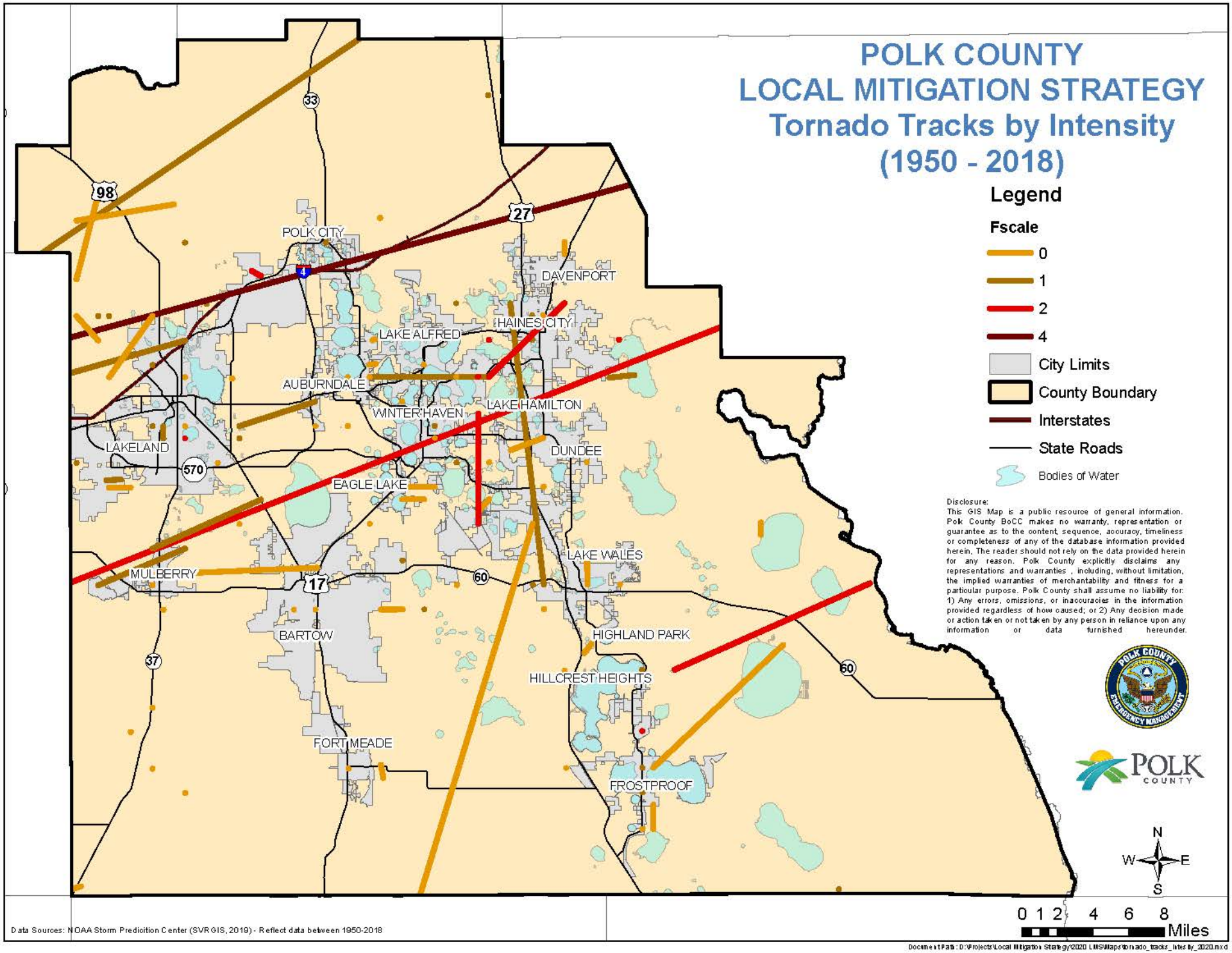
Data Sources: NOAA Storm Predicition Center (SVRGIS, 2019) - Reflect data between 1950-2018

Document Path: D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\tornado_touchdowns_2020.mxd


POLK COUNTY
LOCAL MITIGATION STRATEGY
Tornado Tracks by Intensity
(1950 - 2018)
Legend
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4
City Limits
County Boundary
Interstates
State Roads
Bodies of Water
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POLK CITY
DAVENPORT
HAINES CITY
LAKE ALFRED
AUBURNDALE
WINTER HAVEN
LAKE HAMILTON
LAKELAND
DUNDEE
EAGLE LAKE
LAKE WALES
MULBERRY
BARTOW
HIGHLAND PARK
HILLCREST HEIGHTS
FORT MEADE
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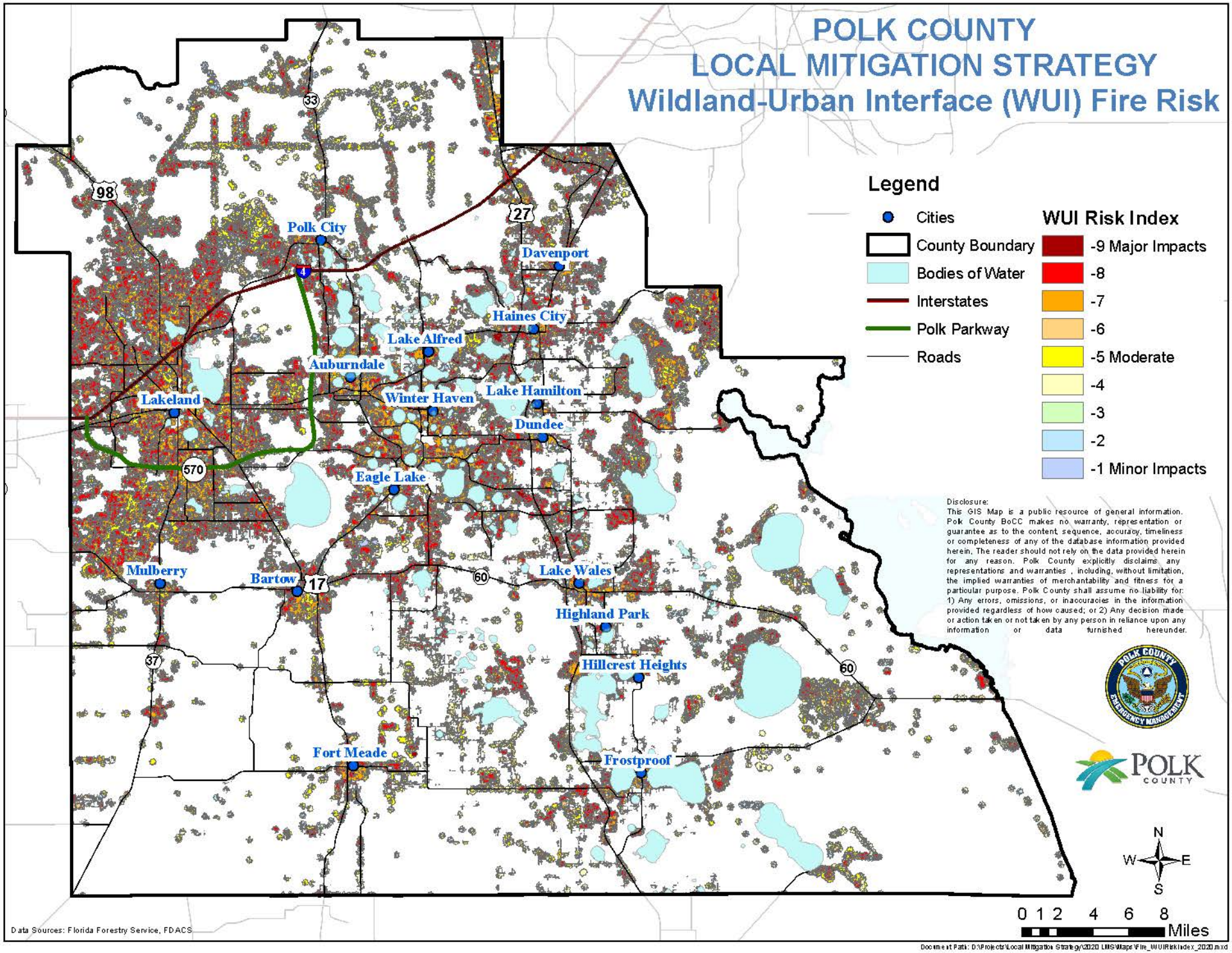
Data Sources: NOAA Storm Predicition Center (SVRGIS, 2019) - Reflect data between 1950-2018
Document Path : D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\tornado_tracks_intesity_2020.mxd

POLK COUNTY
LOCAL MITIGATION STRATEGY
Wildland-Urban Interface (WUI) Fire Risk



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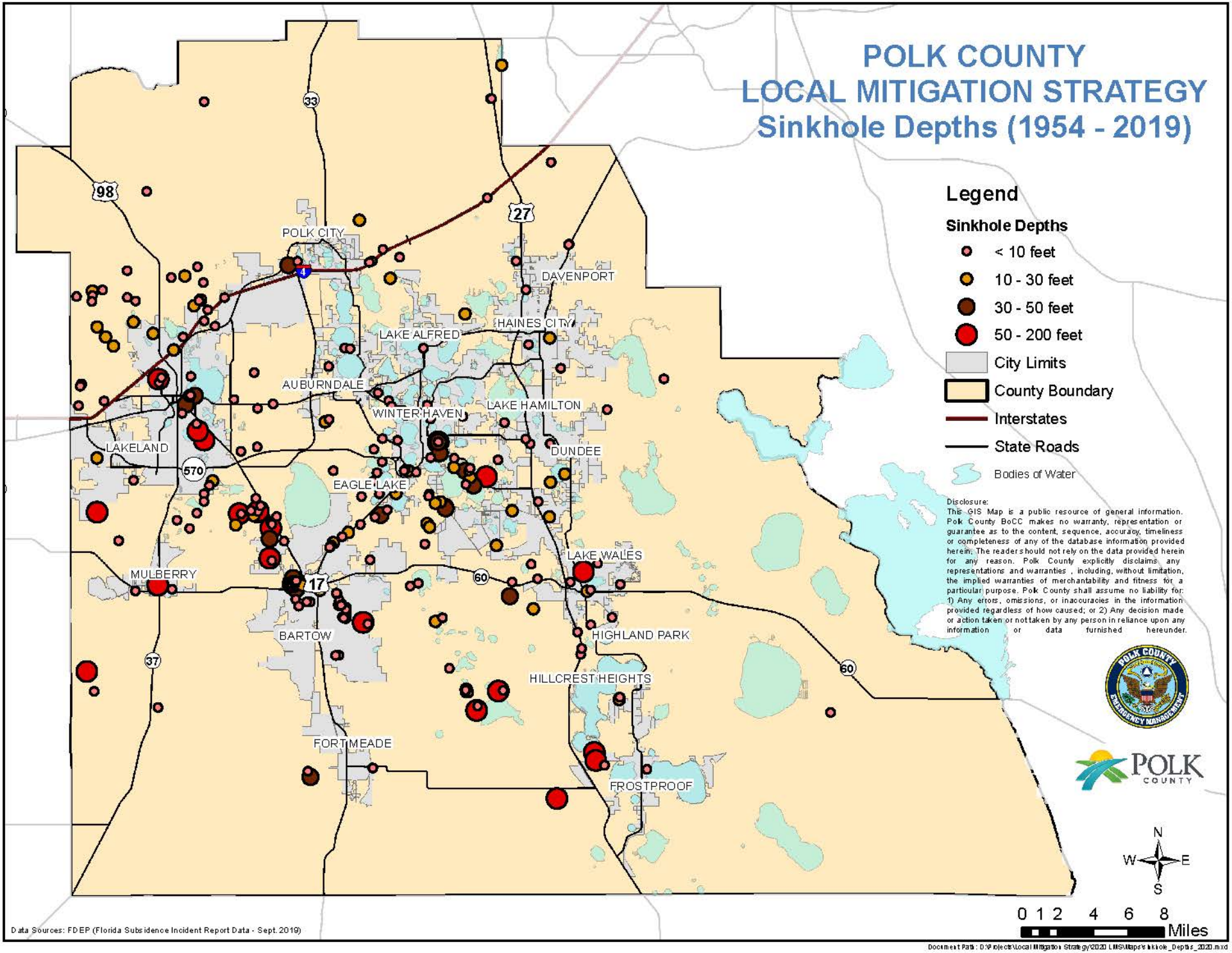
Data Sources: Florida Forestry Service, FDACS

Document Path: D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\Fire_WUIRiskIndex_2020.mxd


POLK COUNTY
LOCAL MITIGATION STRATEGY
Sinkhole Depths (1954 - 2019)
Legend
Sinkhole Depths
< 10 feet
10 - 30 feet
30 - 50 feet
50 - 200 feet
City Limits
County Boundary
Interstates
State Roads
Bodies of Water
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POLK COUNTY EMERGENCY MANAGEMENT
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HAINES CITY
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AUBURNDALE
WINTER HAVEN
LAKE HAMILTON
LAKELAND
DUNDEE
EAGLE LAKE
LAKE WALES
MULBERRY
BARTOW
HIGHLAND PARK
HILLCREST HEIGHTS
FORT MEADE
FROSTPROOF
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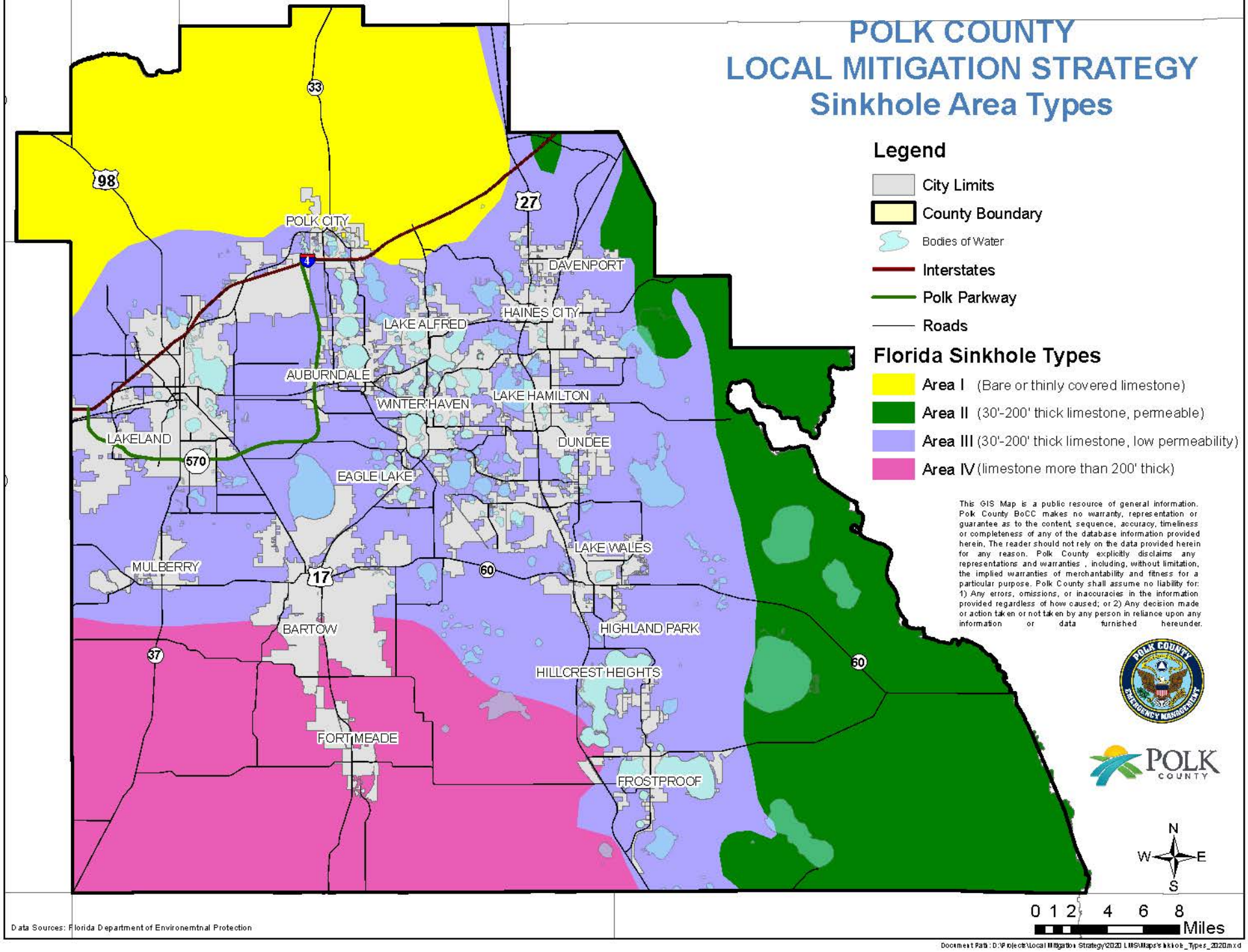
Data Sources: FDEP (Florida Subsidence Incident Report Data - Sept. 2019)
Document Path : D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\Sinkhole_Depths_2020.mxd

POLK COUNTY
LOCAL MITIGATION STRATEGY
Sinkhole Area Types



Legend

- City Limits
- County Boundary
- Bodies of Water
- Interstates
- Polk Parkway
- Roads

Florida Sinkhole Types

- Area I (Bare or thinly covered limestone)
- Area II (30'-200' thick limestone, permeable)
- Area III (30'-200' thick limestone, low permeability)
- Area IV (limestone more than 200' thick)

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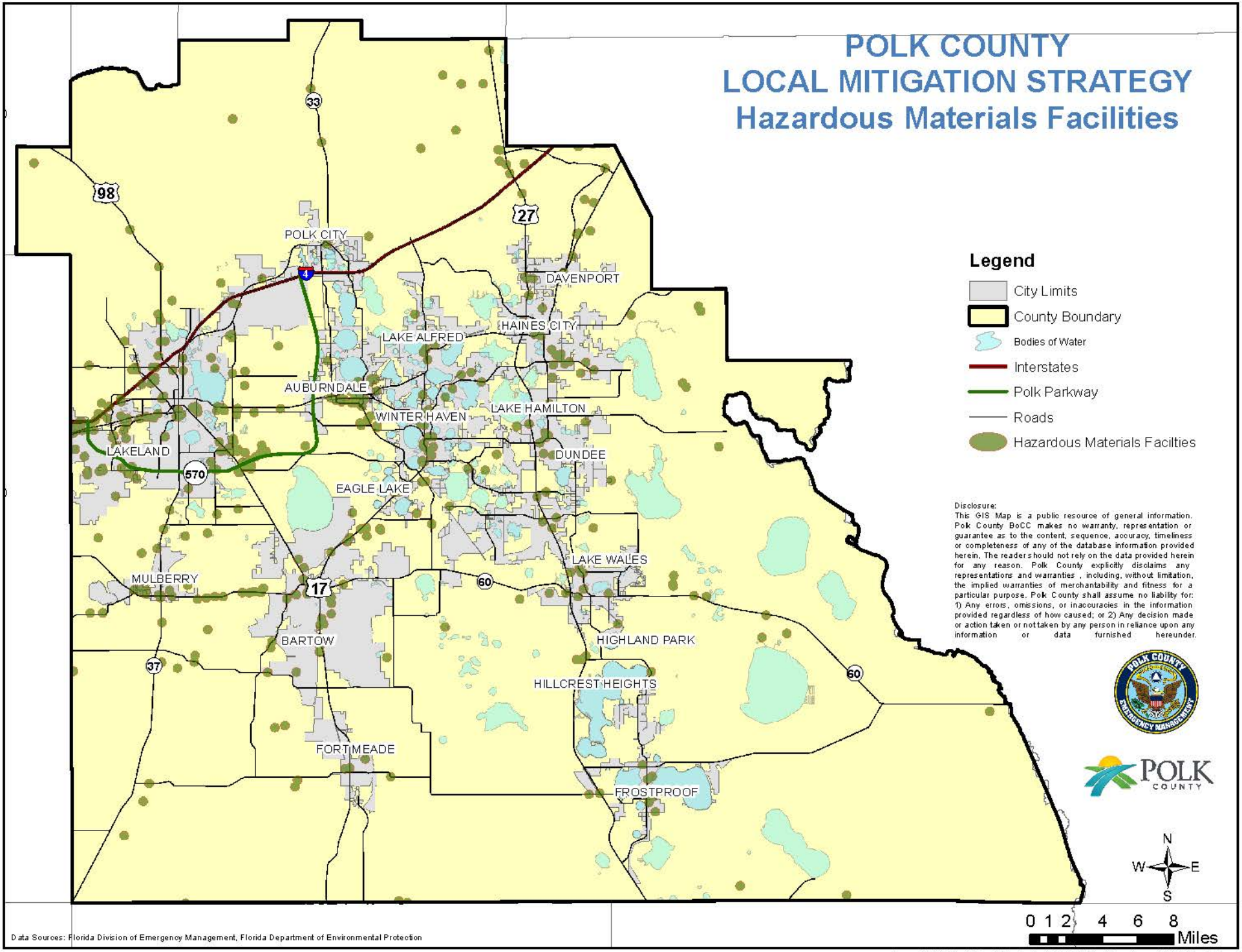
0 1 2 4 6 8 Miles

Data Sources: Florida Department of Environemtnal Protection

Document Path : D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\Sinkhole_Types_2020.mxd

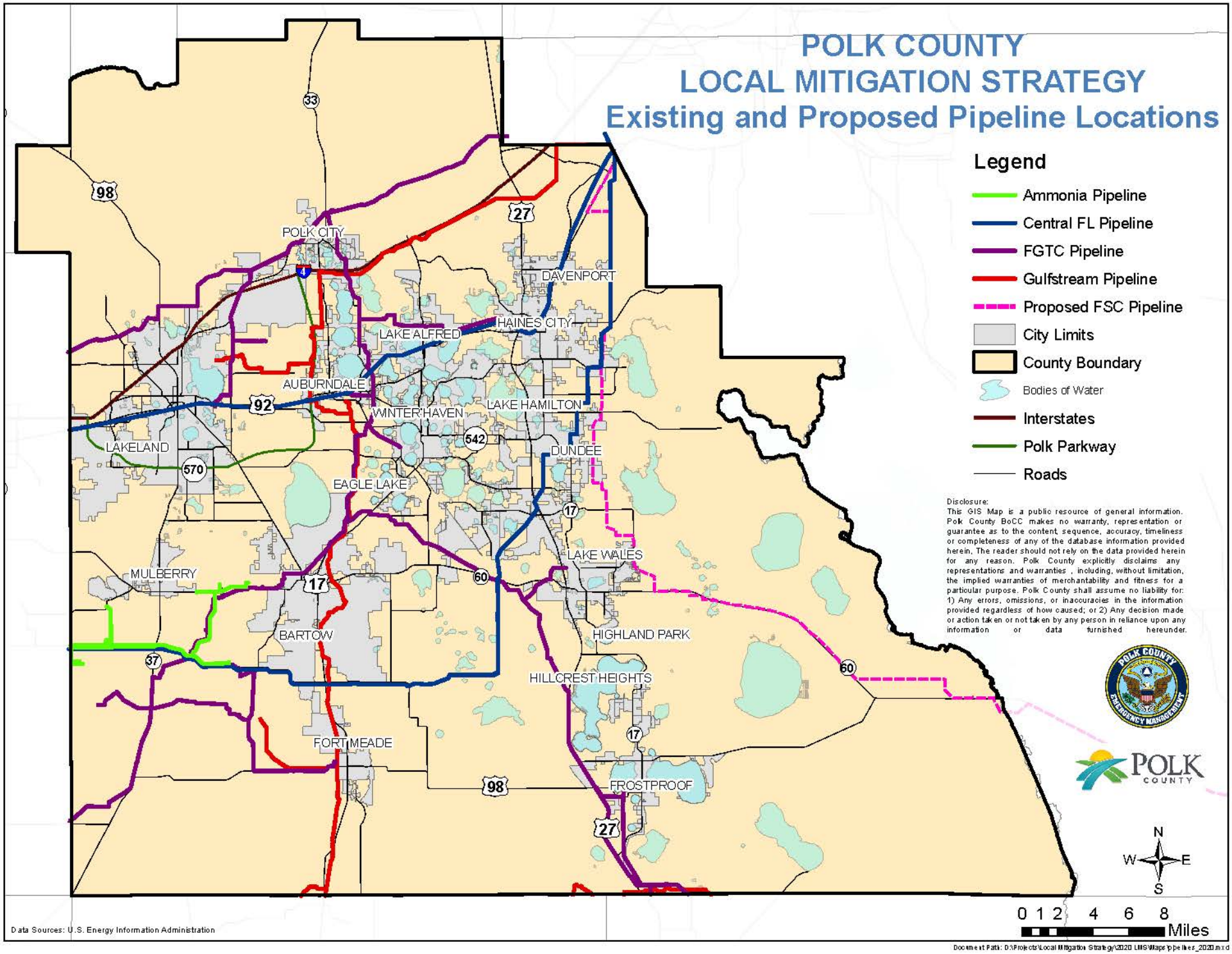
POLK COUNTY
LOCAL MITIGATION STRATEGY
Hazardous Materials Facilities



Data Sources: Florida Division of Emergency Management, Florida Department of Environmental Protection

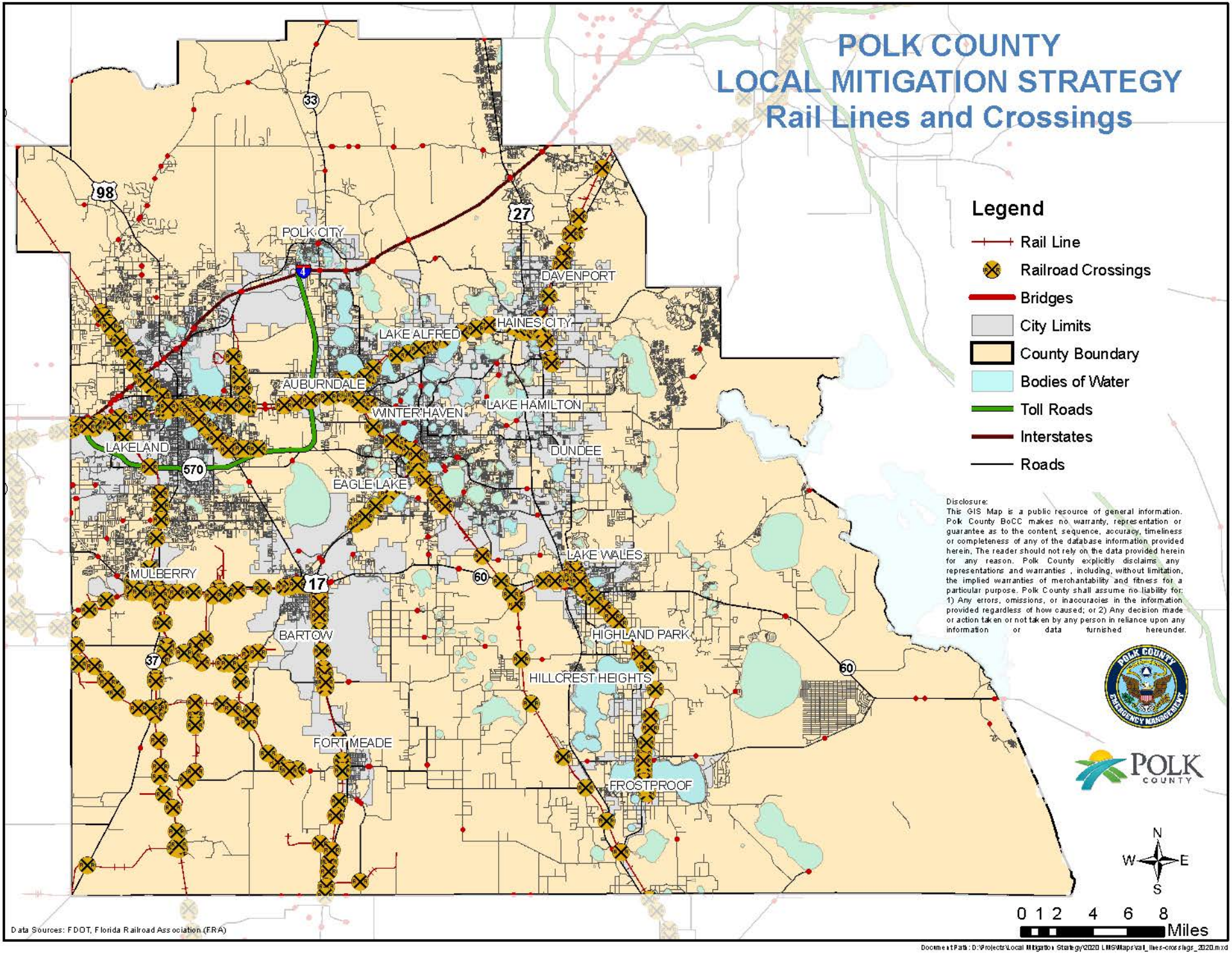
Document Path: D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\hazardous_materials_facilities_2020.mxd

POLK COUNTY
LOCAL MITIGATION STRATEGY
Existing and Proposed Pipeline Locations



Data Sources: U.S. Energy Information Administration

Document Path: D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\pipelines_2020.mxd


POLK COUNTY
LOCAL MITIGATION STRATEGY
Rail Lines and Crossings
Legend
Rail Line
Railroad Crossings
Bridges
City Limits
County Boundary
Bodies of Water
Toll Roads
Interstates
Roads
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POLK COUNTY EMERGENCY MANAGEMENT
POLK COUNTY
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Miles
POLK CITY
DAVENPORT
HAINES CITY
LAKE ALFRED
AUBURNDALE
WINTER HAVEN
LAKE HAMILTON
LAKELAND
DUNDEE
EAGLE LAKE
LAKE WALES
MULBERRY
BARTOW
HIGHLAND PARK
HILLCREST HEIGHTS
FORT MEADE
FROSTPROOF
33
98
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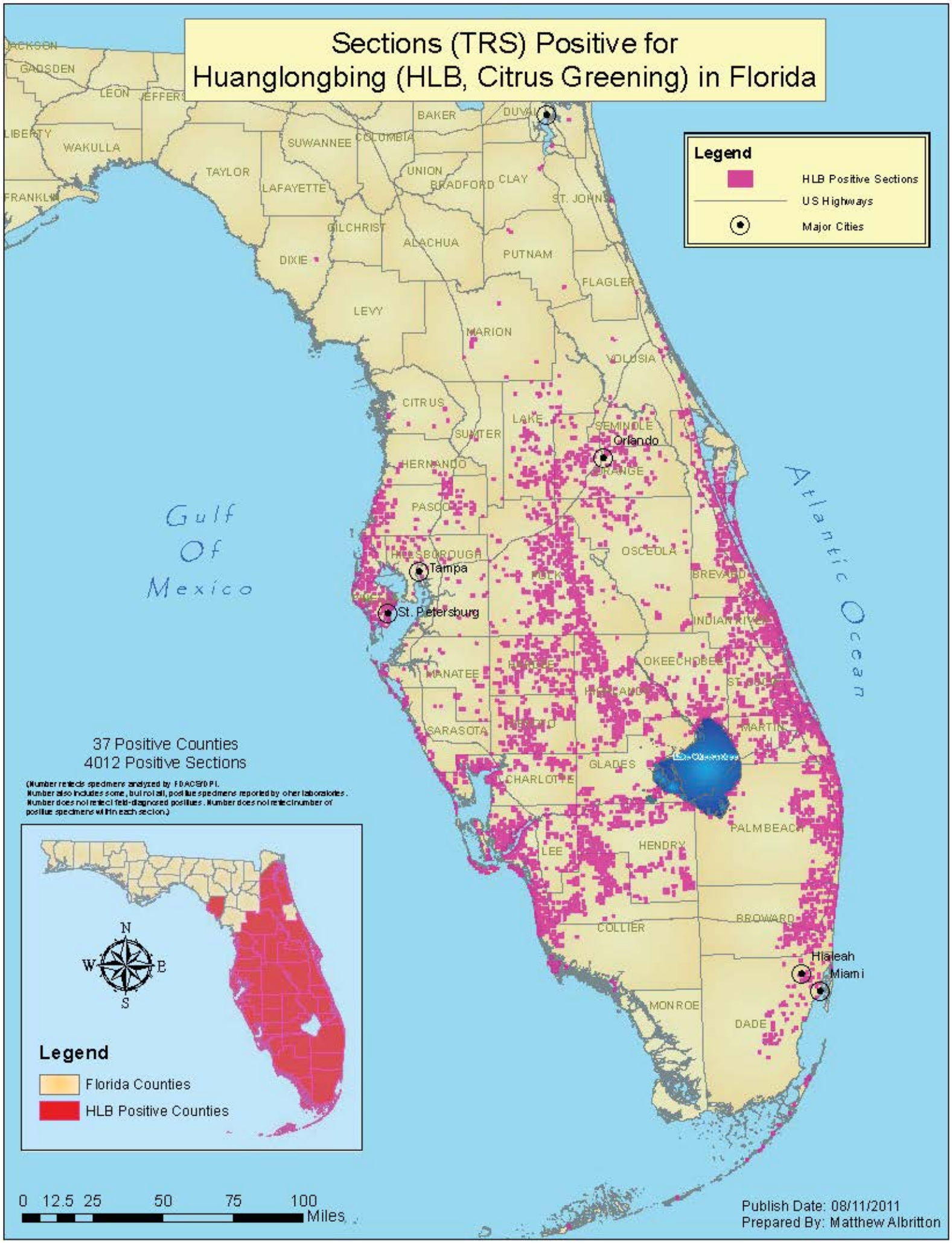
Data Sources: FDOT, Florida Railroad Association (FRA)
Document Path: D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\rail_lines-crossings_2020.mxd

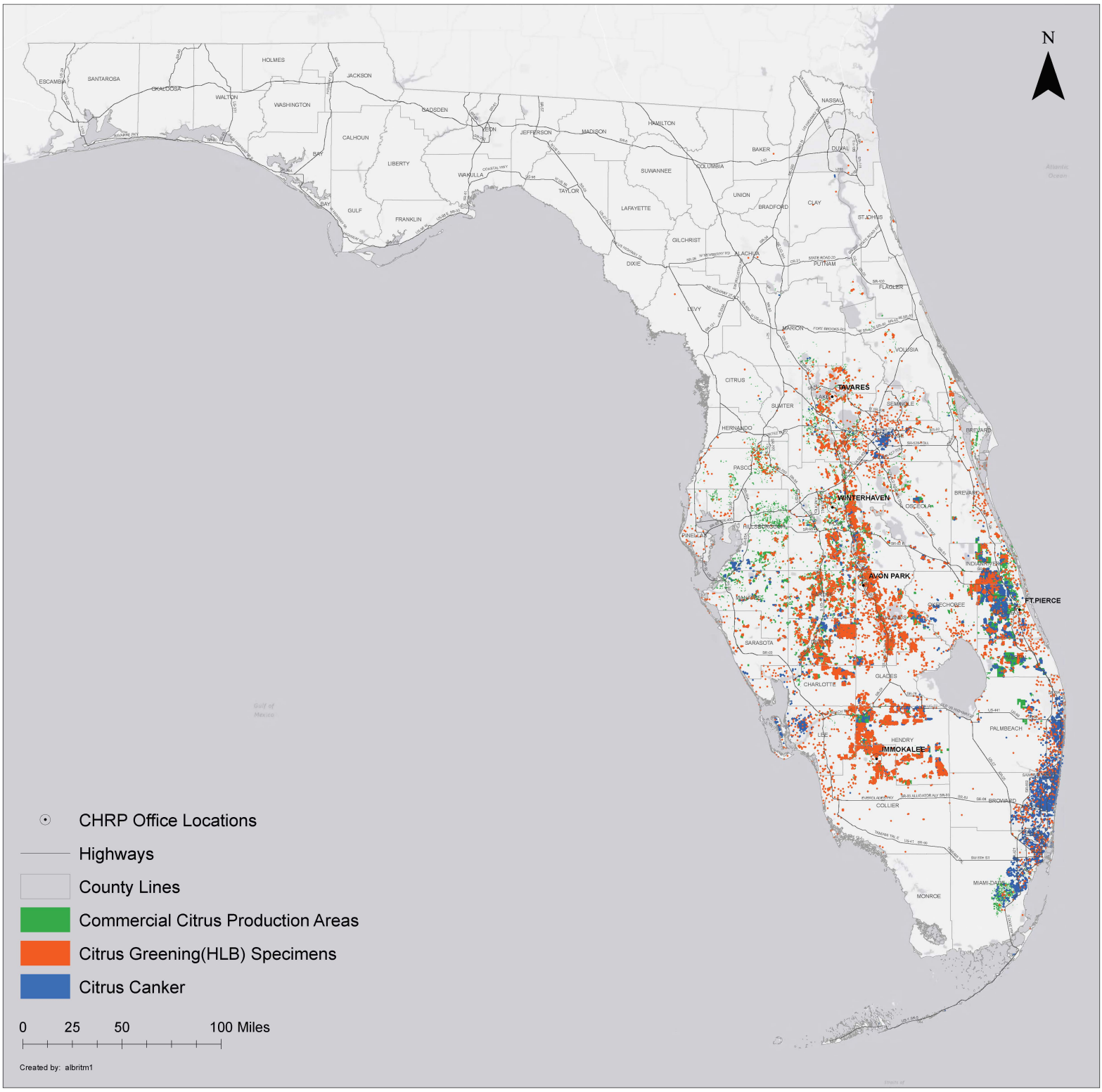
Sections (TRS) Positive for Huanglongbing (HLB, Citrus Greening) in Florida



Known Distribution of Citrus Canker and Citrus Greening (HLB) in Florida

Date: 1/10/2017

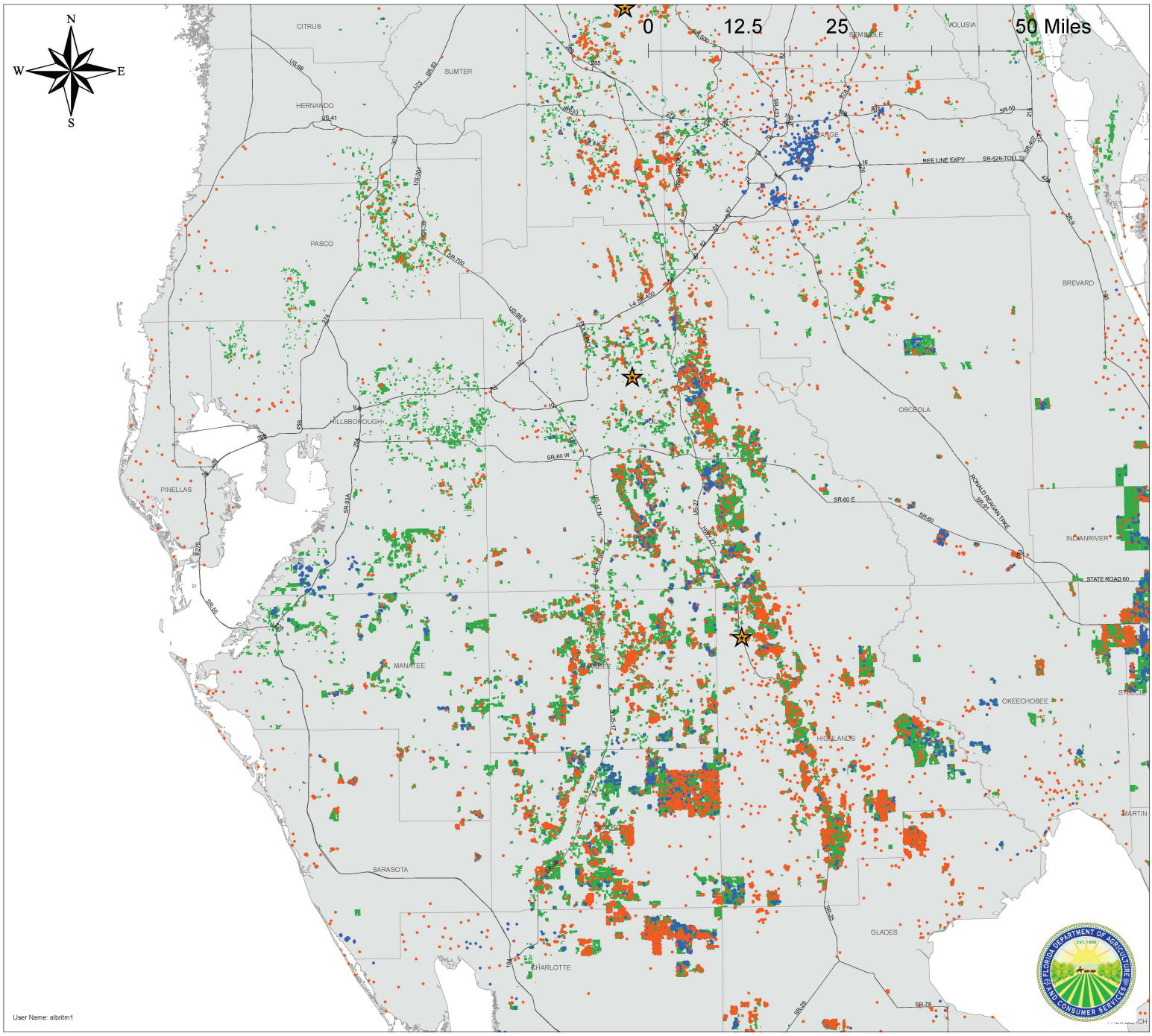
Data being depicted on this website is for reference use only. This data is refreshed on a weekly basis. The Department is not enforcing the destruction of infected material, therefore there is no sure way to determine which infections have been removed and which have not. As such, the data depicted only represents known confirmed positive locations, and due to changing conditions may or may not represent real world scenarios. Before being posted all reasonable efforts have been made to contact owners to inform them of infections. For further explanations please download the available data definitions. If you have additional questions or problems regarding the use of this data, please contact the Help Line 1-800-282-5153.



WINTER HAVEN CHRP AREA

Date: 1/10/2017

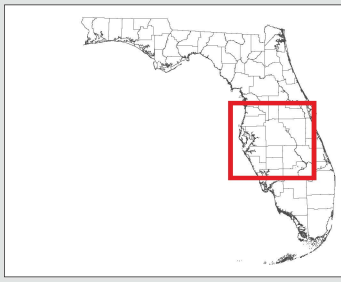
Hillsborough, Pinellas, Polk, Osceola and Manatee counties

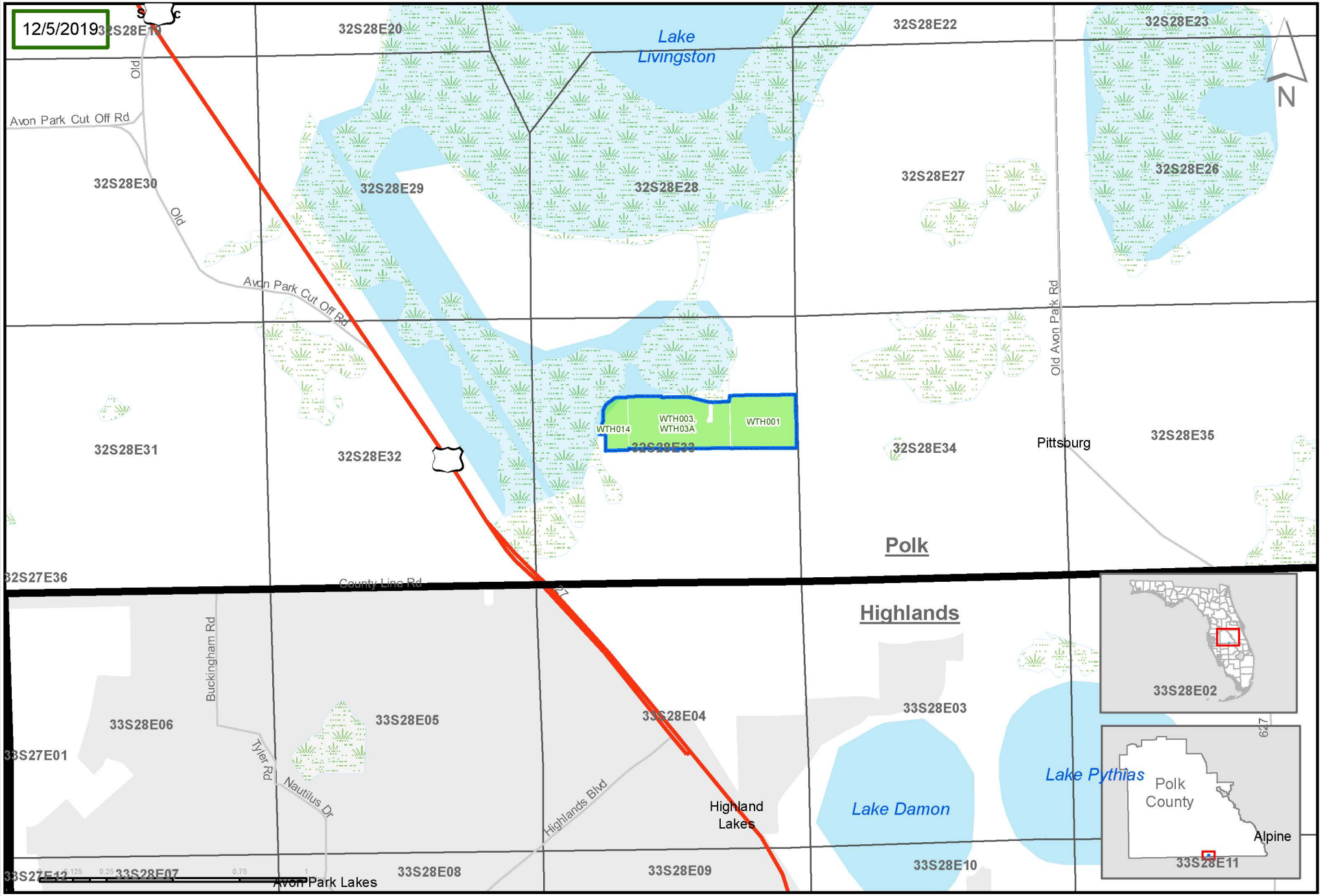


CHRP Office Locations
Highways
County Lines
Commercial Citrus Production Areas
Citrus Greening(HLB) Specimens
Citrus Canker

WINTER HAVEN CHRP OFFICE

3027 Lake Alfred Road
Winter Haven, FL 33881-1438
PHONE: 863-298-3000
FAX: 863-291-3001



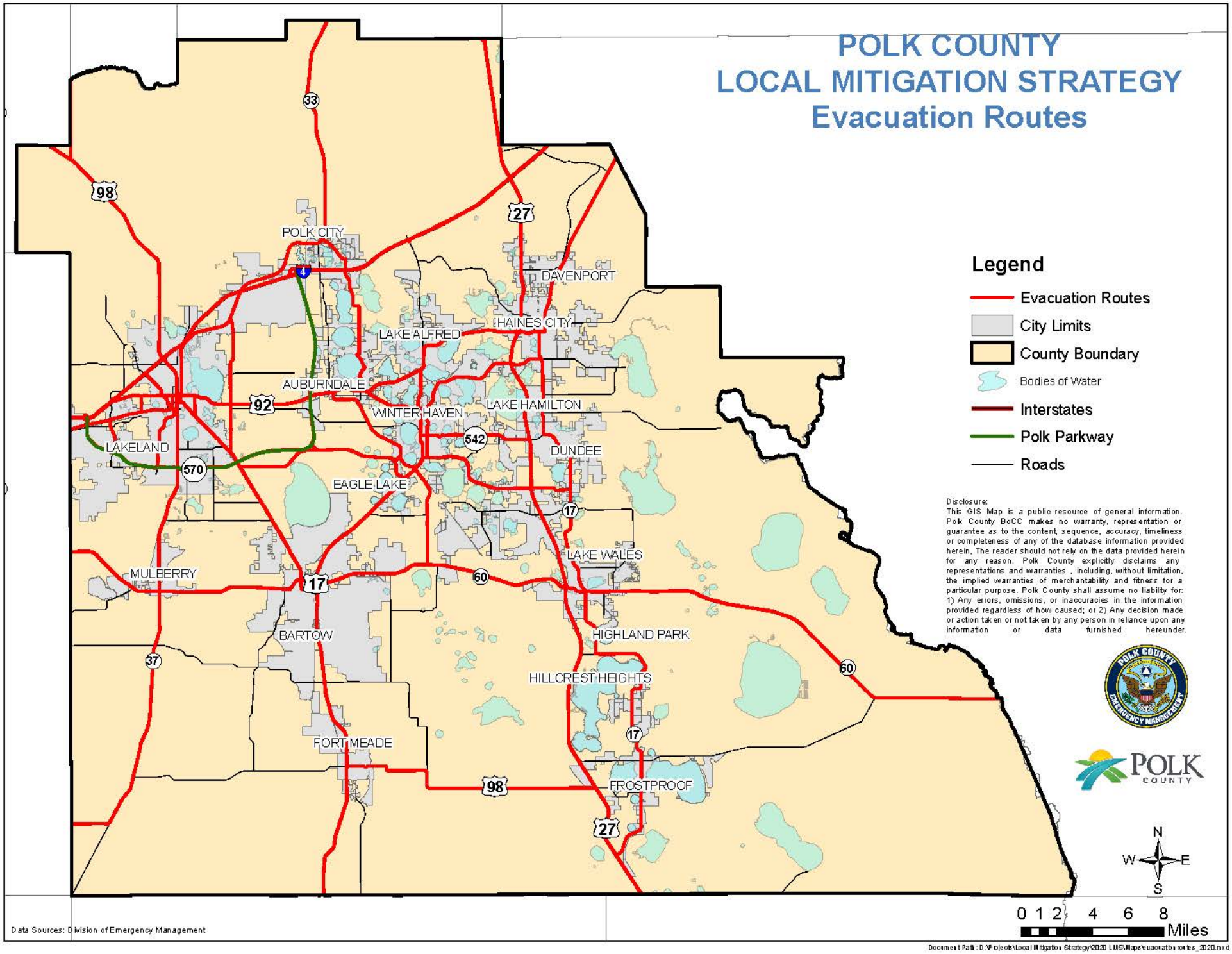


Polk County Citrus Black Spot

Quarantine Zone Map

Prepared By: albritm1

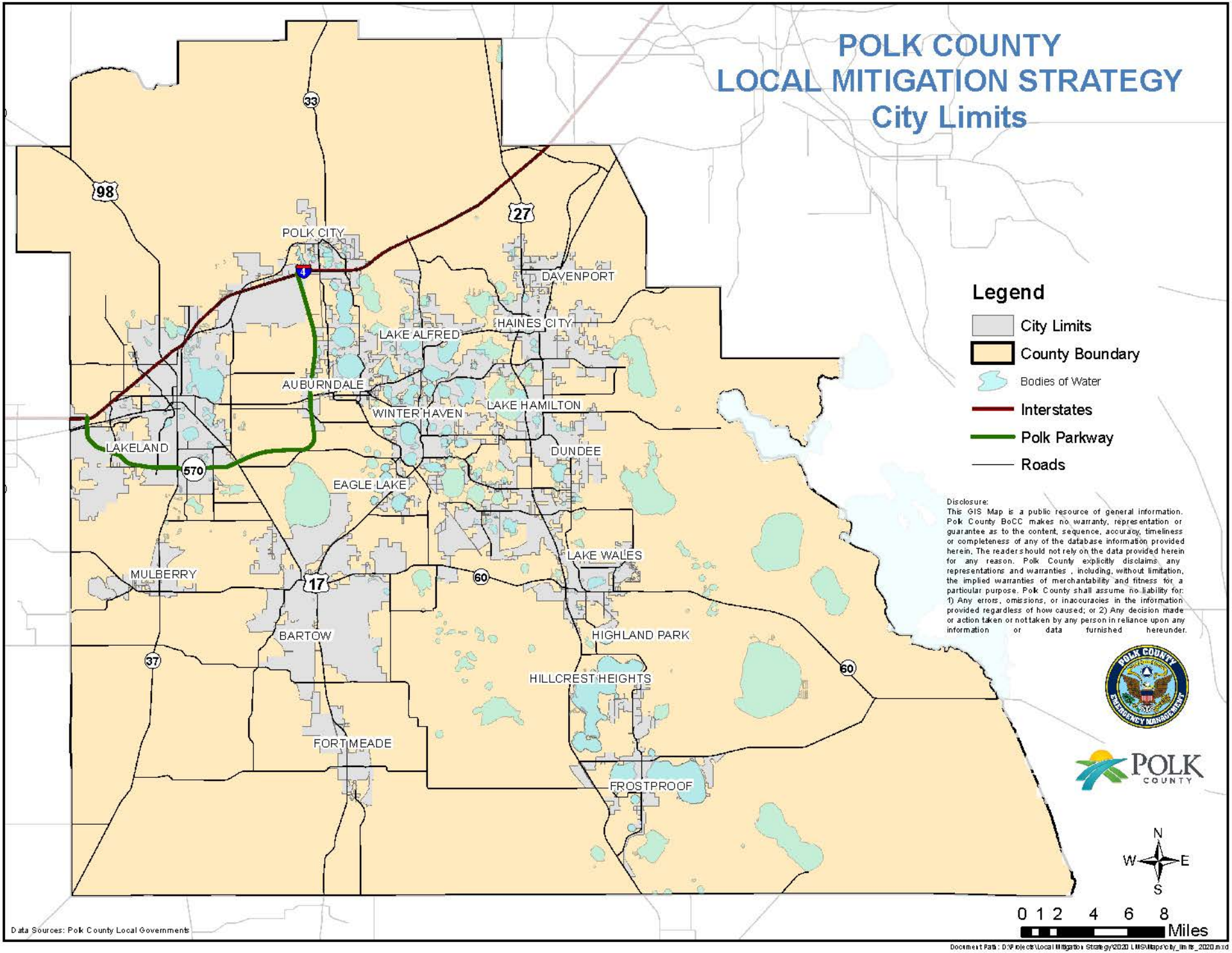
POLK COUNTY
LOCAL MITIGATION STRATEGY
Evacuation Routes



Data Sources: Division of Emergency Management

Document Path : D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\evacuationroutes_2020.mxd

POLK COUNTY
LOCAL MITIGATION STRATEGY
City Limits



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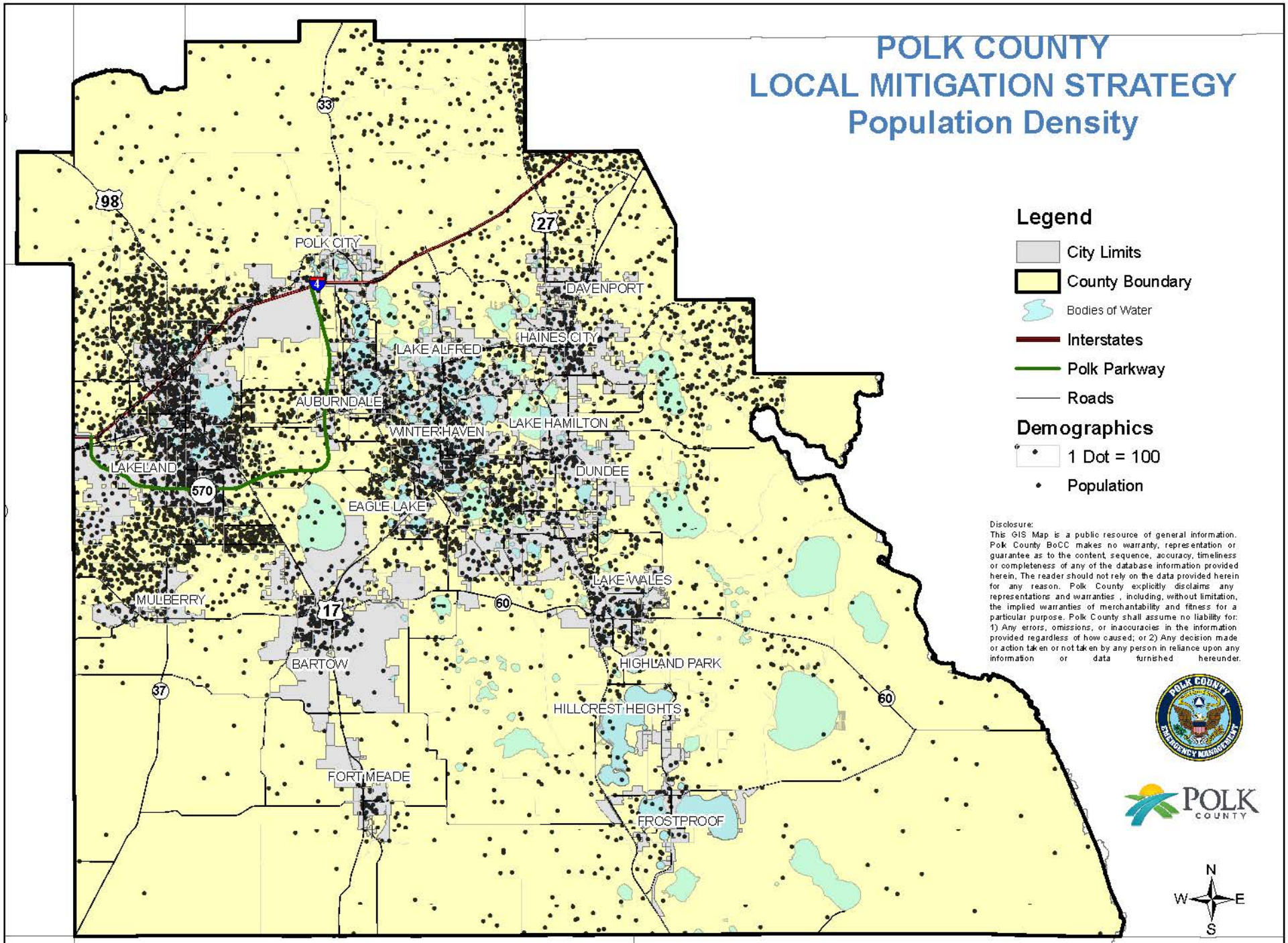
Data Sources: Polk County Local Governments

Document Path : D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\city_limits_2020.mxd

POLK COUNTY
LOCAL MITIGATION STRATEGY
Population Density



Legend

- City Limits
- County Boundary
- Bodies of Water
- Interstates
- Polk Parkway
- Roads

Demographics

- 1 Dot = 100
- Population

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POLK COUNTY EMERGENCY MANAGEMENT

POLK COUNTY

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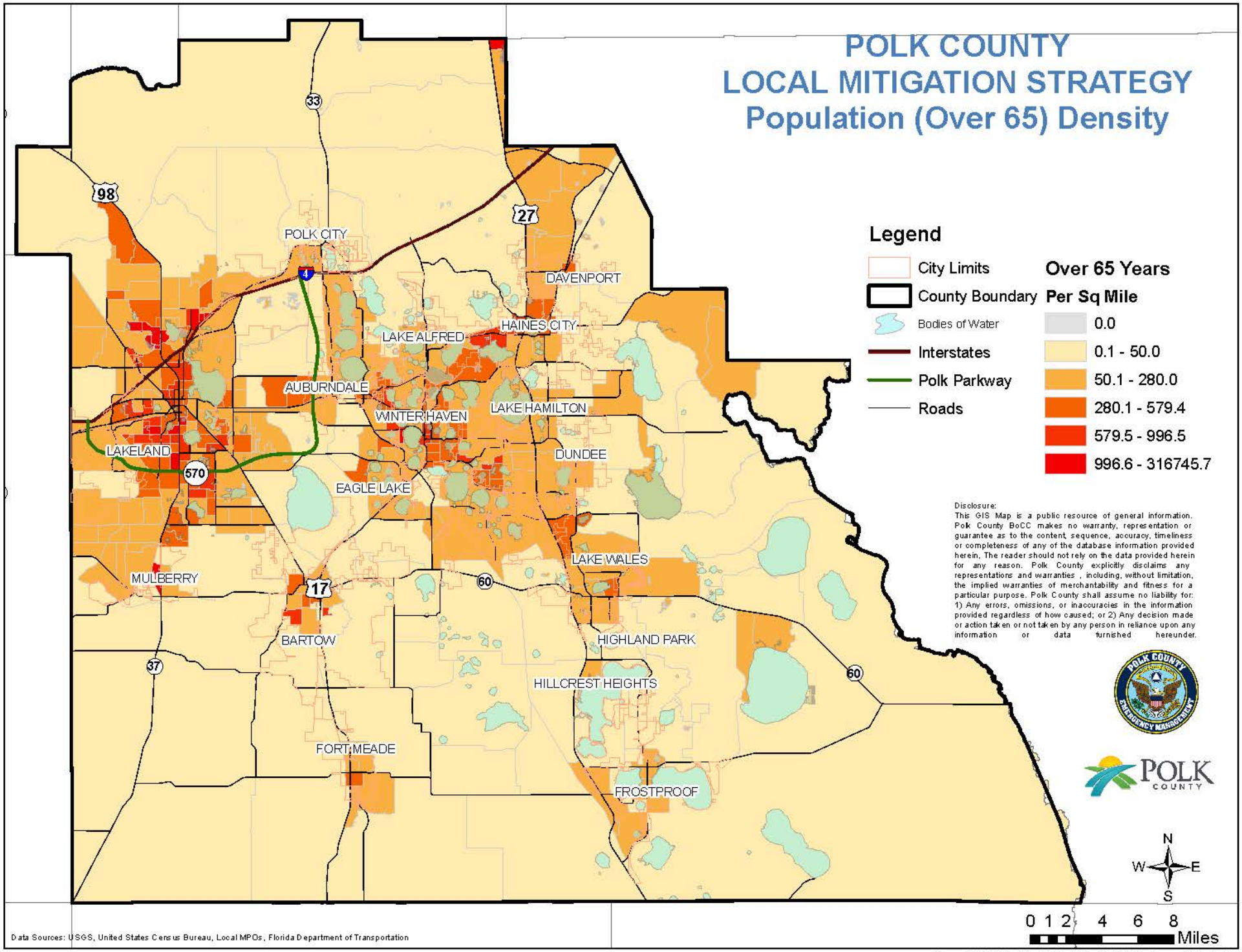
0 1 2 4 6 8
Miles

Data Sources: USGS, United States Census Bureau, Local MPOs, Florida Department of Transportation

Document Path : D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\demographic_Pop_Density_2020.mxd

POLK COUNTY
LOCAL MITIGATION STRATEGY
Population (Over 65) Density



Legend

	Over 65 Years Per Sq Mile
City Limits	
County Boundary	
Bodies of Water	0.0
Interstates	0.1 - 50.0
Polk Parkway	50.1 - 280.0
Roads	280.1 - 579.4
	579.5 - 996.5
	996.6 - 316745.7

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N
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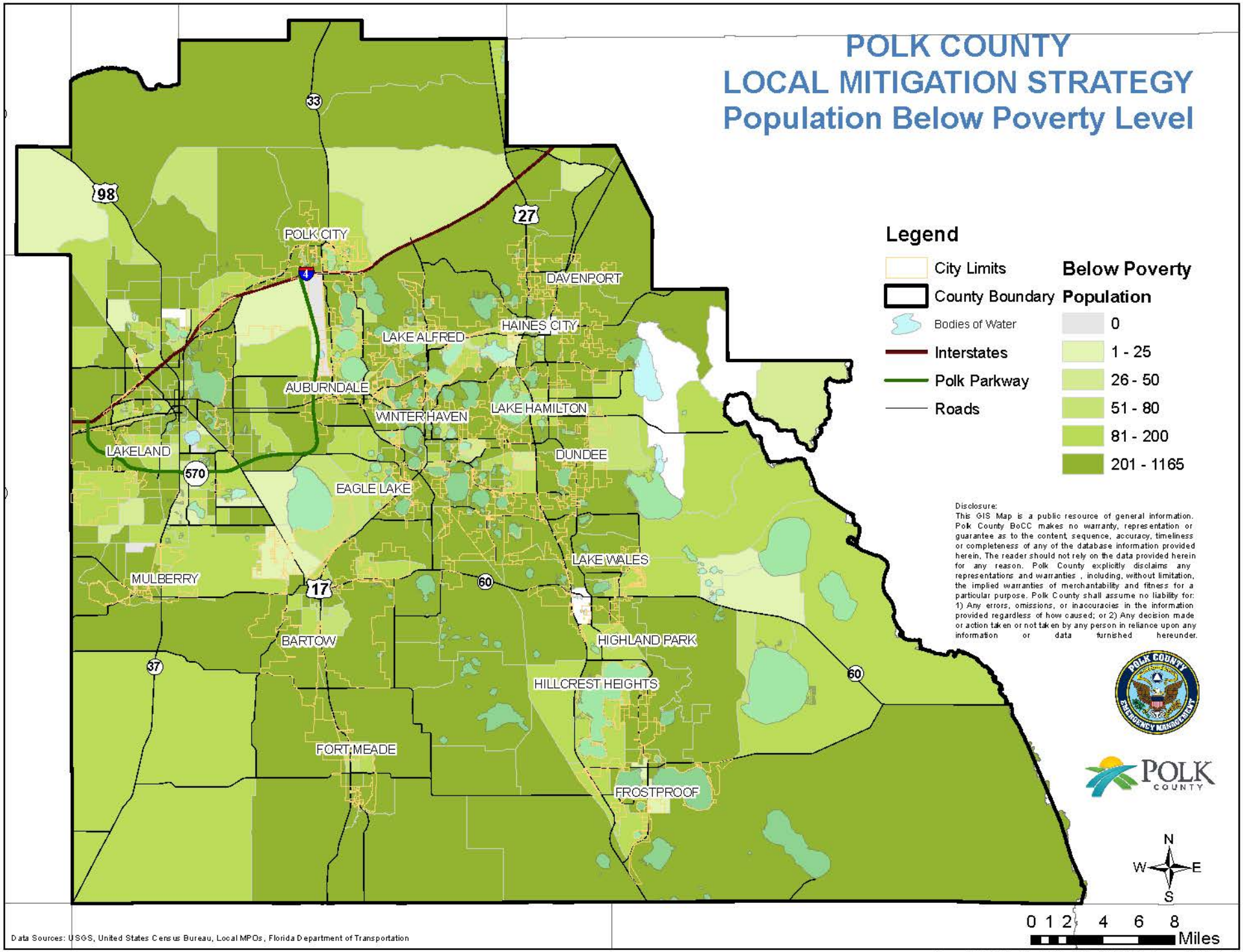
0 1 2 4 6 8
Miles

Data Sources: USGS, United States Census Bureau, Local MPOs, Florida Department of Transportation

Document Path : D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\demographic_PopOver65_Density_2020.mxd

POLK COUNTY
LOCAL MITIGATION STRATEGY
Population Below Poverty Level



Legend

City Limits	**Below Poverty Population**
County Boundary	
Bodies of Water	0
Interstates	1 - 25
Polk Parkway	26 - 50
Roads	51 - 80
	81 - 200
	201 - 1165

N
W E
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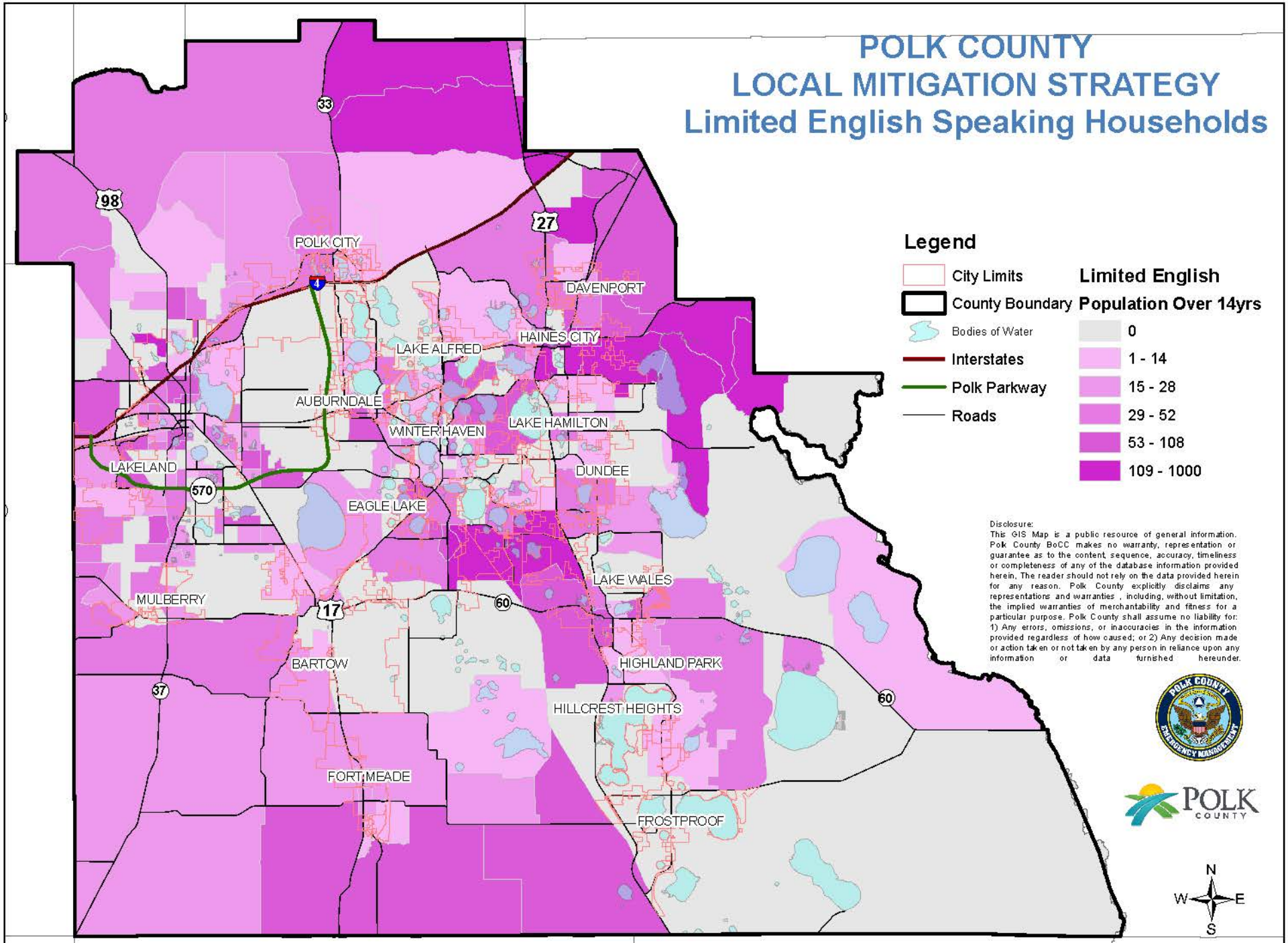
0 1 2 4 6 8 Miles

Data Sources: USGS, United States Census Bureau, Local MPOs, Florida Department of Transportation

Document Path: D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\demographic_BelowPoverty_2020.mxd

POLK COUNTY
LOCAL MITIGATION STRATEGY
Limited English Speaking Households



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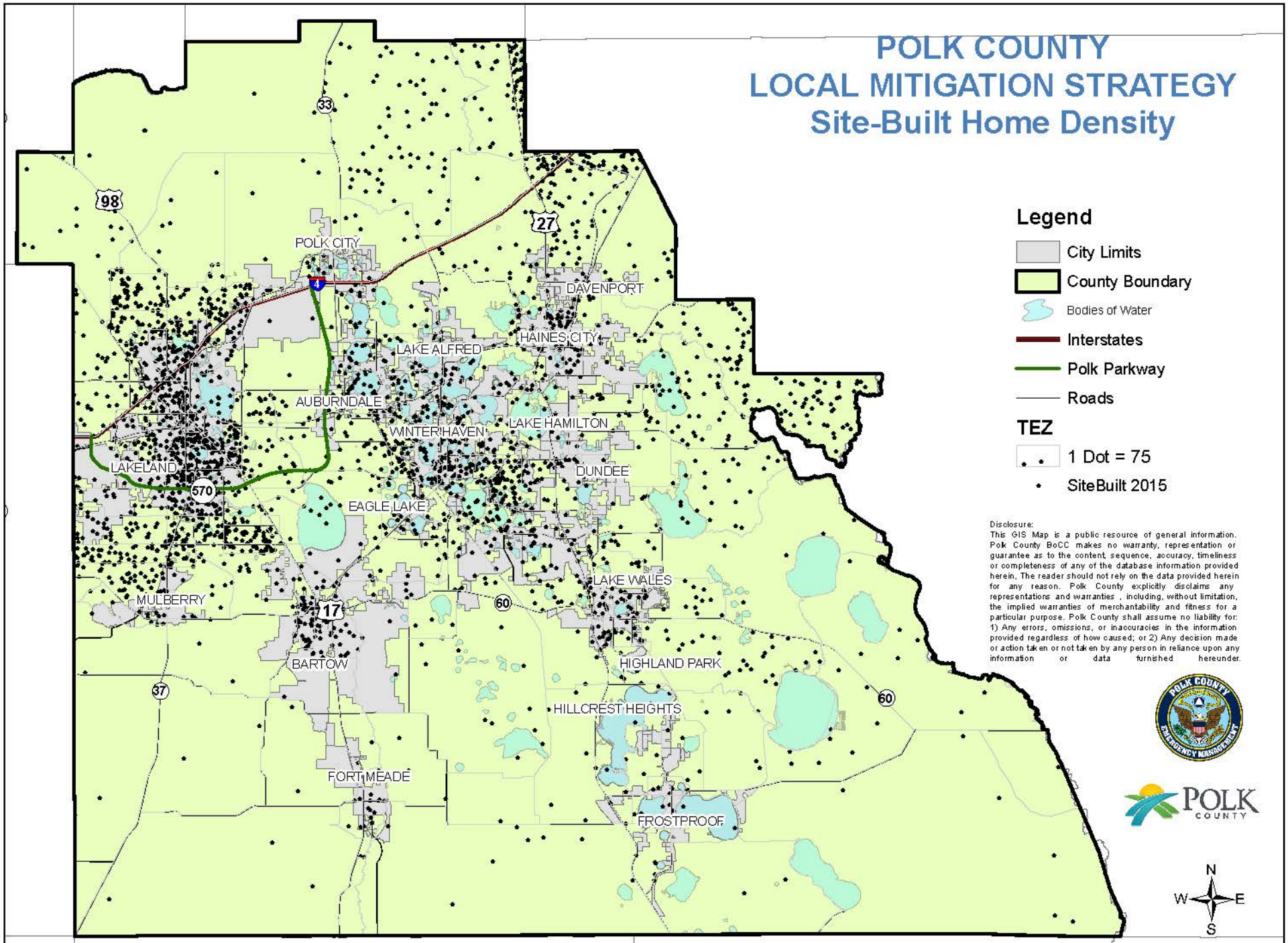
Data Sources: USGS, United States Census Bureau, Local MPOs, Florida Department of Transportation

Document Path : D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\demographic_LimitedEnglish_2020.mxd

POLK COUNTY
LOCAL MITIGATION STRATEGY
Site-Built Home Density



Legend

- City Limits
- County Boundary
- Bodies of Water
- Interstates
- Polk Parkway
- Roads

TEZ

- 1 Dot = 75
- SiteBuilt 2015

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POLK COUNTY EMERGENCY MANAGEMENT

POLK COUNTY

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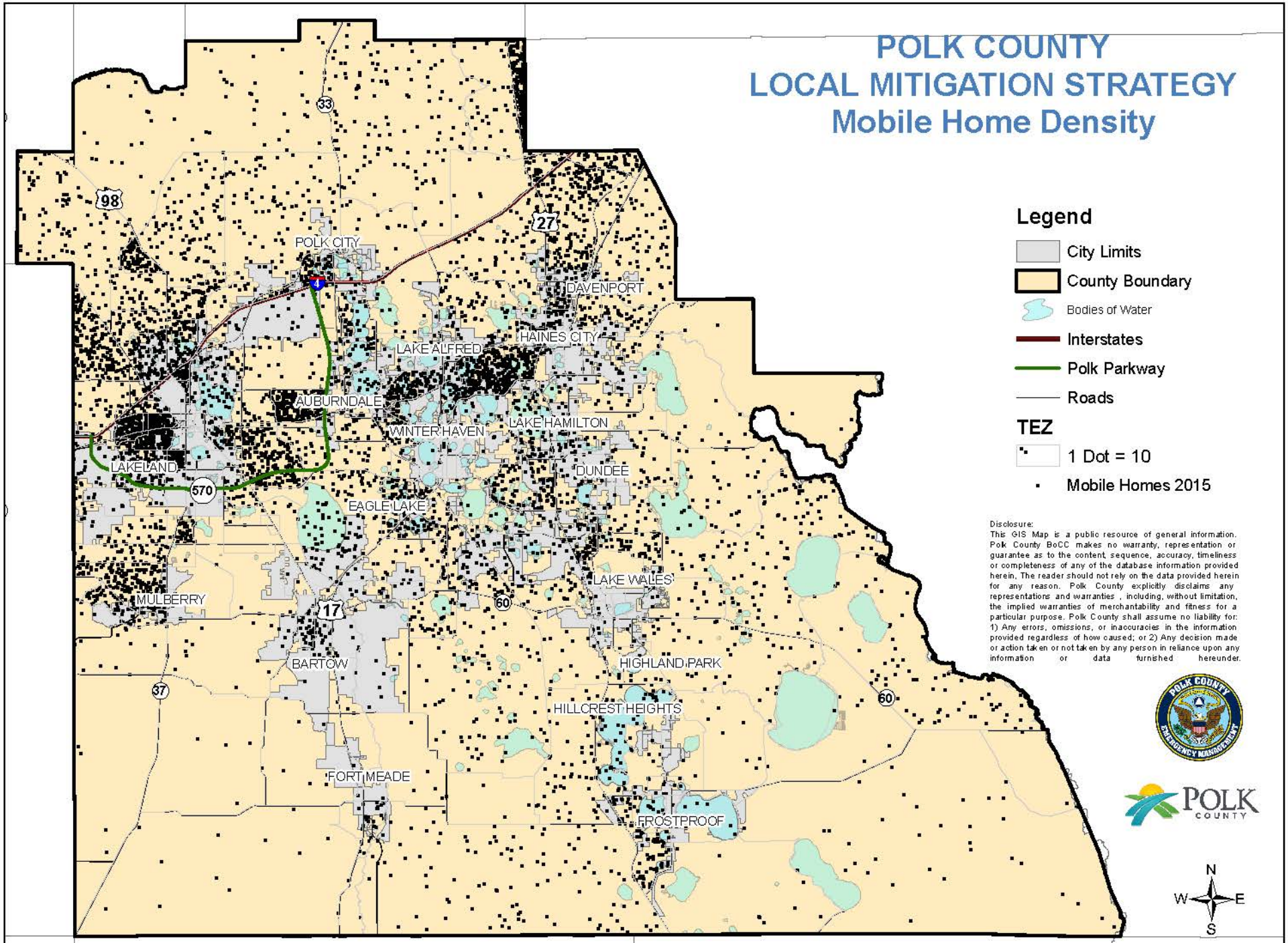
Miles

Data Sources: USGS, United States Census Bureau, Local MPOs, Florida Department of Transportation

Document Path: D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\demographic_SiteBuiltHome_Density_2020.mxd

POLK COUNTY
LOCAL MITIGATION STRATEGY
Mobile Home Density



Legend

- City Limits
- County Boundary
- Bodies of Water
- Interstates
- Polk Parkway
- Roads

TEZ

- 1 Dot = 10
- Mobile Homes 2015

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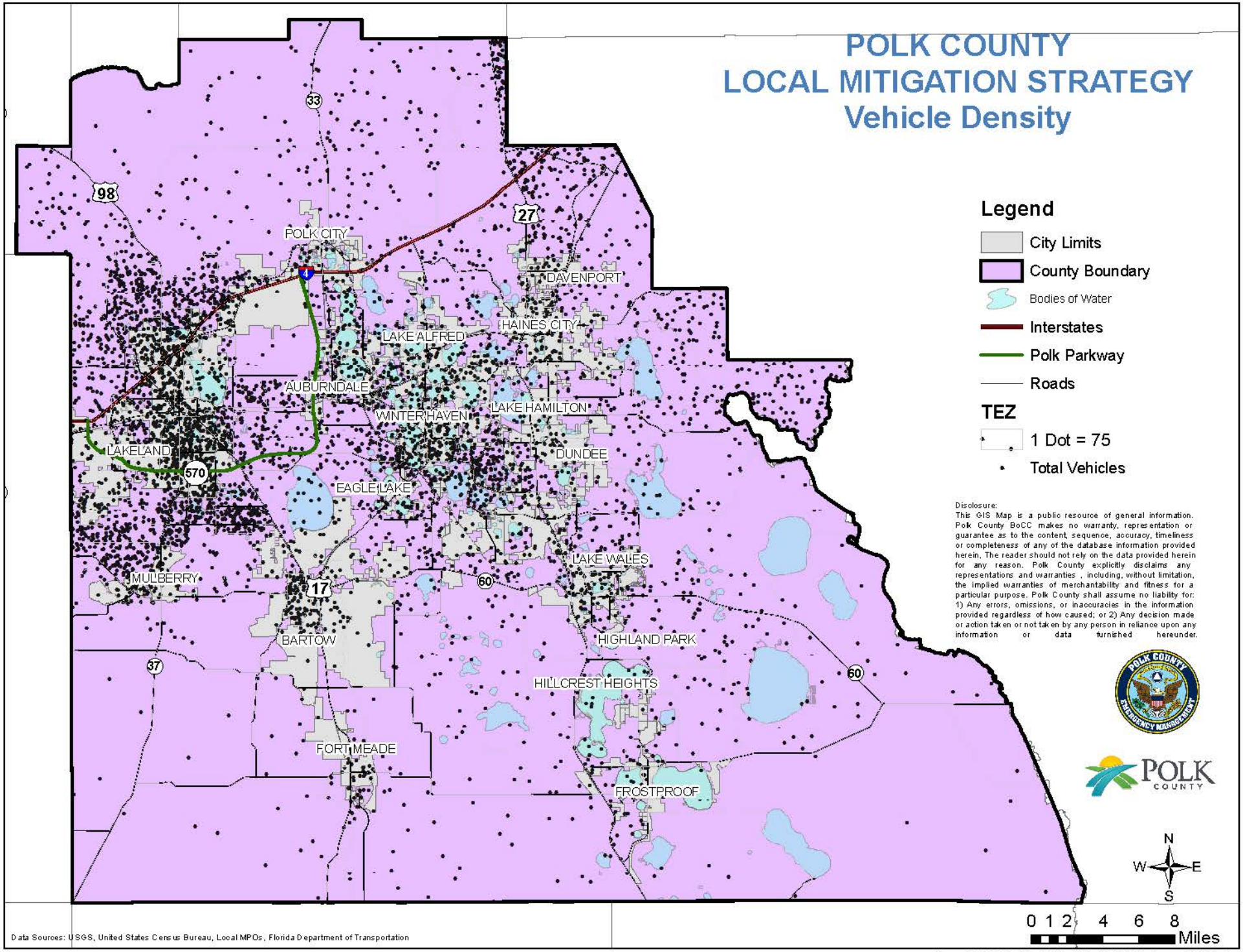
Data Sources: USGS, United States Census Bureau, Local MPOs, Florida Department of Transportation

Document Path : D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\demographic_Mobile Home_Density_2020.mxd

POLK COUNTY
LOCAL MITIGATION STRATEGY
Vehicle Density



Legend

- City Limits
- County Boundary
- Bodies of Water
- Interstates
- Polk Parkway
- Roads

TEZ

- 1 Dot = 75
- Total Vehicles

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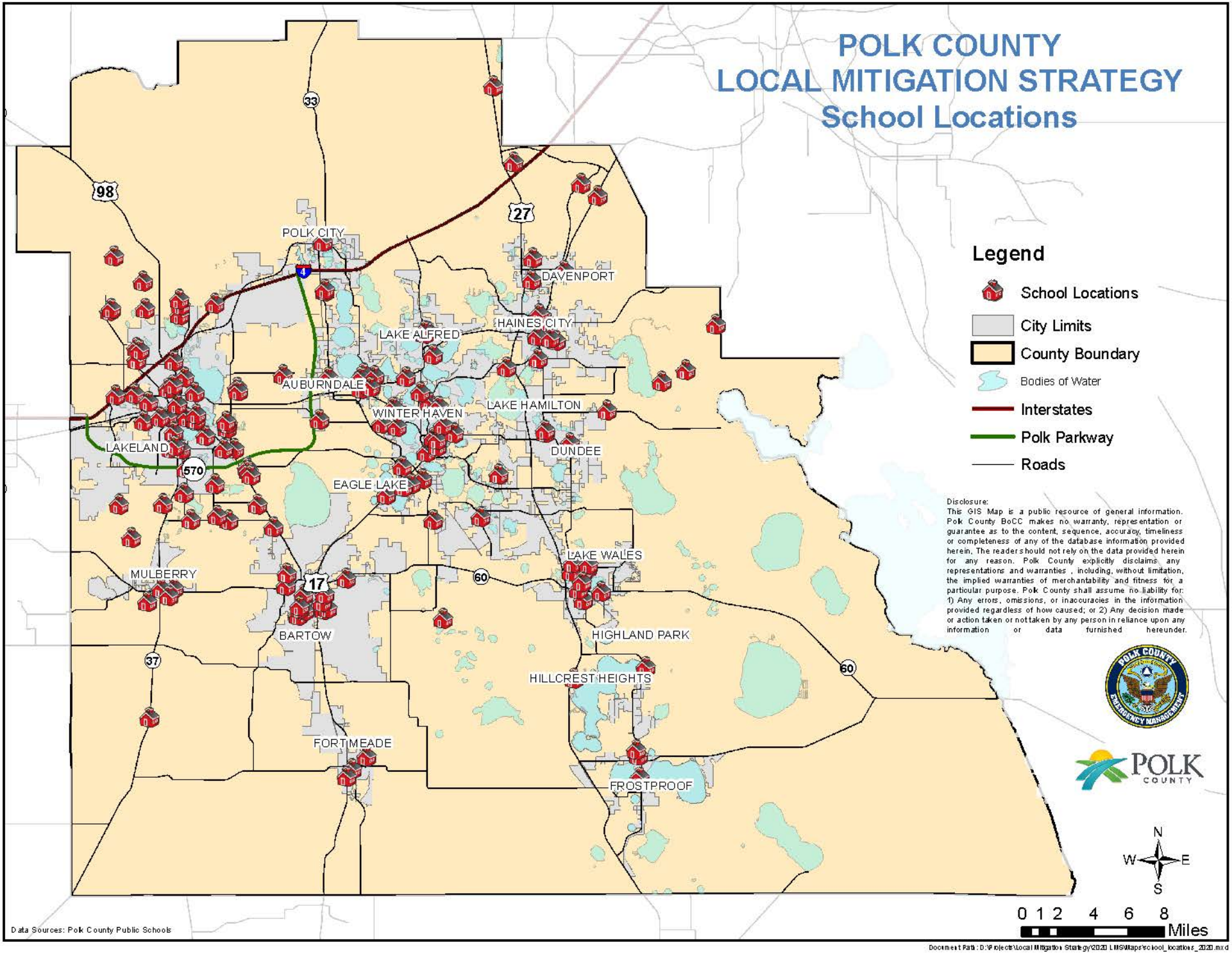
Miles

Data Sources: USGS, United States Census Bureau, Local MPOs, Florida Department of Transportation

Document Path : D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\demographic_Vehicle_Density_2020.mxd


POLK COUNTY
LOCAL MITIGATION STRATEGY
School Locations
Legend
School Locations
City Limits
County Boundary
Bodies of Water
Interstates
Polk Parkway
Roads
Disclosure:
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POLK COUNTY EMERGENCY MANAGEMENT
POLK COUNTY
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Miles
POLK CITY
DAVENPORT
HAINES CITY
LAKE ALFRED
AUBURNDALE
WINTER HAVEN
LAKE HAMILTON
DUNDEE
LAKELAND
EAGLE LAKE
LAKE WALES
MULBERRY
BARTOW
HIGHLAND PARK
HILLCREST HEIGHTS
FORT MEADE
FROSTPROOF
33
98
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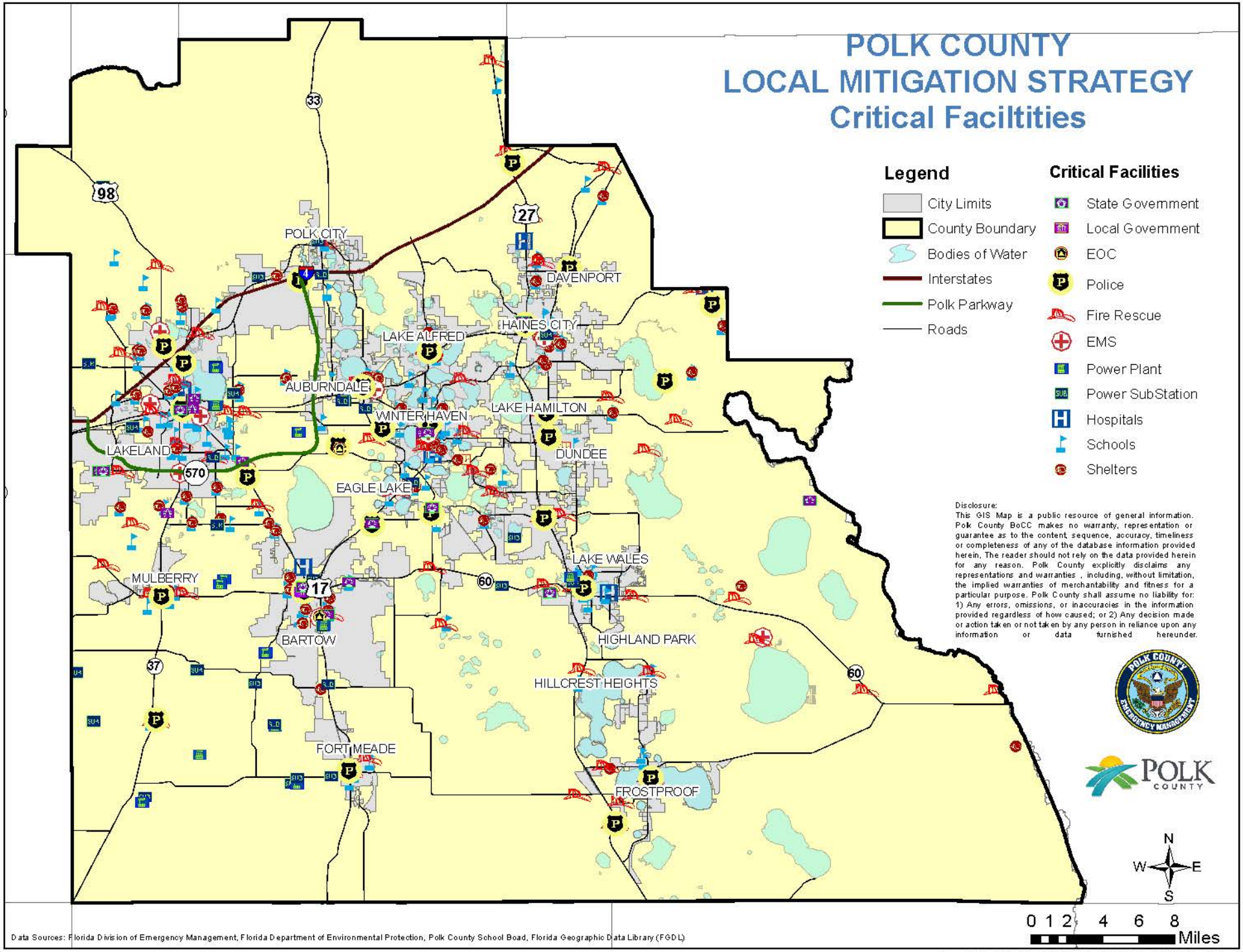
Data Sources: Polk County Public Schools
Document Path : D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\school_locations_2020.mxd

POLK COUNTY
LOCAL MITIGATION STRATEGY
Critical Faciltities



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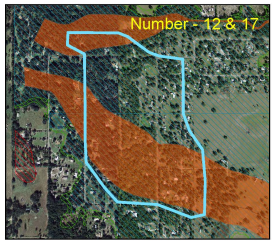
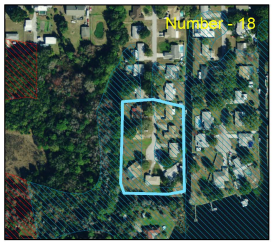
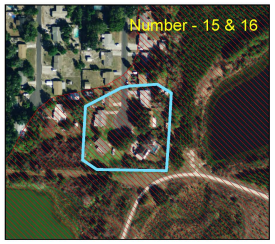
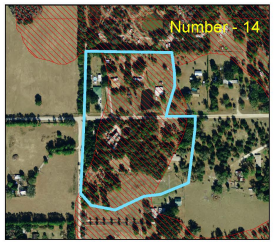
Data Sources: Florida Division of Emergency Management; Florida Department of Environmental Protection, Polk County School Boad, Florida Geographic Data Library (FGDL)

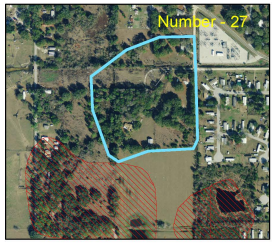
Document Path: D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\critical_facilities_2020.mxd

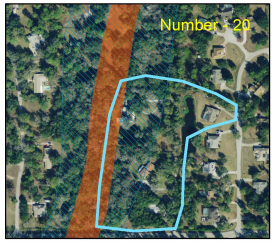


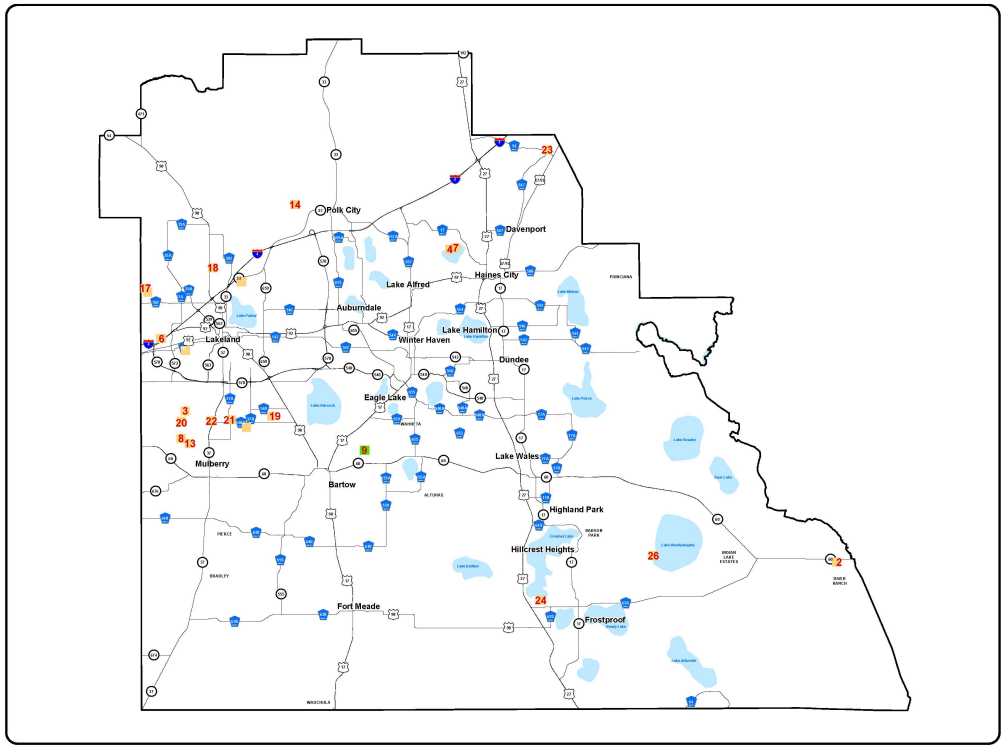


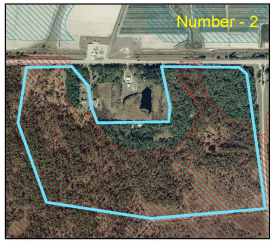


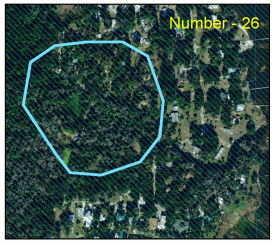


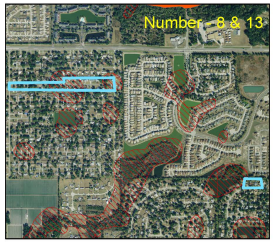


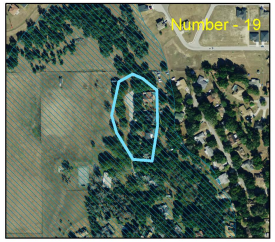


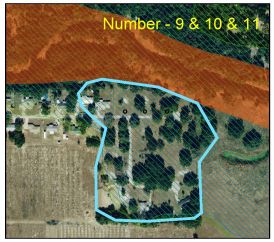












POLK COUNTY CRS MAP SERIES

Repetitive Loss Areas Activity 502

Legend

- FEMA Floodways
- Flood Zone A
- Flood Zone AE
- Flood Zone AH
- Flood Zone X5
- Major Waterbodies
- Major Roads
- Repetative Loss - Notify
- Repetitive Loss Sites
- County Purchased
- Reptetive Loss Area
- Municipalities
- County Boundary

Aerial Source:
2009 Sothwest Florida Water Management District

Repetitve Loss Areas based on topography.

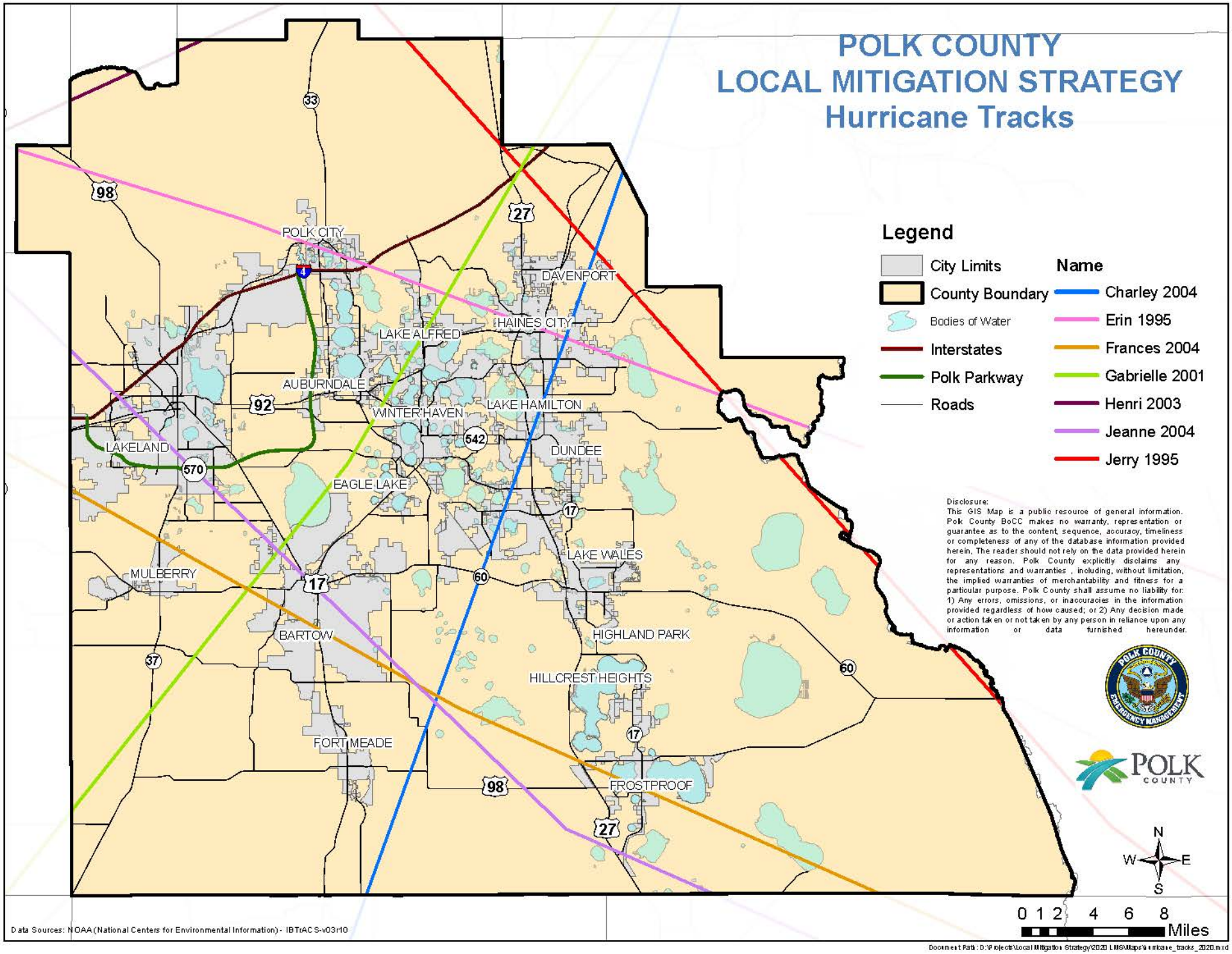
If you have any comments or questions regarding the map, please contact Randall Vogel at 863-534-6767 or randalvogel@polk-county.net

Prepared by:
Polk County
Board of County Commissioners
Growth Management Department
April 2010

N

0 2.5 5 10 15 20
Miles

POLK COUNTY
LOCAL MITIGATION STRATEGY
Hurricane Tracks



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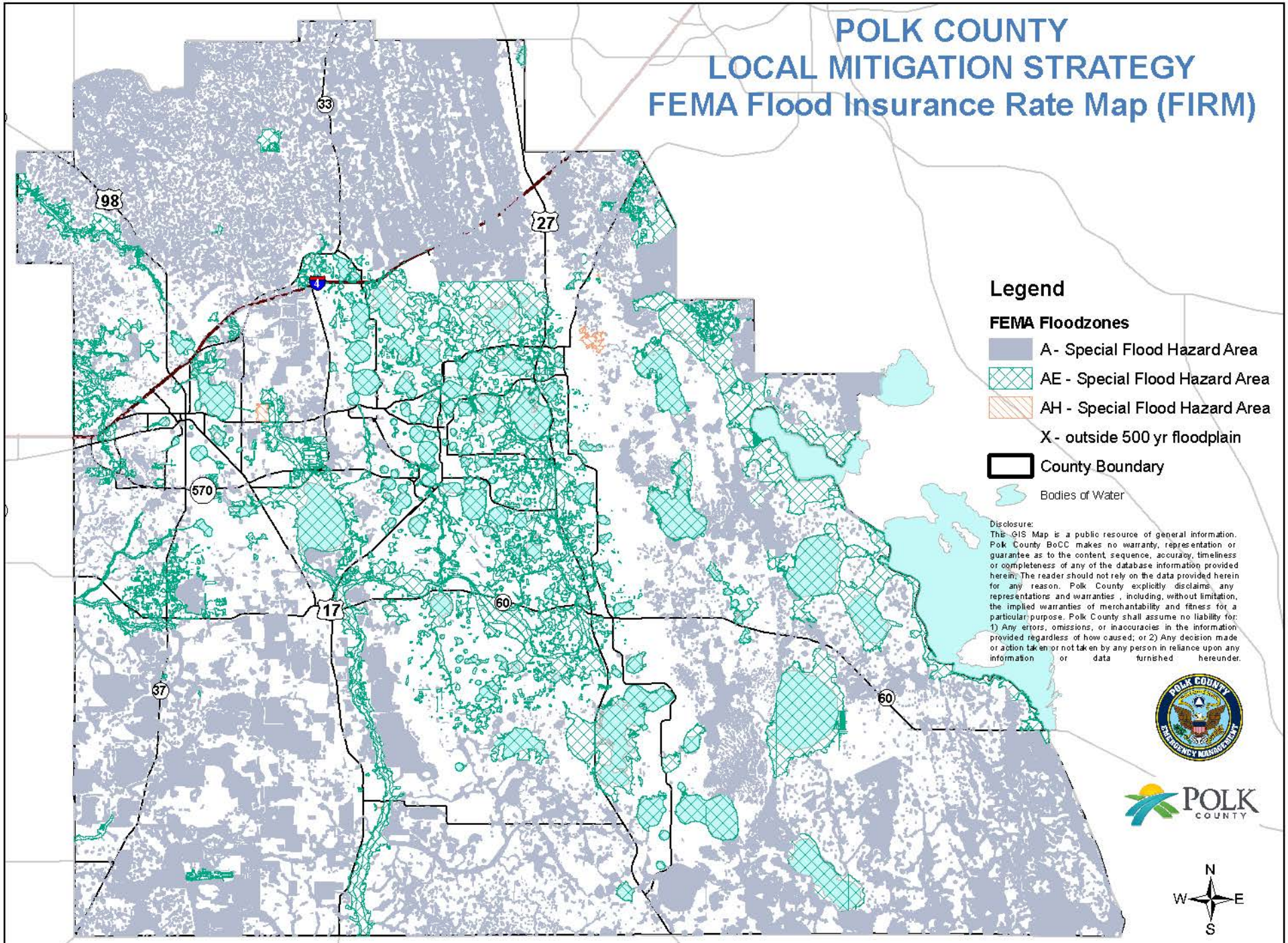
Data Sources: NOAA (National Centers for Environmental Information) - IBTrACS-v03r10

Document Path : D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\Hurricane_tracks_2020.mxd

POLK COUNTY
LOCAL MITIGATION STRATEGY
FEMA Flood Insurance Rate Map (FIRM)



Legend

FEMA Floodzones

- A - Special Flood Hazard Area
- AE - Special Flood Hazard Area
- AH - Special Flood Hazard Area
- X - outside 500 yr floodplain
- County Boundary
- Bodies of Water

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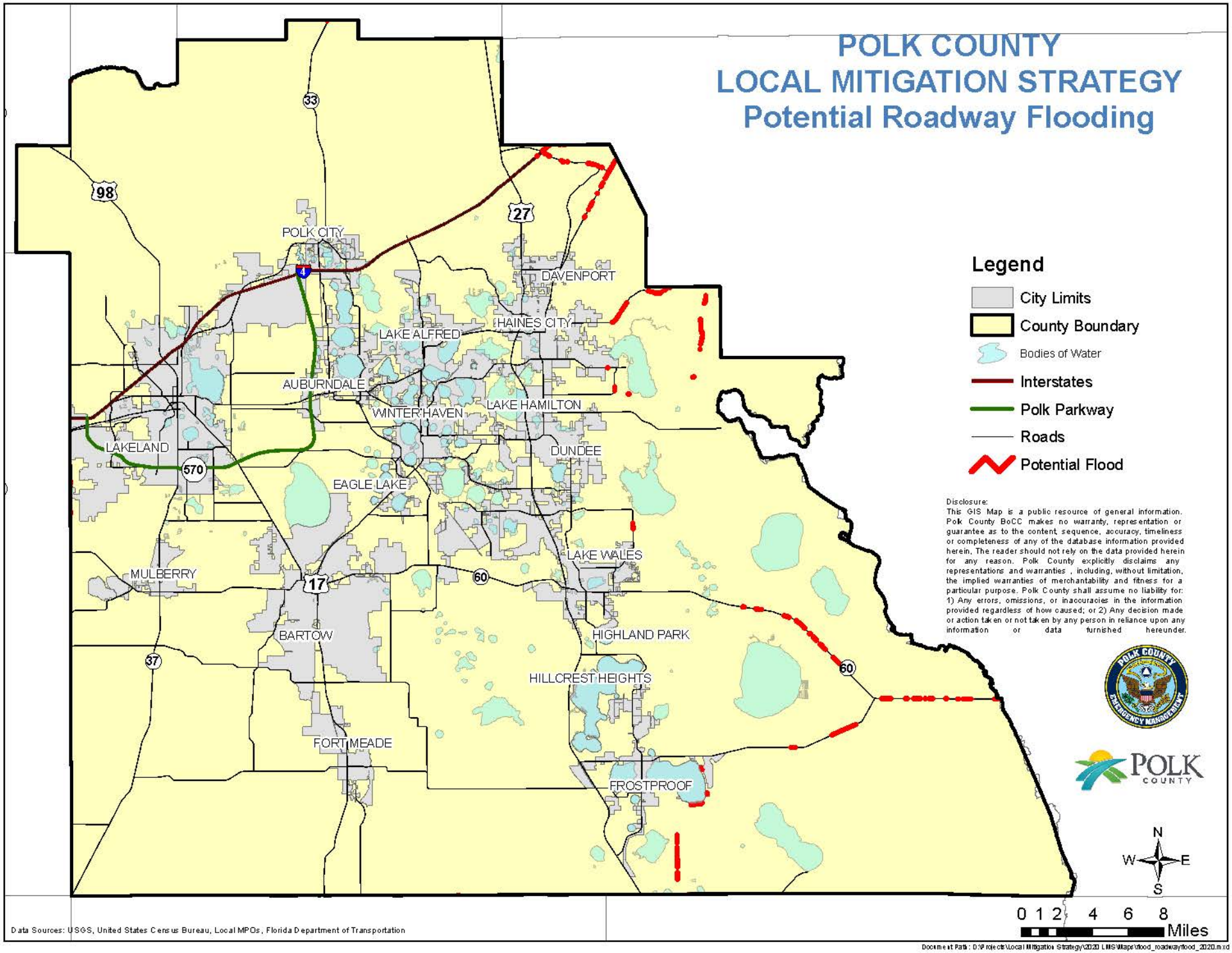
Miles

Data Sources: Federal Emergency Management Agency (FEMA) Flood Insurnace Rate Map (FIRM), updated 2016

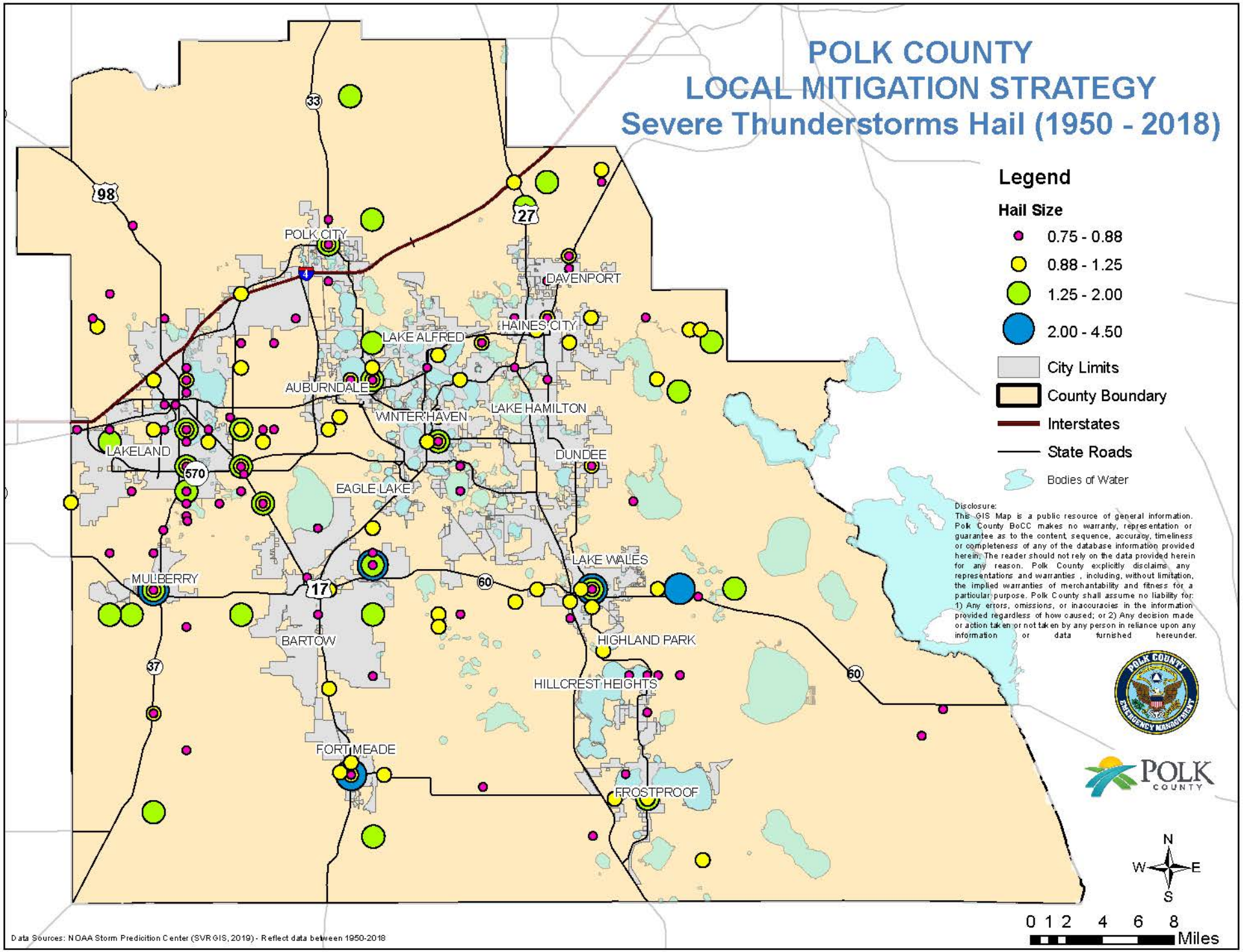
Document Path : D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\flood_floodplain_2020.mxd

POLK COUNTY
LOCAL MITIGATION STRATEGY
Potential Roadway Flooding



Data Sources: USGS, United States Census Bureau, Local MPOs, Florida Department of Transportation

Document Path: D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\flood_roadwayflood_2020.mxd


POLK COUNTY
LOCAL MITIGATION STRATEGY
Severe Thunderstorms Hail (1950 - 2018)
Legend
Hail Size
0.75 - 0.88
0.88 - 1.25
1.25 - 2.00
2.00 - 4.50
City Limits
County Boundary
Interstates
State Roads
Bodies of Water
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POLK COUNTY EMERGENCY MANAGEMENT
POLK COUNTY
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Miles
POLK CITY
DAVENPORT
HAINES CITY
LAKE ALFRED
AUBURNDALE
WINTER HAVEN
LAKE HAMILTON
LAKELAND
DUNDEE
EAGLE LAKE
LAKE WALES
MULBERRY
BARTOW
HIGHLAND PARK
HILLCREST HEIGHTS
FORT MEADE
FROSTPROOF
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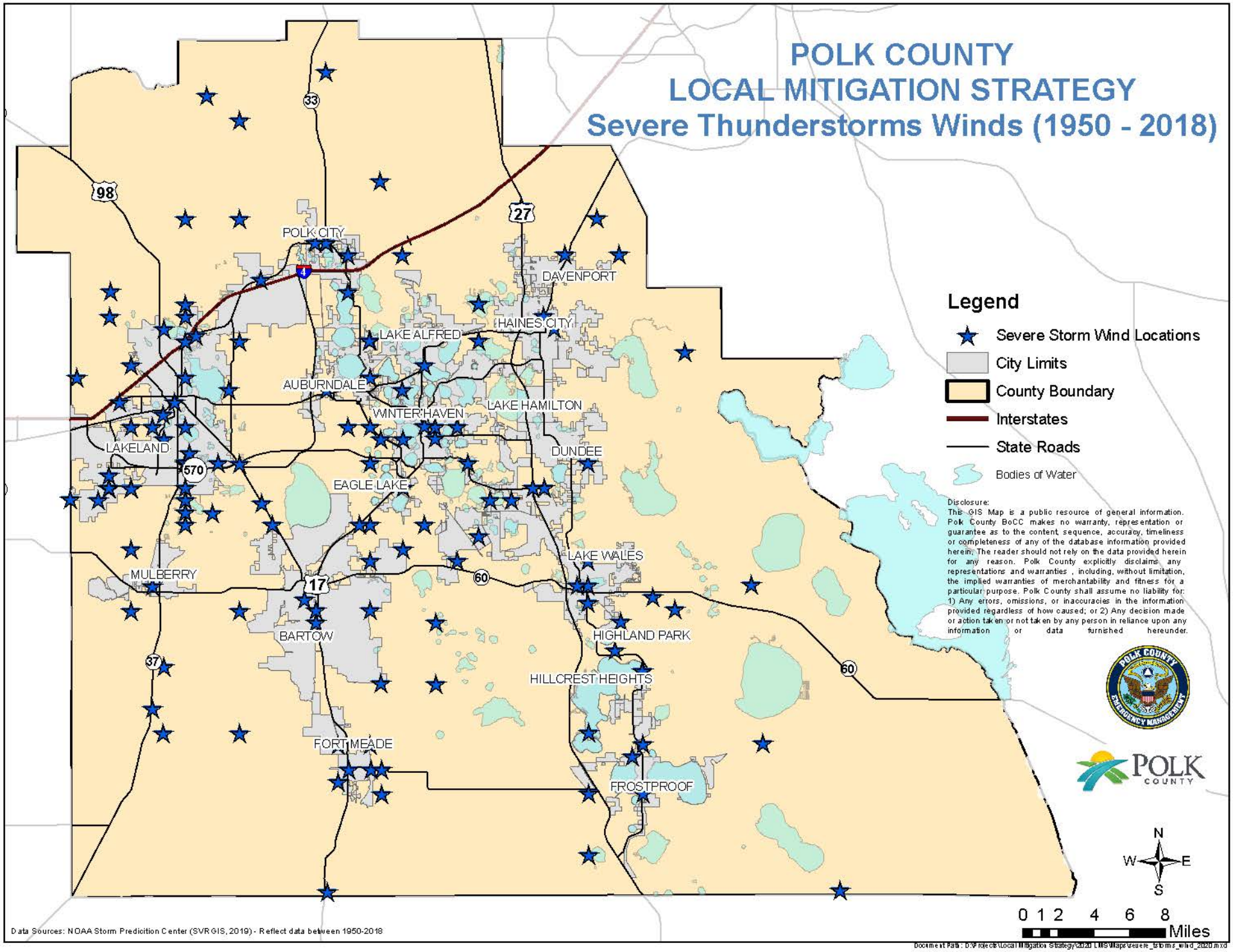
37
Data Sources: NOAA Storm Predicition Center (SVRGIS, 2019) - Reflect data between 1950-2018
Document Path: D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\severe_tstorm_hail_size_2020.mxd

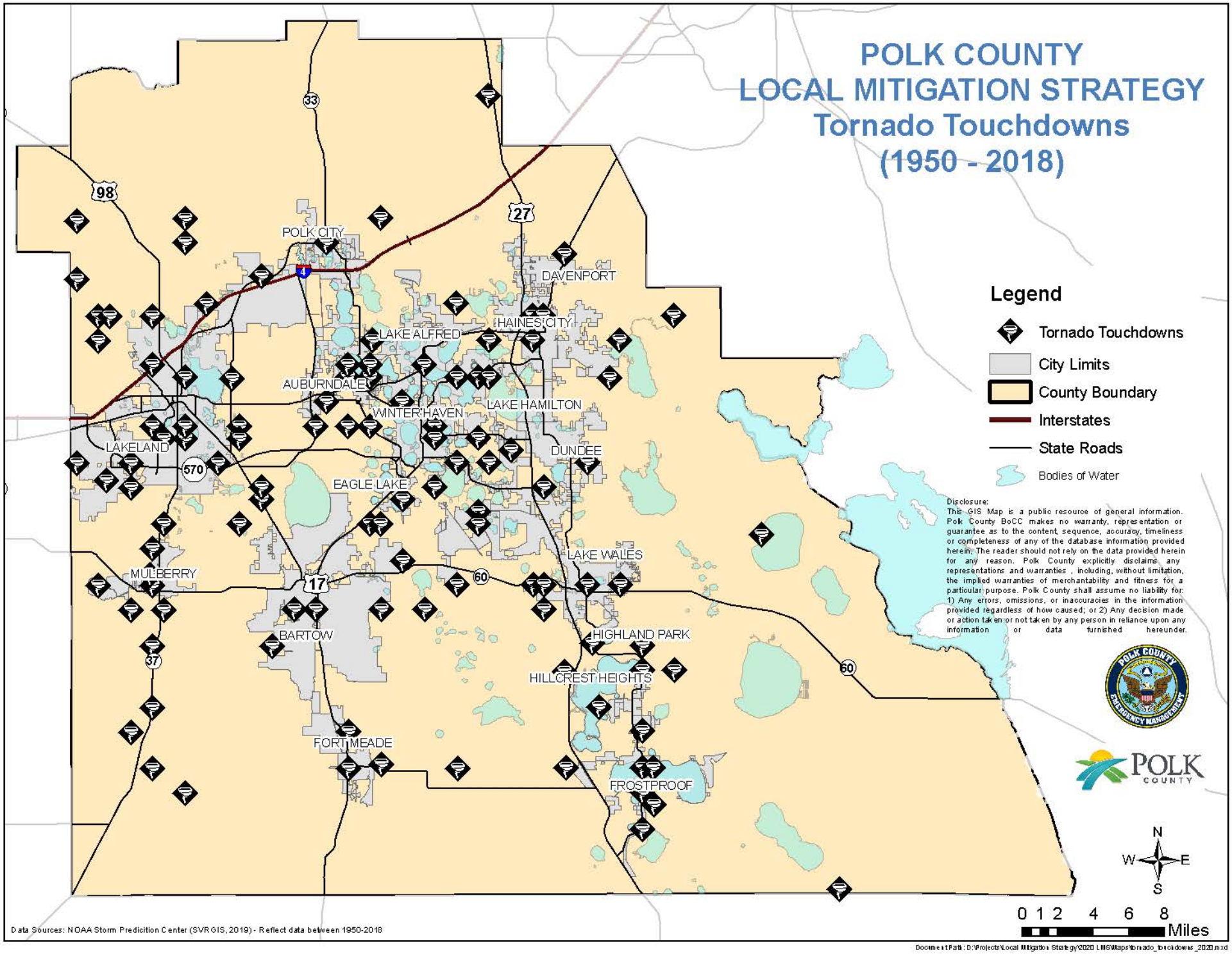
POLK COUNTY
LOCAL MITIGATION STRATEGY
Severe Thunderstorms Winds (1950 - 2018)



Data Sources: NOAA Storm Predicition Center (SVR GIS, 2019) - Reflect data between 1950-2018

Document Path : D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\severe_tstorms_wind_2020.mxd

POLK COUNTY
LOCAL MITIGATION STRATEGY
Tornado Touchdowns
(1950 - 2018)



Legend

- Tornado Touchdowns
- City Limits
- County Boundary
- Interstates
- State Roads
- Bodies of Water

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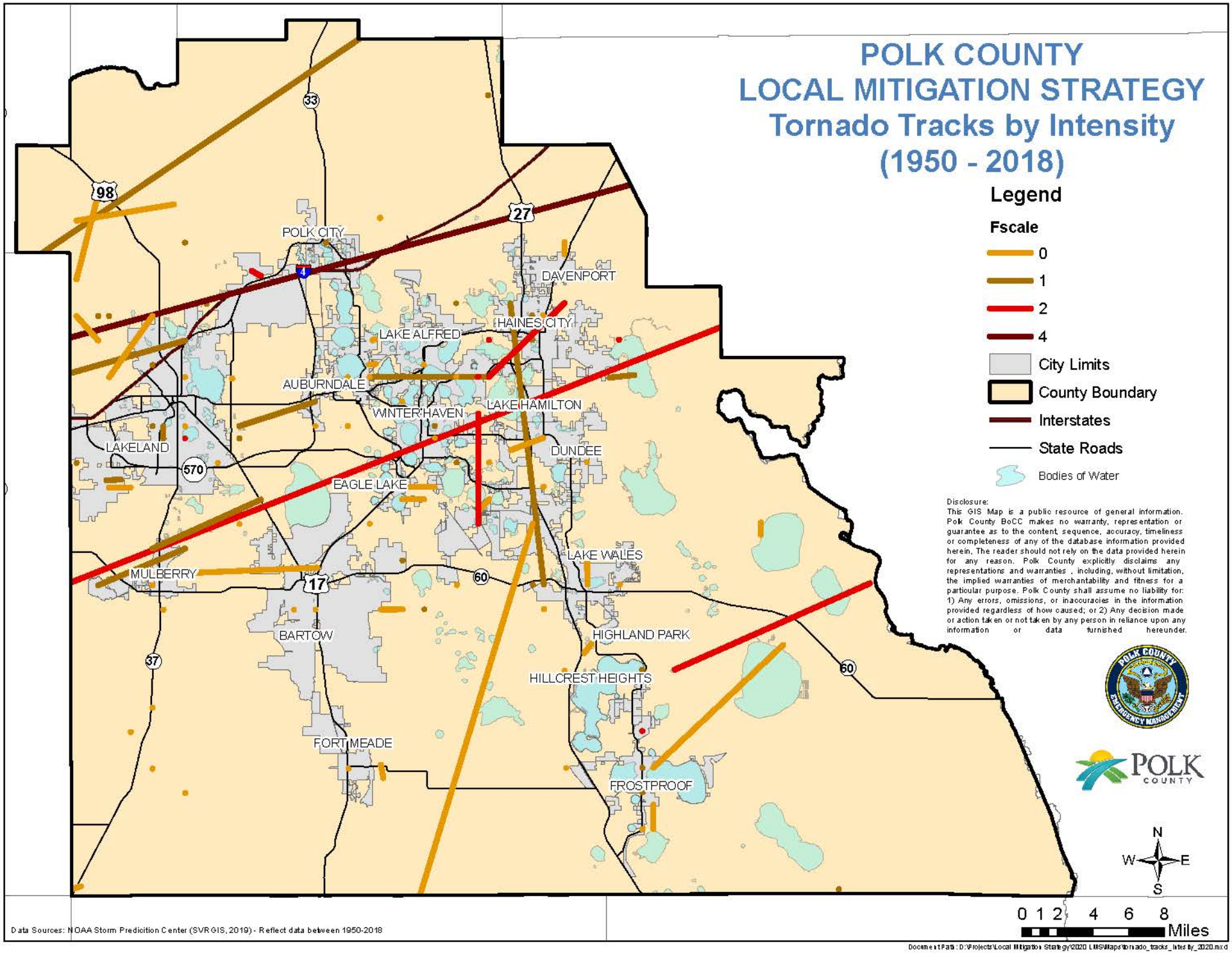
Miles

Data Sources: NOAA Storm Predicition Center (SVRGIS, 2019) - Reflect data between 1950-2018

Document Path: D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\tornado_touchdowns_2020.mxd


POLK COUNTY
LOCAL MITIGATION STRATEGY
Tornado Tracks by Intensity
(1950 - 2018)
Legend
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City Limits
County Boundary
Interstates
State Roads
Bodies of Water
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POLK CITY
DAVENPORT
HAINES CITY
LAKE ALFRED
AUBURNDALE
WINTER HAVEN
LAKE HAMILTON
LAKELAND
DUNDEE
EAGLE LAKE
LAKE WALES
MULBERRY
BARTOW
HIGHLAND PARK
HILLCREST HEIGHTS
FORT MEADE
FROSTPROOF
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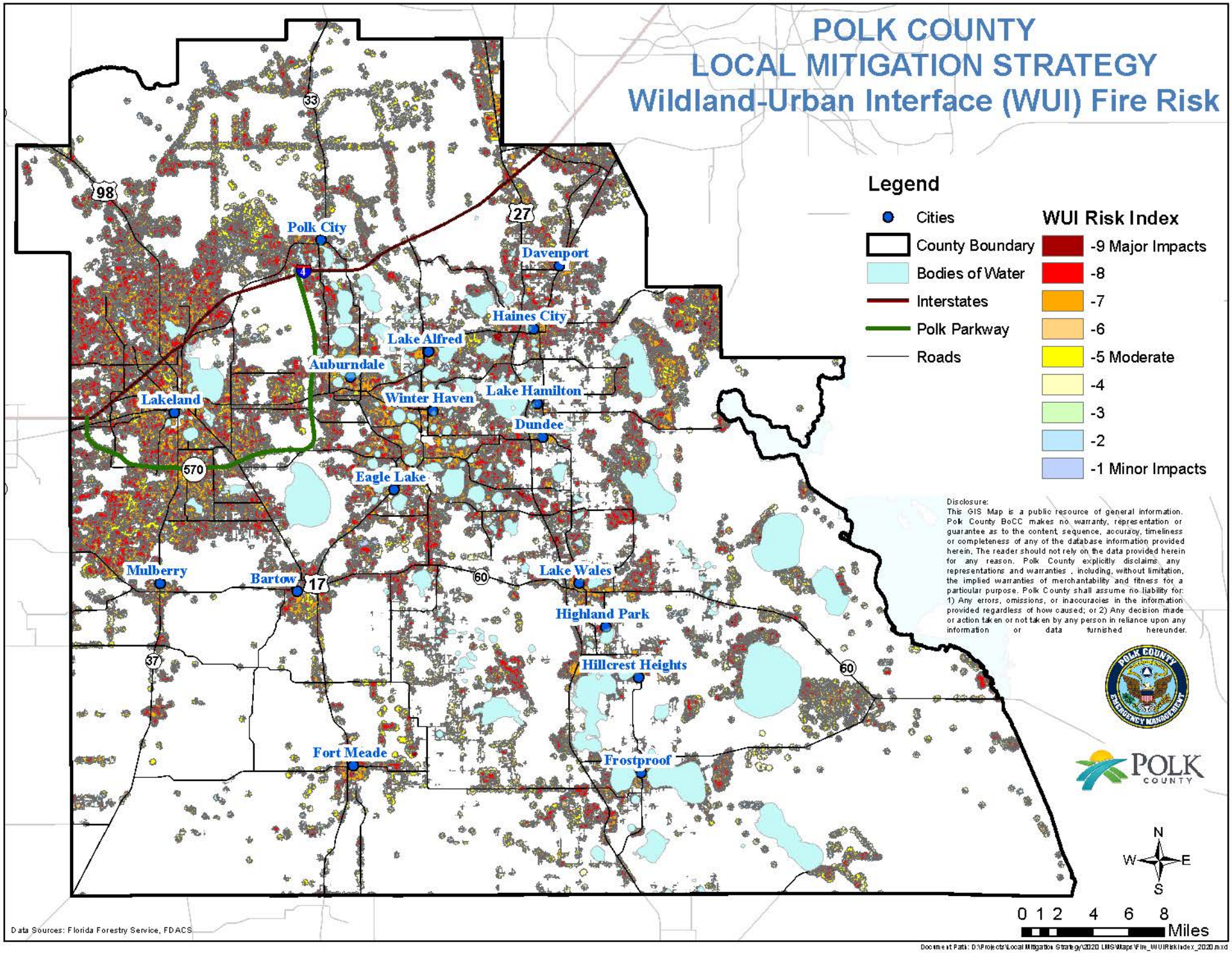
Data Sources: NOAA Storm Predicition Center (SVRGIS, 2019) - Reflect data between 1950-2018
Document Path : D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\tornado_tracks_intesity_2020.mxd

POLK COUNTY
LOCAL MITIGATION STRATEGY
Wildland-Urban Interface (WUI) Fire Risk



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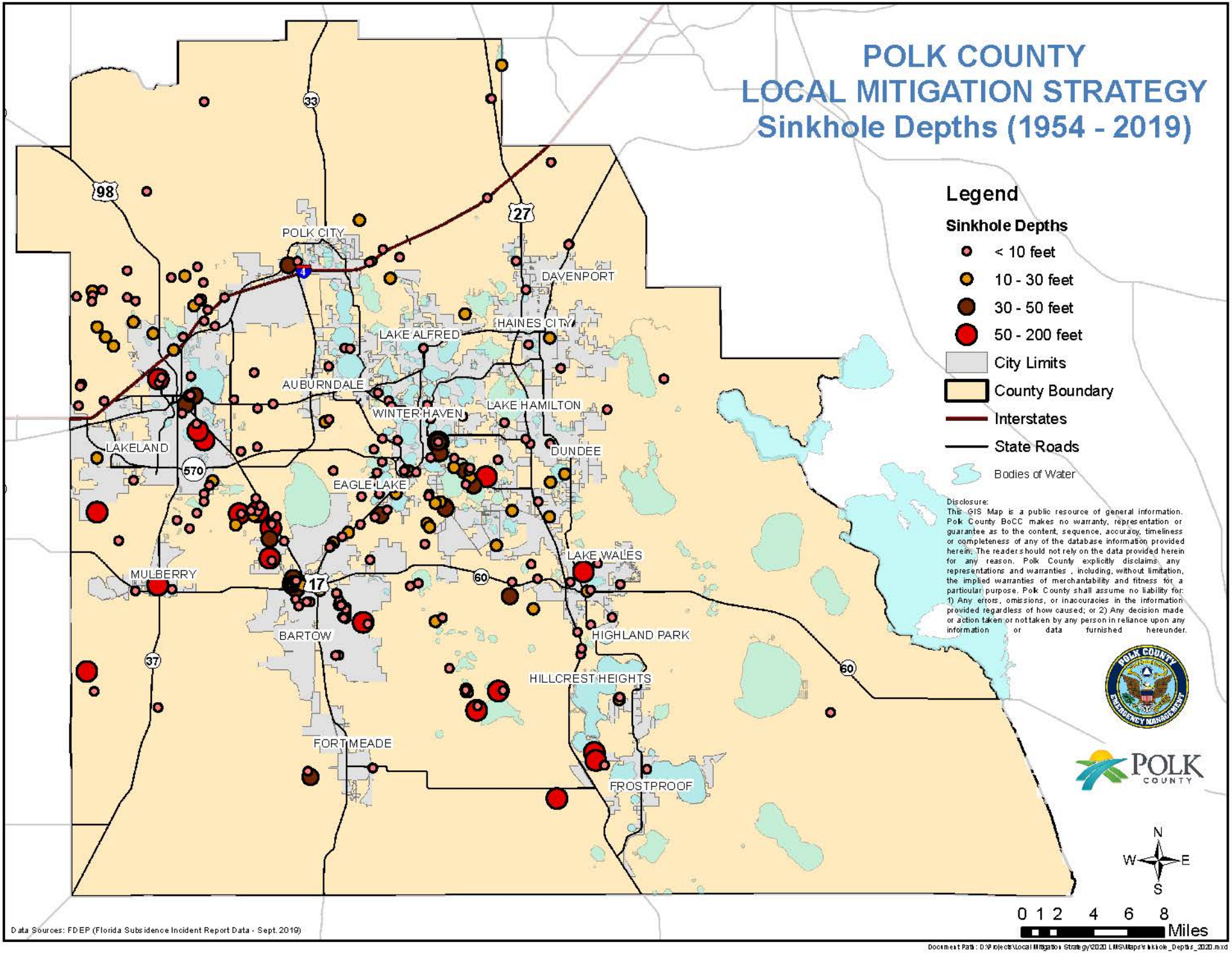
Data Sources: Florida Forestry Service, FDACS

Document Path: D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\Fire_WUIRiskIndex_2020.mxd


POLK COUNTY
LOCAL MITIGATION STRATEGY
Sinkhole Depths (1954 - 2019)
Legend
Sinkhole Depths
< 10 feet
10 - 30 feet
30 - 50 feet
50 - 200 feet
City Limits
County Boundary
Interstates
State Roads
Bodies of Water
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POLK COUNTY EMERGENCY MANAGEMENT
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Miles
POLK CITY
DAVENPORT
HAINES CITY
LAKE ALFRED
AUBURNDALE
WINTER HAVEN
LAKE HAMILTON
LAKELAND
DUNDEE
EAGLE LAKE
LAKE WALES
MULBERRY
BARTOW
HIGHLAND PARK
HILLCREST HEIGHTS
FORT MEADE
FROSTPROOF
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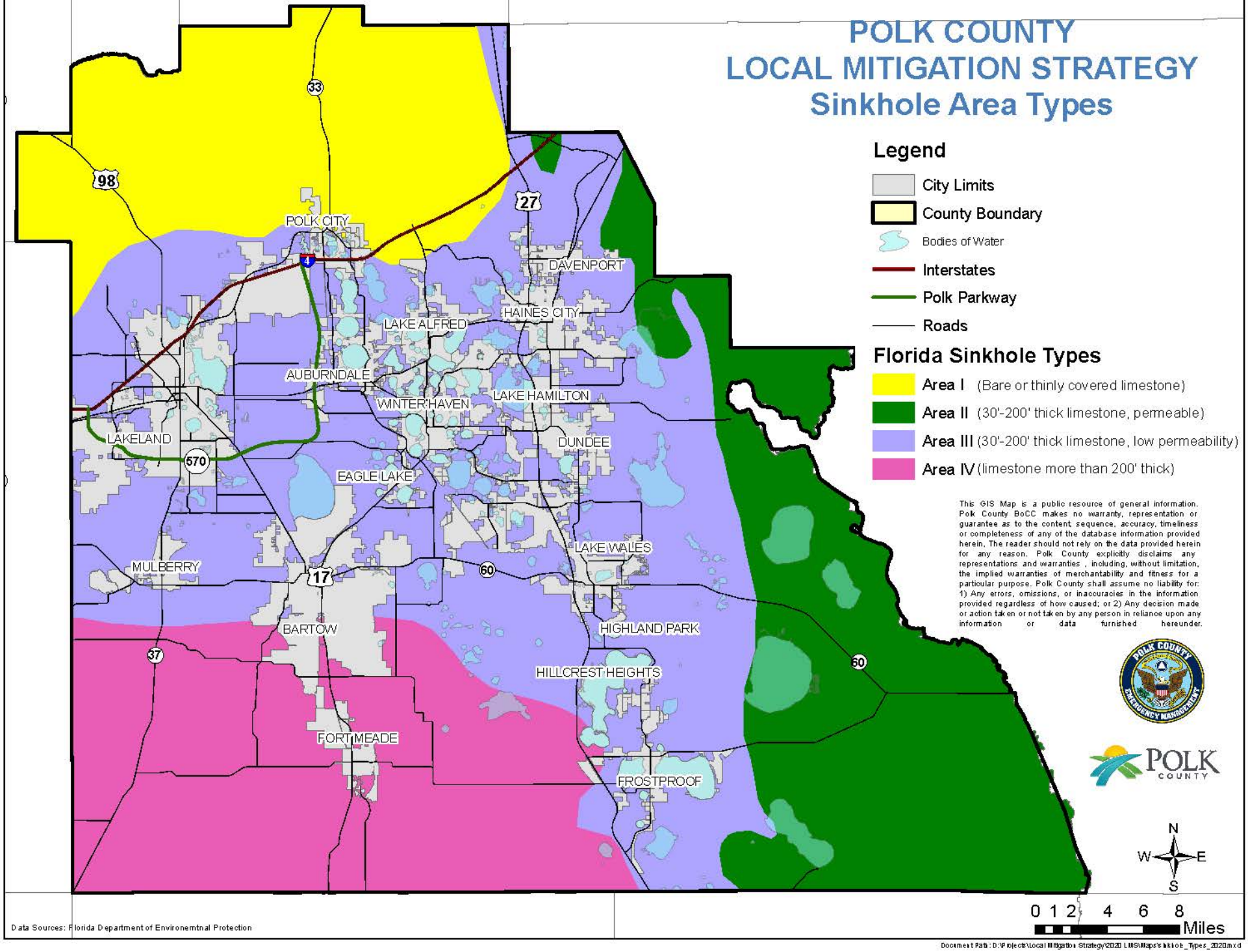
Data Sources: FDEP (Florida Subsidence Incident Report Data - Sept. 2019)
Document Path : D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\Sinkhole_Depths_2020.mxd

POLK COUNTY
LOCAL MITIGATION STRATEGY
Sinkhole Area Types



Legend

- City Limits
- County Boundary
- Bodies of Water
- Interstates
- Polk Parkway
- Roads

Florida Sinkhole Types

- Area I (Bare or thinly covered limestone)
- Area II (30'-200' thick limestone, permeable)
- Area III (30'-200' thick limestone, low permeability)
- Area IV (limestone more than 200' thick)

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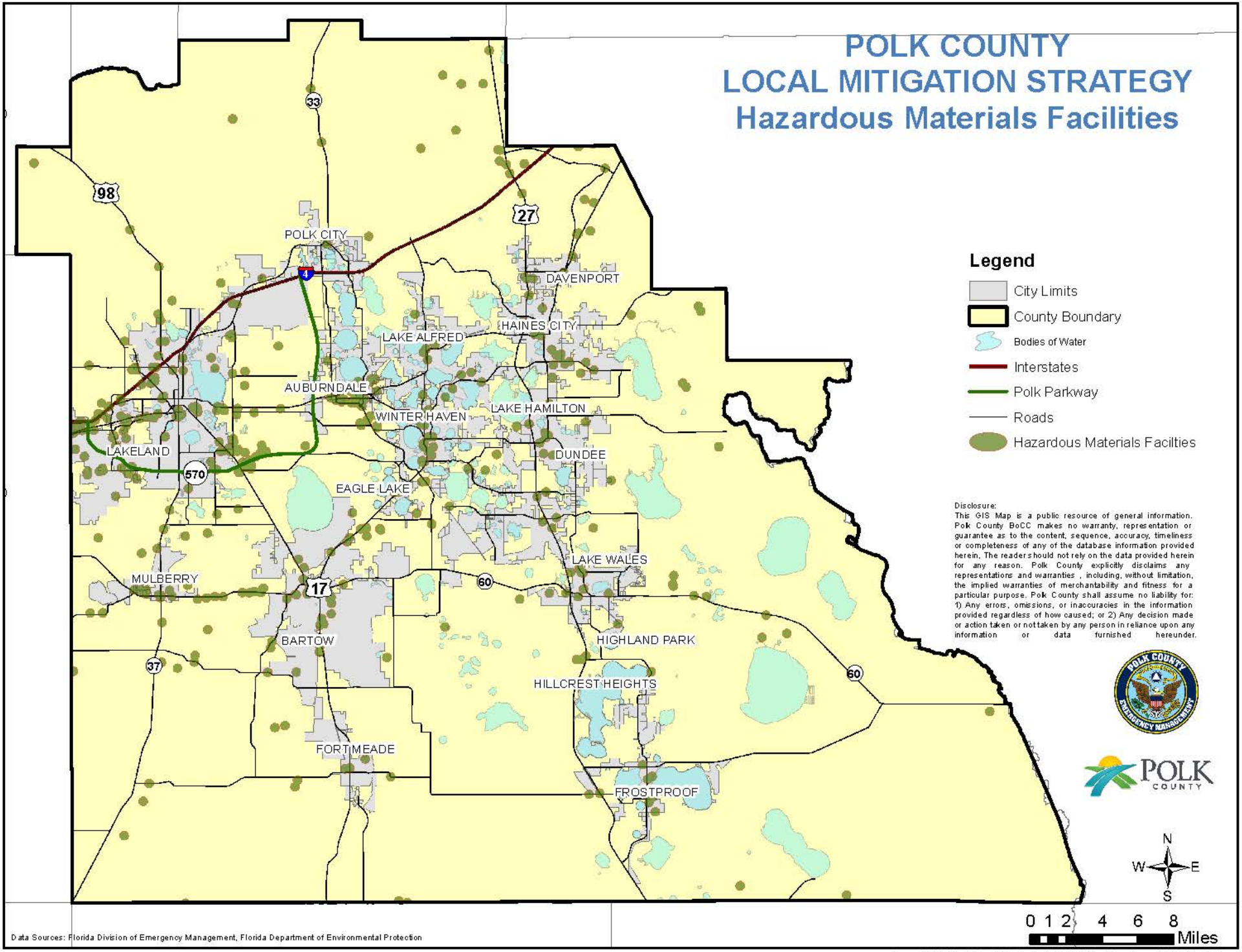
0 1 2 4 6 8 Miles

Data Sources: Florida Department of Environemtnal Protection

Document Path : D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\Sinkhole_Types_2020.mxd

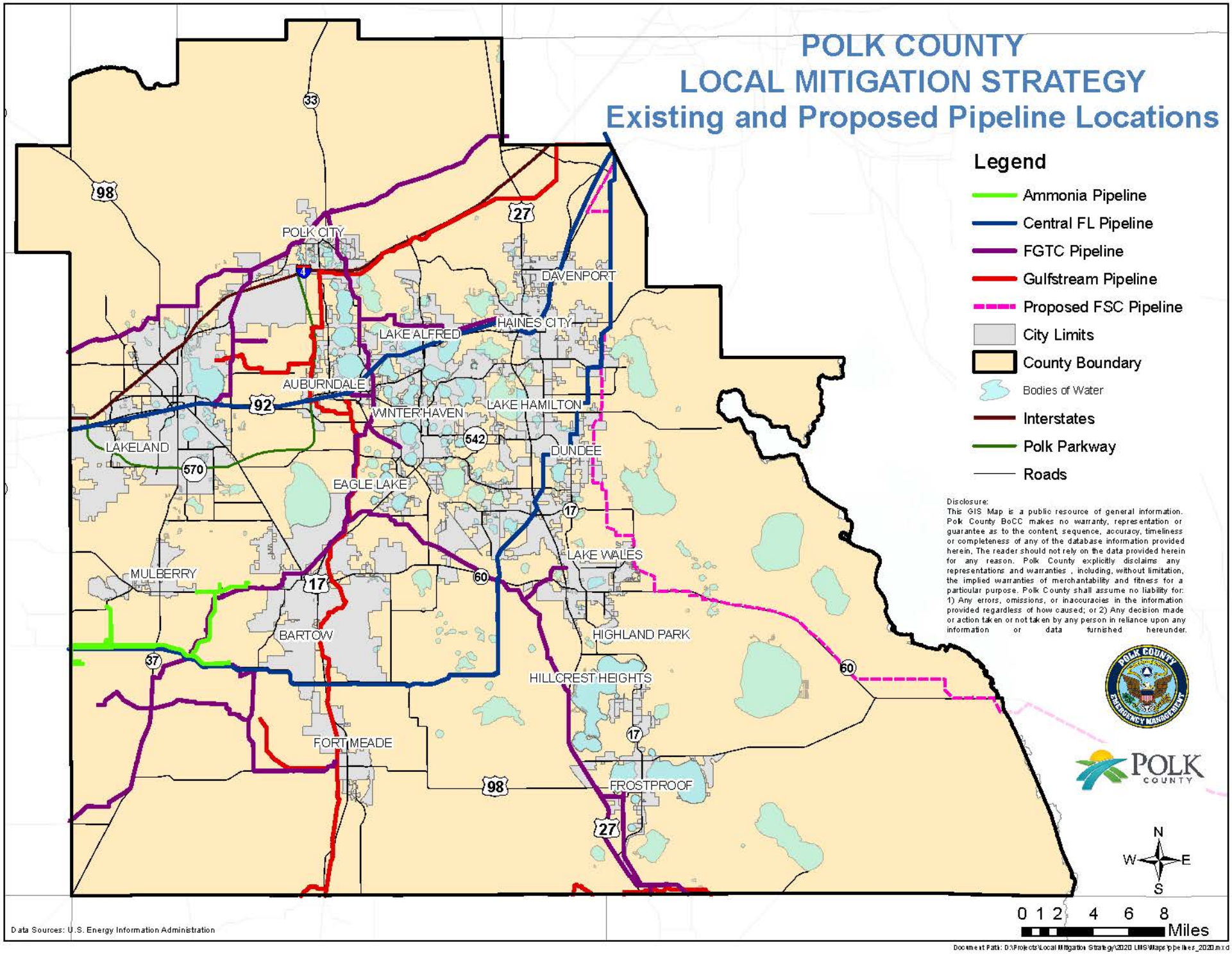
POLK COUNTY
LOCAL MITIGATION STRATEGY
Hazardous Materials Facilities



Data Sources: Florida Division of Emergency Management, Florida Department of Environmental Protection

Document Path: D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\hazardous_materials_facilities_2020.mxd

POLK COUNTY
LOCAL MITIGATION STRATEGY
Existing and Proposed Pipeline Locations



Data Sources: U.S. Energy Information Administration

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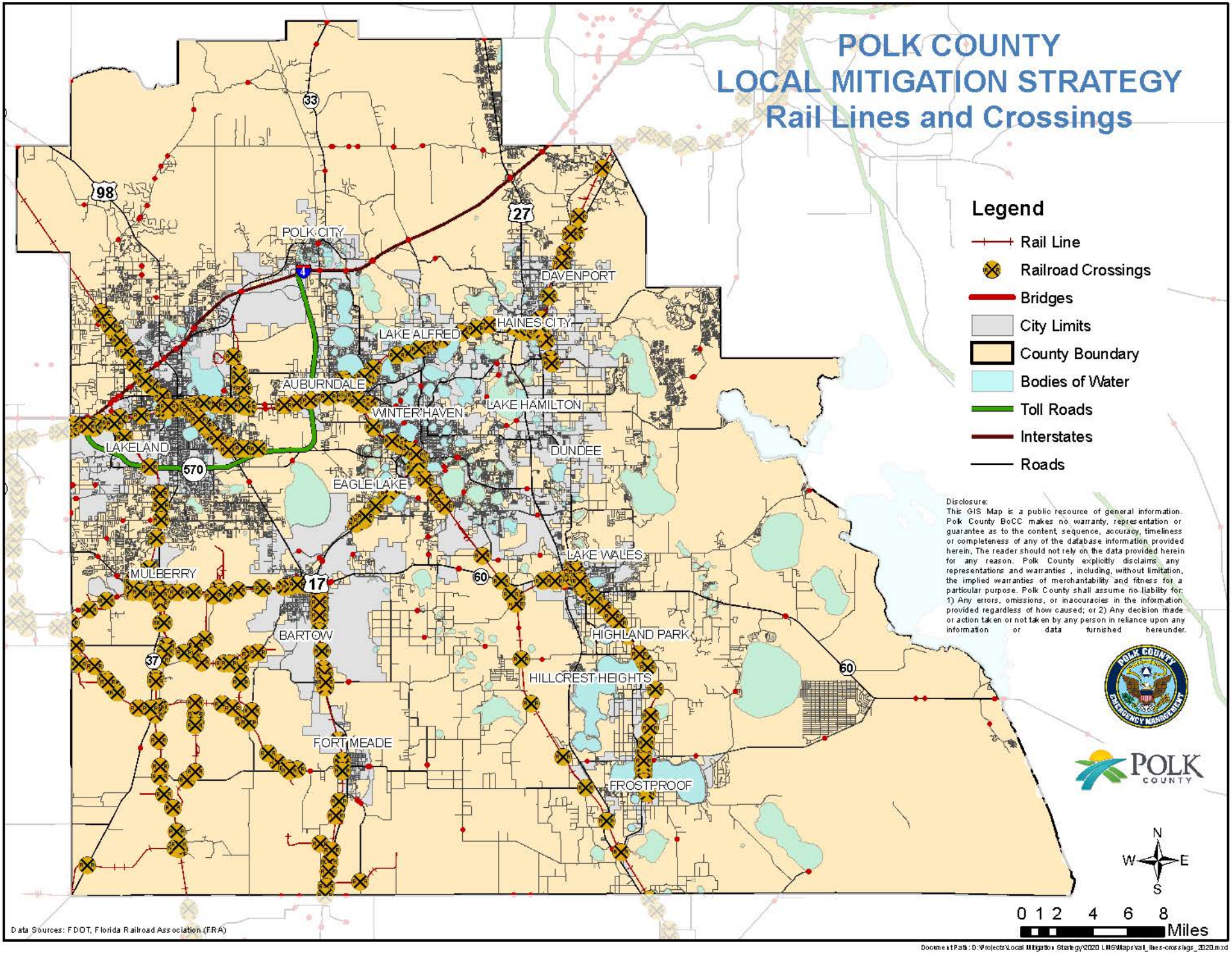
POLK COUNTY
LOCAL MITIGATION STRATEGY
Rail Lines and Crossings
Legend
Rail Line
Railroad Crossings
Bridges
City Limits
County Boundary
Bodies of Water
Toll Roads
Interstates
Roads
Disclosure:
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POLK COUNTY EMERGENCY MANAGEMENT
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Miles
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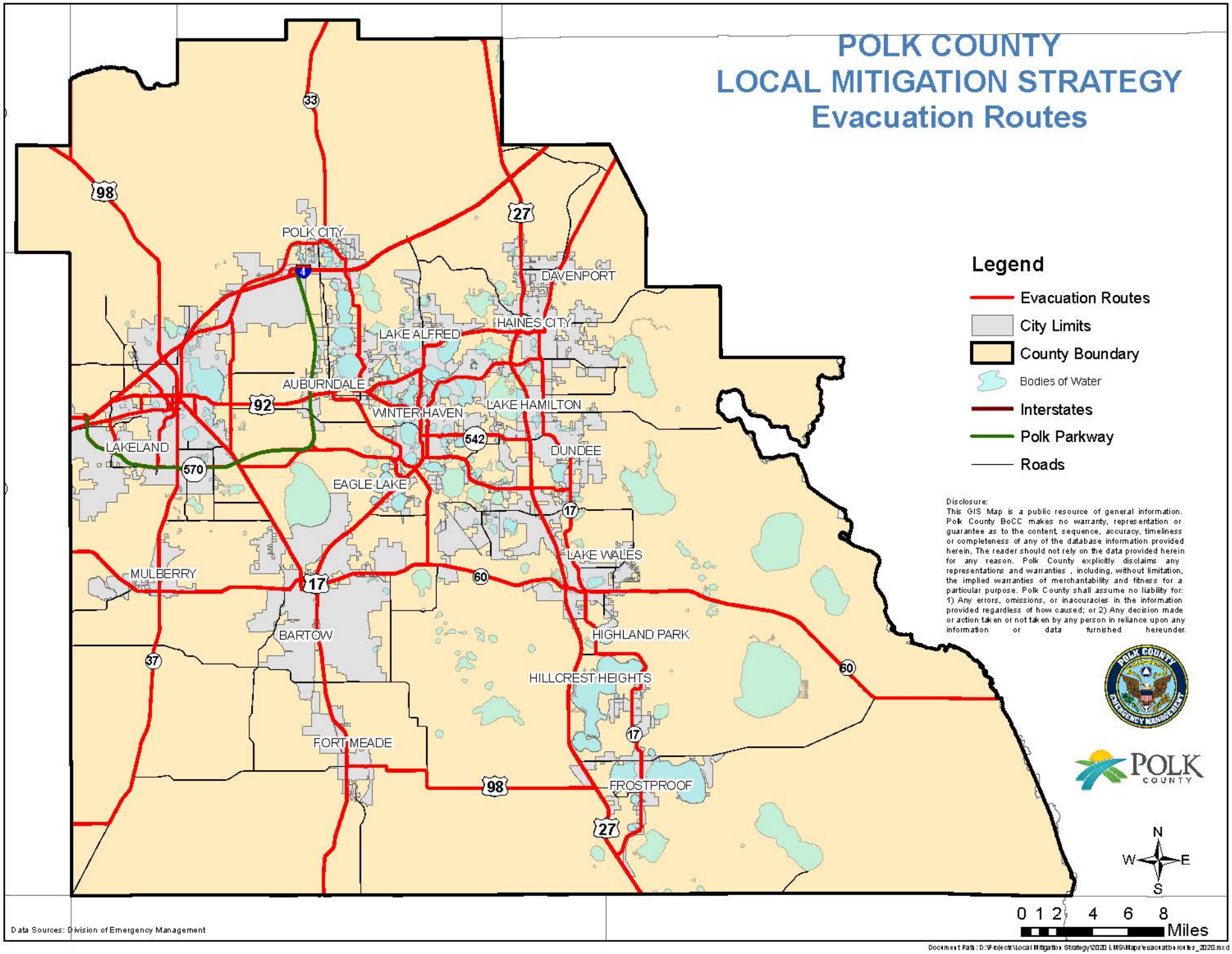
DAVENPORT
HAINES CITY
LAKE ALFRED
AUBURNDALE
WINTER HAVEN
LAKE HAMILTON
LAKELAND
DUNDEE
EAGLE LAKE
LAKE WALES
MULBERRY
BARTOW
HIGHLAND PARK
HILLCREST HEIGHTS
FORT MEADE
FROSTPROOF
33
98
27
4
570
17
60
37
Data Sources: FDOT, Florida Railroad Association (FRA)
Document Path: D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\rail_lines-crossings_2020.mxd

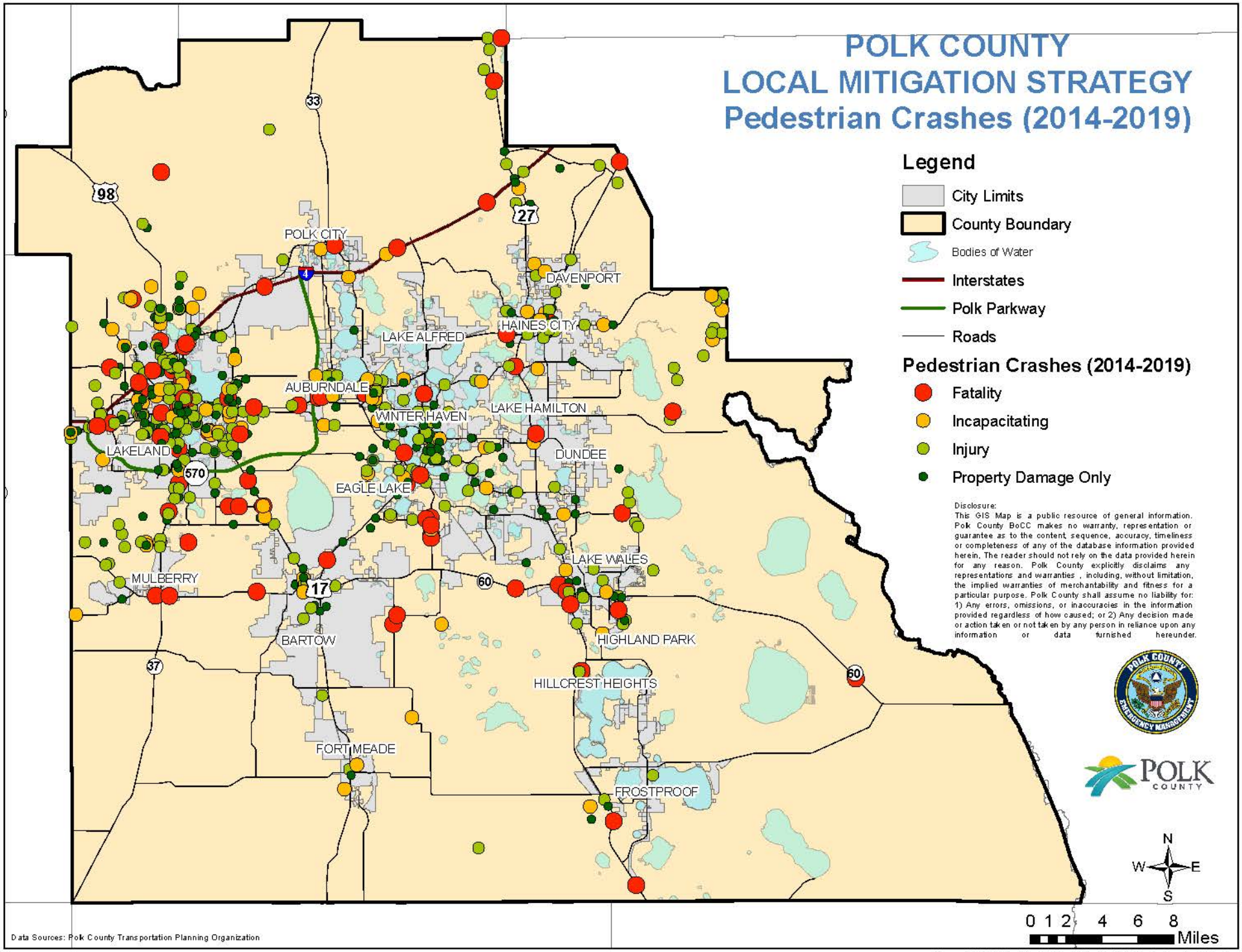
POLK COUNTY
LOCAL MITIGATION STRATEGY
Evacuation Routes



Data Sources: Division of Emergency Management

Document Path : D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\evacuationroutes_2020.mxd

POLK COUNTY
LOCAL MITIGATION STRATEGY
Pedestrian Crashes (2014-2019)



Legend

- City Limits
- County Boundary
- Bodies of Water
- Interstates
- Polk Parkway
- Roads

Pedestrian Crashes (2014-2019)

- Fatality
- Incapacitating
- Injury
- Property Damage Only

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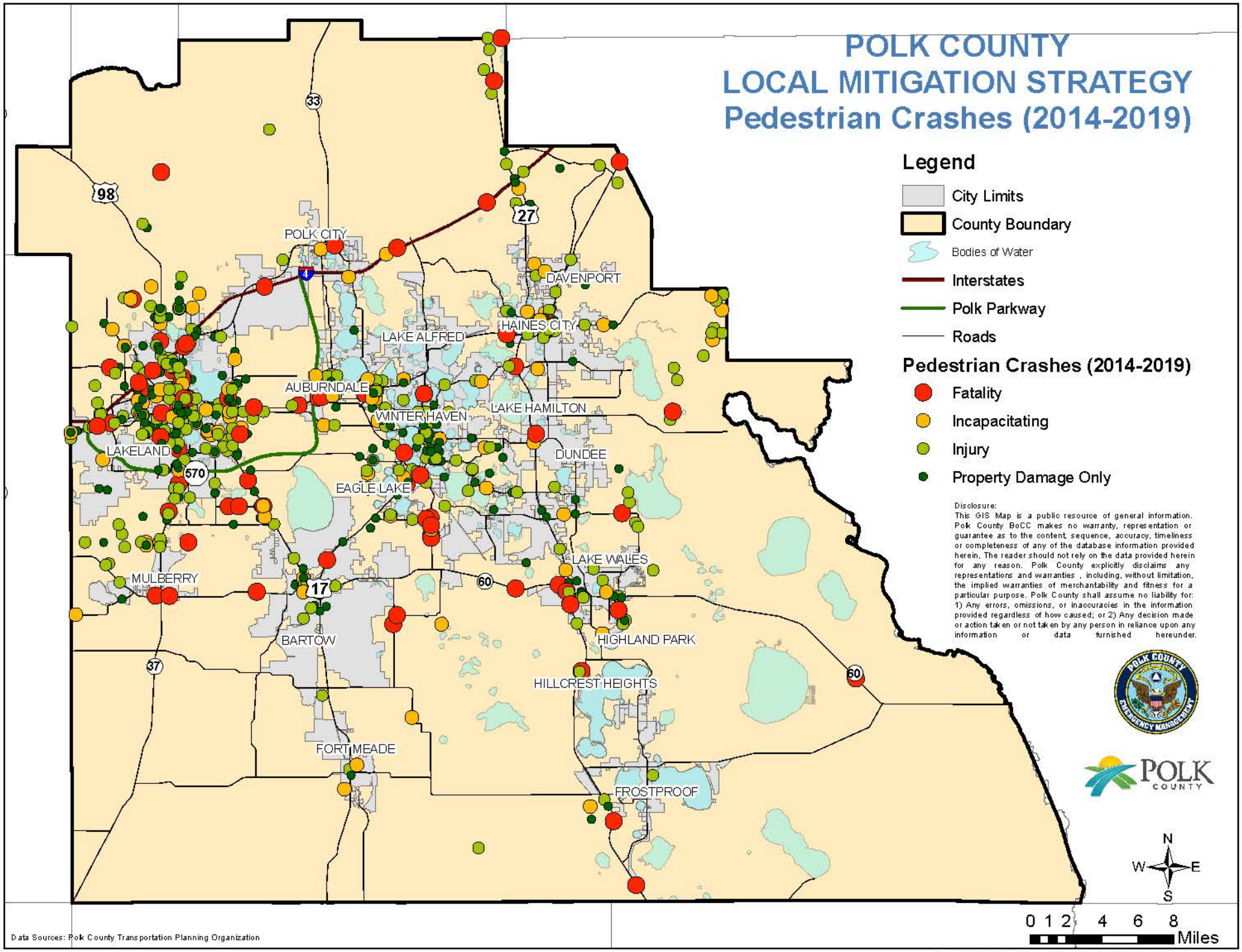
Data Sources: Polk County Transportation Planning Organization

Document Path : D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\Ped_crashes_2020.mxd

POLK COUNTY
LOCAL MITIGATION STRATEGY
Pedestrian Crashes (2014-2019)



Legend

- City Limits
- County Boundary
- Bodies of Water
- Interstates
- Polk Parkway
- Roads

Pedestrian Crashes (2014-2019)

- Fatality
- Incapacitating
- Injury
- Property Damage Only

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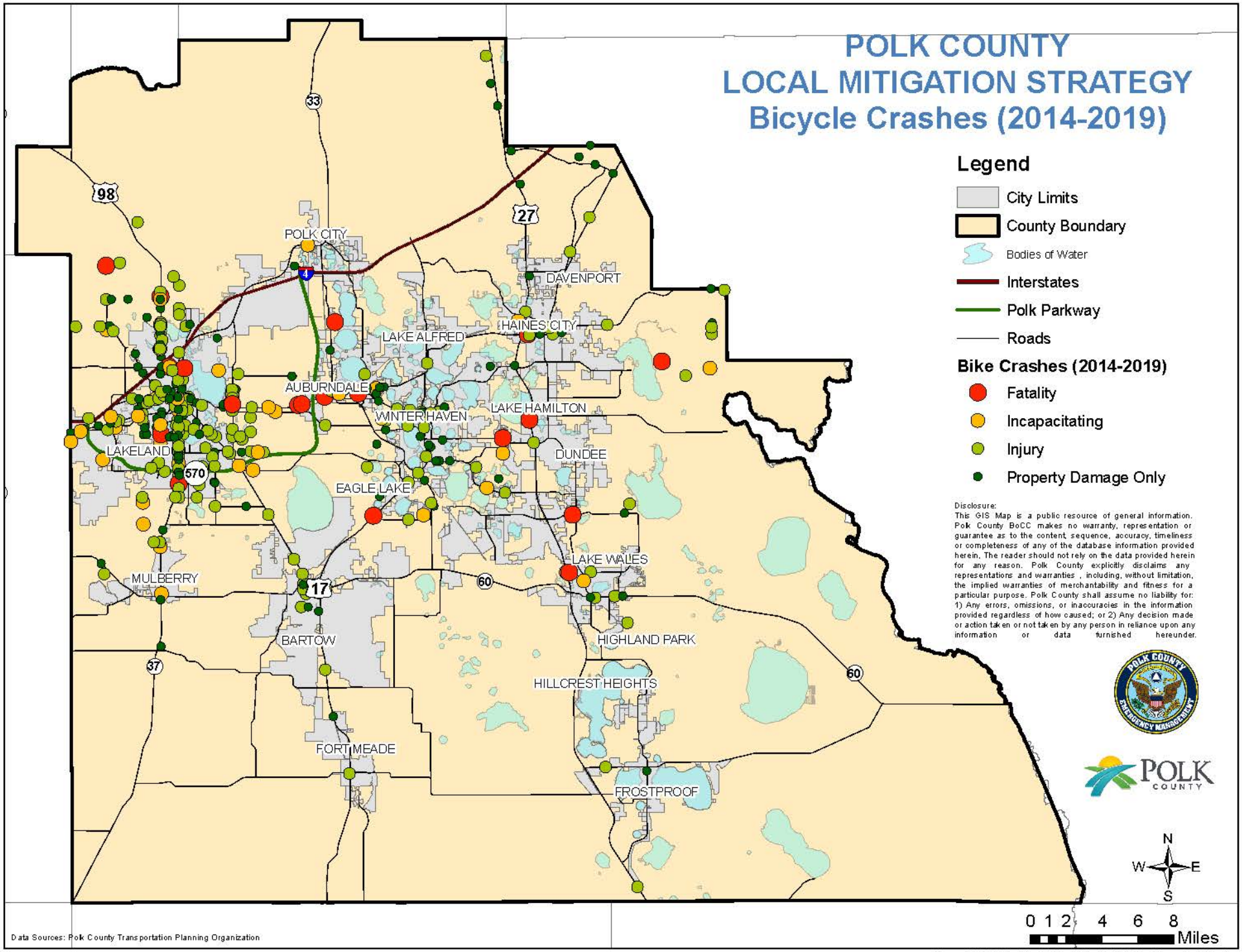
Data Sources: Polk County Transportation Planning Organization

Document Path : D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\Ped_crashes_2020.mxd

POLK COUNTY
LOCAL MITIGATION STRATEGY
Bicycle Crashes (2014-2019)



Legend

- City Limits
- County Boundary
- Bodies of Water
- Interstates
- Polk Parkway
- Roads

Bike Crashes (2014-2019)

- Fatality
- Incapacitating
- Injury
- Property Damage Only

Disclosure:
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Miles

Data Sources: Polk County Transportation Planning Organization

Document Path : D:\Projects\Local Mitigation Strategy\2020 LMS\Maps\Bike_crashes_2020.mxd

APPENDIX B

APPENDIX B – MITIGATION PROJECTS

Appendix B includes information pertaining to the mitigation projects of the LMS. The appendix includes the following items:

- Mitigation Action Project Submittal Form
- STAPLEE scoring for the projects included in the Mitigation Action Plan
- Mitigation Action Plan – List of Deferred, Completed, or Deleted Projects
- Mitigation Action Plan – Ongoing Projects
- Mitigation Action Plan – Mitigation Initiatives

POLK COUNTY
LOCAL MITIGATION STRATEGY WORKING GROUP
HAZARD MITIGATION NEW PROJECT/PROGRAM WORKSHEET

This form nominates facilities or projects for consideration by the Polk County Local Mitigation Strategy Working Group for inclusion in the LMS Mitigation Initiatives List. The form may only address one facility or project.

Instructions: Please complete all questions in a complete, concise manner. To check a box, double click on the appropriate box and select "checked" under the default value in the pop-up box. To write in a gray box, double click on the box and write text in the pop-up box.

Applicant Information:

- Date of Application:
- Name of Person Completing Form:
- Title:
- Employer:
- Address:
- Telephone
- Email:

Project/Program Information:

- Project/Program Name (or name of facility):
- Entities Impacted by Project:
- Facilities:
  - Physical Address:
  - Facility Owner:
  - What sector owns the facility:
    - ☐ Municipal
    - ☐ County
    - ☐ State
    - ☐ Federal
    - ☐ Special District
    - ☐ Non-Profit
    - ☐ Private

Project Description/Narrative:

Describe the proposed mitigation initiative, including the existing hazard(s), frequency of occurrence, community vulnerability, and explanation of how this initiative mitigates the hazard.

Project/program Category (Select One):

Project Category
- ☐ Capital Projects (CIP)
- ☐ Critical Facilities
- ☐ Flood Proofing
- ☐ Infrastructure
- ☐ Property Acquisition
- ☐ Restoration of Natural Features
- ☐ Retrofitting of Structures
- ☐ Stormwater Management

Program Category
- ☐ Stormwater Management
- ☐ Community Involvement
- ☐ Feasibility Studies
- ☐ Management Plan
- ☐ Development/Modification
- ☐ Public Education
- ☐ Public/Private Partnerships
- ☐ Regulatory Initiatives

Project Type:

Please identify the type of action proposed. Check all that apply.

☐ **Prevention** – Government administrative or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning and zoning, building codes, capital improvement programs, open space preservation, and storm water management regulations.

☐ **Property Protection** – Actions that involve the modification of existing buildings or infrastructure to protect them from a hazard, or removal from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, flood proofing, storm shutters, and shatter-resistant glass.

☐ **Public Education and Awareness** – Actions to inform and educate citizens, elected officials, and property owners about potential risks from hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.

☐ **Natural Resource Protection** – Actions that, in addition to minimizing hazard losses also preserve or restore the functions of natural systems. These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.

☐ **Structural Projects** – Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include storm water controls (e.g. culverts), floodwalls, seawalls, retaining walls, and safe rooms.

Level of Vulnerability:

Please identify the Hazard type that the action addresses. Check the box for the level of vulnerability. Refer to the Vulnerability Assessment Table for the Level of Vulnerability.

Hazard Type:

- ☐ High Level of Vulnerability
- ☐ Moderate Level of Vulnerability
- ☐ Low Level of Vulnerability
- ☐ No Vulnerability Identified

Hazard Type:

- ☐ High Level of Vulnerability
- ☐ Moderate Level of Vulnerability
- ☐ Low Level of Vulnerability
- ☐ No Vulnerability Identified

Timeliness:

The expected timeframe for completion and implementation of a project or program (upon receipt of funding). Please check the appropriate box.

- ☐ Less than one (1) year to complete or implement.
- ☐ More than one (1) year to complete or implement.

Matching Funds Availability:

Will the Local Recipient provide matching funds for the Project/Program? If so, please check the box for the amount of matching funds and identify the source.

- ☐ Local Recipient will provide 50% Match.
- ☐ Local Recipient will provide 25% Match.
- ☐ Local Recipient will provide 12 ½ % Match.
- ☐ Local Recipient will provide ____% Match.
- ☐ No Match will be provided.

Potential Funding Sources:

STAPLEE ANALYSIS OF PROPOSED INITIATIVE

SOCIAL:

- Will this action easily gain community acceptance? ☐ Yes ☐ No
- Will this action have an adverse effect on any one segment of the population?
  ☐ Yes ☐ No ☐ N/A
  - If yes, please explain:
- What effects will the action have on the social, historic, and cultural environment of the community?

TECHNICAL:

- Is this action technically feasible and does it provide the appropriate level of protection?
  ☐ Yes ☐ No
- Is this action a long-term solution?
  ☐ Yes ☐ No
- What types of technical/professional expertise will be required to implement the project?
  - Is this expertise available? ☐ Yes ☐ No
  - If so, what is the cost?
- Will the action create more problems than it solves? ☐ Yes ☐ No
- How long will it take to complete the project?
  ☐ Less than 1 year ☐ More than 1 year
  Is this a reasonable timeframe? ☐Yes ☐No

ADMINISTRATIVE:

- Does the community have the capability (staff, expertise, time, funding) to implement the action?
  ☐ Yes ☐ No
  If no, please explain what is lacking:
- Does the Community have funding secured and allocated for the project?
  ☐ Yes ☐ No ☐ N/A
- Can the community provide the necessary maintenance of the project?
  ☐ Yes ☐ No ☐ N/A

POLITICAL:

- Is the mitigation action politically acceptable? ☐ Yes ☐ No
- Is there a local champion for the project to lead the effort? ☐ Yes ☐ No
- Will the general public support or oppose the project?
  ☐ Support ☐ Oppose

LEGAL:

- Does the community have the authority to implement the action?
  ☐ Yes ☐ No
- Are there legal side effects? Could the mitigation action be construed as a taking?
  ☐ Yes ☐ No
- Will the action comply with local, State, and Federal environmental regulations?
  ☐ Yes ☐ No
- Do homeowner association bylaws or deed restrictions apply to the project?
  ☐ Yes ☐ No ☐ N/A
- Is the action likely to be challenged by stakeholders whose interests may be adversely affected?
  ☐ Yes ☐ No ☐ N/A

ECONOMIC:

- Do the costs of the action seem reasonable for the size of the problem and the likely benefits?
  ☐ Yes ☐ No
- What burden will be placed on the local economy to implement and maintain the action? (Note: Just because an action has costs associated with it does not mean those costs are automatically a burden on the economy)
  ☐ None ☐ Minimal ☐ Moderate ☐ Heavy
  - Please explain any response other than NONE:
- Will the action generate additional jobs locally? ☐ Yes ☐ No
- Does the action contribute to other community goals, such as capital improvements or economic development? ☐ Yes ☐ No

ENVIRONMENTAL:

- Is the proposed action in a floodplain or wetland or will it indirectly impact the natural and beneficial functions of a floodplain or wetland? ☐ Yes ☐ No
  - If yes, please explain:
- How will the action affect the natural environment?
- Will the action require environmental regulatory approvals?
  ☐ Yes ☐ No
- How will the action affect utility (e.g. stormwater) and transportation systems?

STAPLEE ACTION EVALUATION TABLE

STAPLEE Criteria Considerations																														
1=Favorable 0=Neutral -1=Less Favorable Multiply by number in parenthesis																														
			S (Social)			T (Technical)					A (Administrative)			P (Political)			L (Legal)					E (Economic)				E (Environmental)			
Category	Entity	Project Description	Community Acceptance	Effect of Segment of Population	Effect of Community (2)	Technically Feasible (3)	Long-term Solution	Expertise Required & Available (2)	Reasonable Timeframe	Secondary Impacts	Capability to Implement	Funding Allocated	Community Provide Maintenance (3)	Politically Acceptable	Local Champion	Public Support	Authority to Implement (2)	Comply with Environmental Regulations (3)	Legal Side Effects/Taking	HOA Bylaws/Deed Restrictions	Potential Legal Challenge	Reasonable Cost (2)	Burden on Economy	Contributes to Economic Goals (2)	Additional Jobs (2)	Impact Floodplain/Wetland (3)	Natural Environment	Environmental Regulatory Approvals (2)	Utility and Transportation Systems		

Polk County LMS Update on Deferred, Completed, or Deleted Mitigation Project Initiatives
August 4, 2020

Jurisdiction Benefitted	Jurisdiction (Location of Project)	Project Name	Project Type	Description	Mitigation Goal(s) Addressed	Hazard Mitigated*	Address New or Existing	Responsible Agency	Estimated Cost	Possible Funding Source(s)	Time to Complete	Deferred, Completed, or Deleted	If Deleted or Deferred, Why?
Auburndale	Auburndale	Alberta Street Drainage Improvement	Drainage	Relieves flooding and drainage problem at major intersection on Alberta St	5,6,9	Flood	Both	Auburndale	$500,000	HMGP, FMA	12-18 Months	Deferred	Ongoing Project, Working on Plans
Auburndale	Auburndale	Highway 92, Lakeshore and Beach Lift Station Generator Project	Infrastructure	Highway 92, Lakeshore and Beach Lift Station Generator Project	3.4, 6.2, 6.3	All	Both	Auburndale	$189,995.00	HMGP	12-18 Months	Deferred	Ongoing Project, Working on Plans
Bartow	Bartow	City-wide Sewer Improvements	Stormwater Improvement, Building Retrofit	Provide improvements to 14,700 linear feet of gravity sewer, 25 manholes, and the airbase master lift station	2,8,9	Flood, Storms	Existing	Bartow	$1,500,000	HMGP	12-18 Months	Completed	
Bartow	Bartow	City-wide Stormwater Improvements	Stormwater Improvement	Provide needed improvements to substandard stormwater infrastructure	8,9	Flood, Storms	Both	Bartow	$13,000,000	HMGP	12-18 Months	Completed	
Bartow	Bartow	Polk Street and Carver Recreation Center Retrofits	Building Retrofits	Retrofit the Polk St. Recreation Center and Carver Recreation Center to be used by nearby residents as hurricane shelters	1,2,10	Storms	Existing	Bartow	$35,000	HMGP	12-18 Months	Deleted	Project is not cost effective
All	All	Public Education/Outreach	Education, Public Awareness	Ongoing mitigation initiative designed to mitigate the impact of various disasters by educating residential and commercial property owners of the hazards they face, vulnerability from hazards, and action s they can take to reduce the impacts of these hazards before they occur. Activities include participation in the National Weather Service Weather Ready Nation/Storm Ready program, partnerships with the Lakeland Flying Tigers minor league baseball team to host the annual Ready Night, use of social medial, and other outreach mechanisms.	1,2, 5	All	Both	County Public Safety Departments (Fire, EMS, E-911, etc)	$25,000	Public Safety Admin	Annual and Bi-annual	Deferred	Ongoing project
Davenport	Davenport	Critical Facility Wind Retrofit	Property Protection	Wind Retrofit to City Admin Builiding that houses Fire, Police and Public Works operations.	1,2	Wind	Existing	Davenport	$160,000	HMGP	9-12 Months	Deferred	on-going project
Davenport	Davenport	Phase I and Phase II Drainage Studies	Drainage	Area experienced flooding in yards due to inadequate drainage system. Phase I - feasibility study to determine how to handle stormwater runoff; phase II - construction, if feasible. (Matching funds may be available through Neighborhood Revitalization)	5,6,9	Flood	Both	Davenport	$2,100,000	HMGP	12-18 Months	Completed	Completed
Frostproof	Frostproof	Bass Property Purchase	Land Acquisition	Purchase of home and property damaged due to flooding (Bass)	5,6,9	Flood	Existing	Frostproof	$29,840	HMGP, FMA	12-18 Months	Deferred	Awaiting funds
Frostproof	Frostproof	Johnston Property Purchase	Land Acquisition	Purchase of home and property damaged due to flooding (Johnston)	5,6,9	Flood	Existing	Frostproof	$53,510	HMGP, FMA	12-18 Months	Deferred	Awaiting funds
Frostproof	Frostproof	Keen Park Road Drainage Project	Drainage	Area experienced flooding in yards and roads. Project will re-establish drainage ditches Keen Park Road	5,6,9	Flood	Both	Frostproof	$50,000	HMGP	12-18 Months	Deferred	Awaiting funds
Frostproof	Frostproof	City Hall Building Retrofit	Building Retrofit	Retrofit of critical facilities/window protection to City Hall (Frostproof)	1,2,5,10	Storms	Existing	Frostproof Public Works	$150,000	HMGP, EMPA	12-18 Months	Deferred	Awaiting funds
Frostproof	Frostproof	Fire/EMS Building Retrofit	Building Retrofit	Retrofit/harden Fire Dept/EMS station (Frostproof)	1,2,5,10	Storms	Existing	Frostproof Public Works	$150,000	HMGP, EMPA	12-18 Months	Deferred	Awaiting funds
Frostproof	Frostproof	Magnolia Ave Stormwater Project	Drainage	Magnolia Ave. drainage, increase pipe diameter for proper stormwater run off (Frostproof)	8,9	Flood	Both	Frostproof Public Works	$100,000	FMA,HMGP,Capitalization Grants for Clean Water State Revolving Funds, Nonpoint Source Implementation Grants, Watershed Protection and Flood Prevention Program	12-18 Months	Deferred	Awaiting funding. In process of watershed management plan to outline and apply for grant in FY20/21
Golden Lakes Community Development District	Golden Lakes Community Development District	Eaglebrooke North Pond A1	Drainage	Eaglebrooke North Pond A1	2.5, 4.2, 4.5, 5.1, 5.3	Flood	Both	Golden Lakes Community Development District	$244,000.00	HMGP	12-18 Months	Deferred	Awaiting FEMA hazard Mitigation Grant Funding Approval
City of Haines City	City of Haines City	Grace Avenue and Robinson Drive Drainage	Drainage	Grace Avenue and Robinson Drive Drainage	3.1, 5.1, 5.3	Flood	Both	Haines City	$205,700.00	HMGP	12-18 Months	Deferred	Funding not available

Polk County LMS Update on Deferred, Completed, or Deleted Mitigation Project Initiatives
August 4, 2020

Jurisdiction Benefitted	Jurisdiction (Location of Project)	Project Name	Project Type	Description	Mitigation Goal(s) Addressed	Hazard Mitigated*	Address New or Existing	Responsible Agency	Estimated Cost	Possible Funding Source(s)	Time to Complete	Deferred, Completed, or Deleted	If Deleted or Deferred, Why?
Haines City	Haines City	Lift Station Improvements (18 Sun Air Blvd)	Building Retrofit	Due to low elevation, lift station floods and pump shorts out. Recommend raising lift station and replace current pump with submersible. 18 Sun Air Blvd. W	3,9	Flood	Existing	Haines City	$250,000	HMGP	12-18 Months	Completed	
Haines City	Haines City	Phase I and Phase II Drainage Studies	Drainage	During recent storms, area flooded and was pumped. Phase I - feasibility study; Phase II - construction, if feasible.	5,6,9	Flood	Both	Haines City	$200,000	HMGP	12-18 Months	Completed	
Bartow	Bartow	City-Building Facility Upgrade	Building Retrofit, Critical Facilities	Upgrade facility to serve as back up HQ for PCHD, upgrade roof, modify building to support 2 coolers for critical pharmaceuticals, modify electric system and install generator	1,2,10	All	Existing	Health Department	$250,000	HMGP	12-18 Months	Deleted	Project is not cost effective
City of Lake Alfred	City of Lake Alfred	Lift Station Generator	Infrastructure	Lift Station Generator	3.4, 6.2, 6.3	All	Both	Lake Alfred	$208,500.00	HMGP	12-18 Months	Deferred	Funding not available
City of Lake Alfred	City of Lake Alfred	Public Safety Complex Generator	Infrastructure	Public Safety Complex Generator	3.4, 6.2, 6.3	All	Both	Lake Alfred	$89,980.00	HMGP	12-18 Months	Deferred	Funding not available
Lake Region Lakes Management District	Lake Region Lakes Management District	Wahneta Drainage Improvement	Land Acquisition, Drainage	Wahneta Drainage Improvement	3.1, 5.1, 5.3	Flood	Both	Lake Region Lakes Management District	$2,000,000.00	HMGP	12-18 Months	Deferred	Haven't received funds, applying for required permits.
Lake Wales	Lake Wales	City Administration Building Retrofit	Building Retrofit	Lake Wales plans to retrofit city admin building, LWPD HQ, LWFD/EOC, Austin Center upgrade roof and add shutters	1,2	Storms	Existing	Lake Wales	$750,000	HMGP	12-18 Months	Completed	
Lakeland	Lakeland	Cardinal St/Robin St Drainage Improvements	Drainage	Outfall in area is inefficient. Design, permit and construct efficient outfall. Cardinal St./Robin St	5,6,9	Flood	Both	Lakeland	$75,000	HMGP	12-18 Months	Deferred	Funding not available
Lakeland	Lakeland	Drainage Improvement in Residential Areas	Drainage	Residences and roads flood during excessive rain. Project consists of providing positive outfall for drainage.	5,6,9	Flood	Both	Lakeland	$1,000,000	HMGP	12-18 Months	Deferred	Funding not available
Lakeland	Lakeland	Drainage Improvements for City	Drainage	Area experience severe flooding for many years, exacerbated by continued growth in area. Feasibility study completed; Project will install positive outfall system to alleviate flooding/create more storage in lake	5,6,9	Flood	Both	Lakeland	$1,700,000	HMGP	12-18 Months	Deferred	Funding not available
Lakeland	Lakeland	Drainage Outfall Project	Drainage	Area experienced flooding over road and around homes. Project will provide outfall for drainage.	5,6,9	Flood	Both	Lakeland	$250,000	HMGP	12-18 Months	Deferred	Funding not available
Lakeland	Lakeland	Forestview Estates Drainage Project	Drainage	Growth along County Line area and in subdivision may have altered drainage patterns. Project consists of feasibility study, design, permitting and construction of positive outfall drainage system. Forestview Estates	5,6,9	Flood	Both	Lakeland	$200,000	HMGP	12-18 Months	Deferred	Funding not available
Lakeland	Lakeland	Fuel Storage Tank Acquisition	Infrastructure	Purchase and install two auxiliary fuel storage tanks to ensure adequate supply of fuel to city vehicles.	1,2,3	All	Existing	Lakeland	$75,000	HMGP	12-18 Months	Deferred	Funding not available
Lakeland	Lakeland	Generator Acquisition	Infrastructure	Generators are required at several key intersections to ensure safe traffic control.	1,2	All	Existing	Lakeland	$10,000	HMGP	12-18 Months	Deferred	Funding not available
Lakeland	Lakeland	Intersection Drainage Improvement	Drainage	Homes in high growth area around intersection subject to flooding. Project will implement findings of 1997 study.	5,6,9	Flood	Both	Lakeland	$900,000	HMGP	12-18 Months	Deferred	Funding not available
Lakeland	Lakeland	North Lakeland/Robson St Stormwater Improvements	Stormwater Improvement	Seven flood prone areas have been identified in this neighborhood and the master plan is complete. Funding would aid in design, property acquisition and construction of project. North Lakeland/Robson St	5,6,8,9	Flood	Both	Lakeland	$1,376,559	HMGP, FMA	12-18 Months	Completed	
Lakeland	Lakeland	Oakland Rd N Drainage Improvements	Drainage	Area experienced flooding in yards and roads. Project will establish drainage system along roadway. Oakland Road North	5,6,9	Flood	Both	Lakeland	$200,000	HMGP	12-18 Months	Deferred	Funding not available
Lakeland	Lakeland	Phase I and Phase II Drainage Studies	Drainage	Residences and roads flood during excessive rain. Phase I - feasibility study to improve drainage systems; Phase II construction, if feasible	5,6,9	Flood	Both	Lakeland	$540,000	HMGP	12-18 Months	Deferred	Funding not available
Lakeland	Lakeland	Phase I and Phase II Drainage Studies	Drainage	Growth in area and deterioration of system make it unable to handle runoff. Phase I - develop detailed master drainage plan; Phase II construction, if feasible	5,6,9	Flood	Both	Lakeland	$10,500,000	HMGP	12-18 Months	Deleted	Funding not available

Polk County LMS Update on Deferred, Completed, or Deleted Mitigation Project Initiatives
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Jurisdiction Benefitted	Jurisdiction (Location of Project)	Project Name	Project Type	Description	Mitigation Goal(s) Addressed	Hazard Mitigated*	Address New or Existing	Responsible Agency	Estimated Cost	Possible Funding Source(s)	Time to Complete	Deferred, Completed, or Deleted	If Deleted or Deferred, Why?
Lakeland	Lakeland	Phase I and Phase II Drainage Studies	Drainage	Area has experienced road flooding and was pumped. Phase I - feasibility study to determine if positive outfall possible: Phase II - construction, if feasible.	5,6,9	Flood	Both	Lakeland	$1,040,000	HMGP	12-18 Months	Deferred	Funding not available
Lakeland	Lakeland	Residential Area Drainage Improvement	Drainage	Area experienced flooding over road and around homes. Project will provide positive outfall	5,6,9	Flood	Both	Lakeland	$200,000	HMGP	12-18 Months	Deferred	Funding not available
Lakeland	Lakeland	Residential Drainage Improvement	Drainage	Flooding impacted home. Residents do not want to sell, but want to have flood issue resolved (Sanders)	5,6,9	Flood	Both	Lakeland	$250,000	HMGP	12-18 Months	Deleted	Funding not available
Lakeland	Lakeland	Sanitary Sewer System Inspection and Repair	Stormwater Improvement	Inspection and repair sanitary sewer system to prevent back flow of wastewater in the surface flooding after major rain events	1,8,9	Flood	Both	Lakeland	$476,000 -	HMGP, FMA	12-18 Months	Deferred	Funding not available
Lakeland	Lakeland	Wells Rd Drainage Improvements	Drainage	Regrading existing drainage ditches on Wells Rd., installing new drainage ditches and installing/replacing driveway culverts	5,6,9	Flood	Both	Lakeland	$250,000	HMGP	12-18 Months	Deleted	Funding not available
Lakeland	Lakeland	Window film on City Building Windows	Building Retrofit	Install window film on the windows of six selected mission essential buildings in the city to protect them from damage during storms.	1,2,10	Storms	Existing	Lakeland	$138,200	HMGP	12-18 Months	Deferred	Funding not available
Mulberry	Mulberry	Drainage & Stormwater Feasibility Study	Drainage	Area experienced flooding in yards due to inadequate drainage system. Project is a feasibility study to determine how to handle stormwater runoff.	5,6,9	Flood	Both	Mulberry	$50,000	HMGP	12-18 Months	Deferred	Ongoing project
Mulberry	Mulberry	Nw 10th Drive Drain System	Drainage	Street floods in heavy rains; some homes did flood, others were protected by sandbag barriers during hurricanes. Updated drain system will alleviate these flooding issues. NW 10th Dr.	5,6,9	Flood	Both	Mulberry	$1,000,000	HMGP, FMA	12-18 Months	Deferred	Ongoing project
City of Mulberry	City of Mulberry	Protective Measures - City Facilities	Infrastructure	rotective Measures - City Facilitie	1.4, 1.5	All	Both	Mulberry	$220,827.00	HMGP	12-18 Months	Deferred	Ongoing
Mulberry	Mulberry	NW 10th Drive Drainage Project	Drainage	Alleviate flooding of streets and homes along NW 10th Dr. (Mulberry)	1,9	Flood	Both	Mulberry Public Works	$600,000	SWFWMD, Stormwater Utility Fund	6-8 months	Deferred	Ongoing project
Mulberry	Mulberry	SW 5th Avenue Stabilization Project	Bank Stabilization	Stabilize the bank with gabions along SW 5th Ave. (Mulberry)	6,9	Flood	Both	Mulberry Public Works	$200,000	SWFWMD, Stormwater Utility Fund	6-8 months	Deferred	Ongoing project
Polk City	Polk City	Residential Flood Project (Peterson)	Drainage	Flooding impacted home. Residents do not want to sell, but want to have flood issue resolved (Peterson)	5,6,9	Flood	Both	Polk City	$250,000	HMGP	12-18 Months	Deleted	Project not recognized by City
Polk County	Polk County	Peace River Estates Acquisition	Land Acquisition	Purchase of home and property located in repetitively flooded area of Peace River Estates (Carr)	5,6,9	Flood	Existing	Polk Conty	$48,350	HMGP, FMA	12-18 Months	Deleted	Did not meet criteria for HMGP Funding
Auburndale	Auburndale	Ariana Boulevard Stormwater Installation	Drainage	Properties and Structures on Ariana Blvd. flooded from water flowing from Whistler Est. to Lake Ariana. Current drainage system cannot handle runoff. Project consists of design, permitting and construction of stormwater system	5,6,9	Flood	Both	Polk County	$200,000	HMGP	12-18 Months	Deferred	Project deferred for not meeting the HMGP B/C Ratio > 1.0
Polk County	Polk County	Drainage Feasibility Study	Drainage	Area experienced flooding in yards and roads due to inadequate drainage system. Project is a feasibility study to determine how to handle stormwater runoff.	5,6,9	Flood	Both	Polk County	$250,000	HMGP	12-18 Months	Deleted	Did not meet criteria for HMGP Funding
Auburndale	Auburndale	Moss Road/Jones Road Drainage Ditch Improvements	Drainage	Area experienced flooding in yards and roads. Project will re-establish drainage ditches. Moss Rd./Jones Rd.	5,6,9	Flood	Both	Polk County	$50,000	HMGP	12-18 Months	Completed	
Polk County	Polk County	Peace River Estates Acquisition	Land Acquisition	Purchase of home and property located in repetitively flooded area of Peace River Estates (McKenzie)	5,6,9	Flood	Existing	Polk County	$48,010	HMGP, FMA	12-18 Months	Completed	Project completed in 2006
Polk County	Polk County	Peace River Estates Acquisition	Land Acquistion	Purchase of home and property located in repetitively flooded area of Peace River Estates (Monroe)	5,6,9	Flood	Existing	Polk County	$70,640	HMGP, FMA	12-18 Months	Deleted	Did not meet criteria for HMGP Funding
Polk County	Polk County	Peace River Master Lift Station Project	Building Retrofit	Modify existing Master Lift Stations against flood waters from Peace River.	3,9	Flood	Existing	Polk County	$34,700	HMGP	12-18 Months	Deleted	No project records found.
Polk County	Polk County	Phase I and Phase II Dmainage Studies	Drainage	Yearly flooding a continual problem. Phase I - feasibility study, Phase II - construction, if feasible	5,6,9	Flood	Both	Polk County	$3,900,000	HMGP	12-18 Months	Deleted	Did not meet criteria for HMGP Funding

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Jurisdiction Benefitted	Jurisdiction (Location of Project)	Project Name	Project Type	Description	Mitigation Goal(s) Addressed	Hazard Mitigated*	Address New or Existing	Responsible Agency	Estimated Cost	Possible Funding Source(s)	Time to Complete	Deferred, Completed, or Deleted	If Deleted or Deferred, Why?
Polk County	Polk County	Phase I and Phase II Drainage Studies	Drainage	Stormwater system damaged during hurricanes and needs rehabilitation. Phase I - feasibility study; phase II - construction, if feasible.	5,6,9	Flood	Both	Polk County	$90,000	HMGP	12-18 Months	Deleted	Did not meet criteria for HMGP Funding
Polk County	Polk County	Point Discharge for retention pond to reduce neighborhood flooding	Drainage	Area experienced flooding in yards and roads. Project will establish point discharge from retention pond that overflows.	5,6,9	Flood	Both	Polk County	$120,000	HMGP	12-18 Months	Deleted	Did not meet criteria for HMGP Funding
Polk County	Polk County	SW Canal at Cherrywood Circle Pipe System Project	Drainage	During recent storms, area flooded and was pumped. Project will install pipe system to SW Canal at Cherrywood Circle	5,6,9	Flood	Both	Polk County	$75,000	HMGP	12-18 Months	Deleted	Did not meet criteria for HMGP Funding
Polk County	Polk County	Wildfire Mitigation	Vegitation Management	Increase defensable space between County conservation lands and neighboring homes and businesses.	5,6,9	Wildfire	Both	Polk County	$500,000	HMGP	12 months	Deferred	Budget Constraints
Polk County	Polk County	Window film on County Building Windows	Building Retrofit	Install protective window film on all first floor windows	1,2,10	Storms	Existing	Polk County	$22,000	HMGP	12-18 Months	Deleted	Not applicable for meeting standards
Polk County	Polk County	Central County Jail Auxilary Power	Infrastructure	Central County Jail Auxilary Power	3.4, 6.2, 6.3	All	Both	Polk County Facilities	$1,507,750.00	HMGP	12-18 Months	Deferred	Contract currently being contracted for approval
Polk County	Polk County	Fire/EMS Station Auxilary Power	Infrastructure	Fire/EMS Station Auxilary Power	3.4, 6.2, 6.3	All	Both	Polk County Facilities	$1,837,299.80	HMGP	12-18 Months	Deferred	Currently under review for HMGP Funding
Polk County	Polk County	Fire/EMS Station Protective Measures	Infrastructure	Fire/EMS Station Protective Measures	3.4, 6.2, 6.3	All	Both	Polk County Facilities	$1,730,432.00	HMGP	12-18 Months	Deferred	Budget Constraints
Polk County	Polk County	Fueling Facilities Auxilary Power	Infrastructure	Fueling Facilities Auxilary Power	2.2, 3.4, 6.3	All	Both	Polk County Facilities	$286,930.00	HMGP	12-18 Months	Deferred	Currently under review for HMGP Funding
Polk County	Polk County	New wind loaded overhead doors at EOC	Building Retrofit	Install 28 wind loaded overhead doors at compound.	1,2	Wind	Existing	Polk County Facilities Management	$252,000	HMGP	12-18 Months	Deleted	Not applicable anymore as we have built a new EOC.
Polk County	Polk County	Eloise Loop Road	Drainage	Eloise Loop Road	3.1, 5.1, 5.3	Flood	Both	Polk County Roads & Drainage	$285,782.00	HMGP	12-18 Months	Deferred	Currently under review for HMGP Funding
Polk County	Polk County	Jan Phyl Village	Drainage	Jan Phyl Village	3.1, 5.1, 5.3	Flood	Both	Polk County Roads & Drainage	$1,066,299.15	HMGP	12-18 Months	Deleted	Did not meet criteria for HMGP Funding
Polk County	Polk County	Wilson Acres	Drainage	Wilson Acres	3.1, 5.1, 5.3	Flood	Both	Polk County Roads & Drainage	$1,991,361.23	HMGP	12-18 Months	Deferred	Currently under review for HMGP Funding
Polk County	Polk County	Auxilary Power for 22 Liftstations	Infrastructure	Auxilary Power for 22 Liftstations	3.4, 6.2, 6.3	All	Both	Polk County Utilities	$2,043,475.00	HMGP	12-18 Months	Deferred	Pending funding from HMGP
Polk County	Polk County	Lift Station 5 Relocation Outside of Floodplain and Auxilary Power	Infrastructure	Lift Station 5 Relocation Outside of Floodplain and Auxilary Power	3.4, 4.2, 4.3, 5.1, 6.2, 6.3	Flood, All	Both	Polk County Utilities	$690,588.00	HMGP	12-18 Months	Deferred	Pending funding from HMGP
Polk State College	Polk State College	Wet and Dry Flood Proofing Systems for LAC Electrical Room	Infrastructure	Wet and Dry Flood Proofing Systems for LAC Electrical Room	2.5, 3.4, 5.1	Flood	Both	Polk State College	$85,836.00	HMGP	12-18 Months	Deferred	Ongoing Project
Polk County	Polk County	Establish NAVD 88 Benchmark Network	Floodplain Management	Establish NAVD 88 Benchmark network countywide as integral part of Map Modernization initiative	1,2,6,9	Flood	Both	SWFWMD, Polk County	$200,000	SWFWMD, County Funds	12-18 Months	Completed	Project completed in 2010.
Town of Dundee	Town of Dundee	Dundee Center St Drainage Imp	Drainage	Dundee Center St Drainage Imp	3.1, 5.1, 5.3	Flood	Both	Town of Dundee	$562,500.00	HMGP	12-18 Months	Deferred	Funding not available
Town of Dundee	Town of Dundee	Dundee Community Center Auxilary Power	Infrastructure	Dundee Riner WTF Safe Room	1.4, 2.5	All	Both	Town of Dundee	$56,650.00	HMGP	12-18 Months	Deferred	Funding not available
Town of Dundee	Town of Dundee	Dundee Community Center Protective Measures	Infrastructure	Dundee Community Center Protective Measures	1.4, 2.5	All	Both	Town of Dundee	$36,942.00	HMGP	12-18 Months	Deferred	Funding not available
Town of Dundee	Town of Dundee	Dundee Drainage Assessment/Improvements	Drainage	Dundee Drainage Assessment/Improvements	3.1, 5.1, 5.3	Flood	Both	Town of Dundee	$93,750.00	HMGP	12-18 Months	Deferred	Funding not available
Town of Dundee	Town of Dundee	Dundee Economy Lift Station	Infrastructure	Dundee Economy Lift Station	2.5, 6.2	All	Both	Town of Dundee	$125,000.00	HMGP	12-18 Months	Deferred	Funding not available
Town of Dundee	Town of Dundee	Dundee Fire Dept Protective Measures	Infrastructure	Dundee Fire Dept Protective Measures	1.4, 6.2, 6.3	All	Both	Town of Dundee	$27,800.00	HMGP	12-18 Months	Deferred	Funding not available
Town of Dundee	Town of Dundee	Dundee Fire Dept Wind Retrofit	Infrastructure	Dundee Fire Dept Wind Retrofit	1.4, 6.2, 6.3	All	Both	Town of Dundee	$37,500.00	HMGP	12-18 Months	Deferred	Funding not available
Town of Dundee	Town of Dundee	Dundee Fl Ave MLK Drainage Imp	Drainage	Dundee Fl Ave MLK Drainage Imp	3.1, 5.1, 5.3	Flood	Both	Town of Dundee	$562,500.00	HMGP	12-18 Months	Deferred	Funding not available
Town of Dundee	Town of Dundee	Dundee Lk Menzie Lk Marie Restroom PM	Infrastructure	Dundee Lk Menzie Lk Marie Restroom PM	1.4, 2.5	All	Both	Town of Dundee	$9,120.00	HMGP	12-18 Months	Deferred	Funding not available
Town of Dundee	Town of Dundee	Dundee Ridgewood Area Drainage Imp	Drainage	Dundee Ridgewood Area Drainage Imp	3.1, 5.1, 5.3	Flood	Both	Town of Dundee	$245,625.00	HMGP	12-18 Months	Deferred	Funding not available
Town of Dundee	Town of Dundee	Dundee Riner WTF Safe Room	Infrastructure	Dundee Riner WTF Safe Room	2.5, 6.2	All	Both	Town of Dundee	$19,375.00	HMGP	12-18 Months	Deferred	Funding not available
Polk County	Polk County	Install Generation Set at Landfill (Phase I)	Auxiliary Power	Phase I. Install a Generator Set. Pumping leachate out of the landfill for disposal at a wastewater treatment plant. Extended periods without electricity increases the risk of leachate leaking into the groundwater and causing contamination. (Disposal Facility Leachate Pumping Station)	1,8,10	Flood	Existing	Waste Resource Management	$29,000	HMGP	12-18 Months	Deferred	Budget Constraints

Polk County LMS Update on Deferred, Completed, or Deleted Mitigation Project Initiatives
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Jurisdiction Benefitted	Jurisdiction (Location of Project)	Project Name	Project Type	Description	Mitigation Goal(s) Addressed	Hazard Mitigated*	Address New or Existing	Responsible Agency	Estimated Cost	Possible Funding Source(s)	Time to Complete	Deferred, Completed, or Deleted	If Deleted or Deferred, Why?
Polk County	Polk County	Install Generation Set at Landfill (Phase II)	Auxiliary Power	Phase II. Install a Generator Set. Pumping leachate out of the landfill for disposal at a wastewater treatment plant. Extended periods without electricity increases the risk of leachate leaking into the groundwater and causing contamination. (Disposal Facility Leachate Pumping Station)	1,8,10	Flood	Existing	Waste Resource Management	$29,000	HMGP	12-18 Months	Deferred	Budget Constraints
Polk County	Polk County	Install Generation Set at Landfill (Phase III)	Auxiliary Power	Phase III. Install a Generator Set. Pumping leachate out of the landfill for disposal at a wastewater treatment plant. Extended periods without electricity increases the risk of leachate leaking into the groundwater and causing contamination. (Disposal Facility Leachate Pumping Station South)	1,8,10	Flood	Existing	Waste Resource Management	$35,000	HMGP	12-18 Months	Deferred	Budget Constraints
Polk County	Polk County	North Central Landfil Storage Building Replacement	Building Retrofit	Replace 4 portable storage sheds that store tools, equipment and supplies with a wind resistant permanent metal building at the North Central Landfill.	1,10	Wind, Storms	Existing	Waste Resource Management	$650,000	HMGP	12-18 Months	Deferred	Budget Constraints
Polk County	Polk County	Window film on County Building Windows	Building Retrofit	Install protective window film on windows of the WRMD office for protection from storm damage. (Winter Haven)	1,10	Storms	Existing	Waste Resource Management	$25,000	HMGP	12-18 Months	Deleted	Not applicable for meeting standards
City of Winter Haven	City of Winter Haven	By-Pass Pump for Wastewater Treatment Plant #2	Infrastructure	By-Pass Pump for Wastewater Treatment Plant #2	3.4, 6.2, 6.3	All	Both	Winter Haven	$82,713.40	HMGP	12-18 Months	Deferred	Funding not available
Winter Haven	Winter Haven	City Pipe System Replacement	Drainage	Area's pipe system has deteriorated, needs replacement	5,6,9	Flood	Both	Winter Haven	$1,100,000	HMGP	12-18 Months	Deferred	Funding not available
Winter Haven	Winter Haven	Drainage Improvements for Spanish Haven Subdivision	Drainage	Rework drainage system and construct additional components that will aid in collecting storm water runoff in Spanish Haven Subdivision. (94 residences)	5,6,9	Flood	Both	Winter Haven	$125,000	HMGP	12-18 Months	Completed	
City of Winter Haven	City of Winter Haven	Lift Station Generators	Infrastructure	Lift Station Generators	3.4, 6.2, 6.3	All	Both	Winter Haven	$210,848.00	HMGP	12-18 Months	Deferred	Funding not available
Winter Haven	Winter Haven	New City EOC/ROC and critical facility improvements (451 and 551 Third St NW	Critical Facilities	Create new city EOC/ROC in City Hall Annex during current renovations through some new design and some hardening of existing facility. 451 and 551 Third St NW	1,2,10	All	Existing	Winter Haven	$275,000	HMGP	12-18 Months	Deleted	Funding not available
Winter Haven	Winter Haven	Phase I and Phase II Drainage Studies	Drainage	During recent storms, area flooded and was pumped. Phase I - feasibility study to review flooding problem; Phase II - construction, if feasible	5,6,9	Flood	Both	Winter Haven	$540,000	HMGP	12-18 Months	Deleted	No record of project
Winter Haven	Winter Haven	Residential Property Purchase and Stormwater System Installation (Ave N SE and Fith St SE)	Land Acquisition, Drainage	Ten single family homes experience recurring flooding in most storm events. Proposal seeks to purchase one home and construct drainage and conveyance system. Ave N SE& Fifth St. SE	5,6,9	Flood	Both	Winter Haven	$390,000	HMGP, FMA	12-18 Months	completed	
Winter Haven	Winter Haven	Residential Stormwater Project (Pederson)	Drainage	Flooding impacted home. Residents do not want to sell, but want to have flood issue resolved(Patterson)	5,6,9	Flood	Both	Winter Haven	$250,000	HMGP	12-18 Months	Deleted	No record of project
Winter Haven	Winter Haven	Residential Stormwater Project (Platt)	Drainage	Flooding impacted home. Residents do not want to sell, but want to have flood issue resolved (Platt)	5,6,9	Flood	Both	Winter Haven	$250,000	HMGP	12-18 Months	Deleted	No record of project
Winter Haven	Winter Haven	Stormwater Improvements for Fox Briar Subdivision	Drainage	Rework drainage system and construct additional components that will aid in collecting storm water runoff at Fox Briar Subdivision . (108 residences)	5,6,9	Flood	Both	Winter Haven	$340,000	HMGP	12-18 Months	Completed	
Winter Haven	Winter Haven	Stormwater Pump Project	Drainage	Flooding in MHP caused water damage some outdoor utilities and water covered interior roads and Cypress Gardens Rd. Solution to pump water to nearby Fox Lake.	5,6,9	Flood	Both	Winter Haven	$250,000	HMGP	12-18 Months	Deleted	No record of project

ON-GOING PROJECT TABLE

Project	Polk County	Auburndale	Bartow	Davenport	Dundee	Eagle Lake	Fort Meade	Frostproof	Haines City	Highland Park	Hillcrest Heights	Lake Alfred	Lake Hamilton	Lake Wales	Lakeland	Mulberry	Polk City	Winter Haven	PCPS
Natural Hazards																			
Extreme Temperatures																			
Code requirements for landscape shading to reduce the urban heat island effect		X	X	X	X	X		X		X							X		
Fog																			
Encourage area news media to broadcast emergency information concerning fog that addresses safety precautions and/or the need to avoid certain travel corridors during a fog event																			
Hurricane/Tropical Storms																			
Adopt regulations governing residential construction to prevent wind damage.			X	X	X	X		X								X	X		
Promote or Require Site and Building Design Standards to Minimize Wind Damage			X	X	X			X		X						X			
Requirements to bury power lines to provide uninterrupted power after severe storms		X	X	X	X														
Severe Storms and Tornadoes (Hail, Lightning, and Thunderstorms)																			
Installing and maintaining surge protection on critical electronic equipment.			X	X	X	X	X				X					X			
Requiring tie-downs with anchors and ground anchors appropriate for the soil type for manufactured homes		X	X	X	X	X	X	X								X	X		
Sinkholes																			
Code requirements preventing and/or limiting development in soil-limited areas				X	X		X	X											
Drought																			
Require mandatory water conservation measures during drought emergencies		X	X	X	X		X	X			X						X		
Incorporating drought tolerant or xeriscape practices into landscape ordinances to reduce dependence on irrigation.			X	X			X	X									X		
Developing agreements for secondary water sources that may be used during drought conditions			X		X														
Flood																			
Enforcing adopted development requirements for development in wetlands and floodplains	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Adopting the International Building Code (IBC) and International Residential Code (IRC).		X			X	X	X	X		X									
Adding or increasing “freeboard” requirements (feet above base flood elevation) in the flood damage ordinance.		X		X	X		X										X		
Requiring a drainage study with new development			X	X			X												

Project	Polk County	Auburndale	Bartow	Davenport	Dundee	Eagle Lake	Fort Meade	Frostproof	Haines City	Highland Park	Hillcrest Heights	Lake Alfred	Lake Hamilton	Lake Wales	Lakeland	Mulberry	Polk City	Winter Haven	PCPS
Encouraging the use of Low Impact Development techniques		X		X													X		
Participate in the CRS	X											X			X				
Performing regular drainage system maintenance, such as sediment and debris clearance, as well as detection and prevention of discharges into stormwater and sewer systems from home footing drains, downspouts, or sewer pumps.			X	X	X	X	X	X									X		
Depending on its infrastructure capabilities, using check valves, sump pumps, and backflow prevention devices in homes and buildings.		X		X	X		X										X		
Wildfire																			
Hazardous Fuels Reduction				X			X												
Open burning regulations			X	X	X			X			X								
Required Radius of Defensible Space																			
Vegetation Management			X		X														
Addressing fire mitigation through access, signage, fire hydrants, water availability, vegetation management, and special building construction standards			X	X	X			X			X						X		
Firewise USA Community																			
Human Caused Hazards																			
Civil Disturbance/Terrorism																			
Hardening and/or increased security measures at places of public assembly – City Halls, etc			X	X	X			X									X		
Deputies at all public schools			X	X	X														
Cyber-Attacks																			
Increased security of systems including firewalls, back-up systems, etc		X	X	X	X			X			X						X		
Dam/Levee Failures																			
Epidemics																			
Implementation of social distancing measures				X	X		X	X		X	X						X		
Hazardous Materials Incidents																			
Citrus Health Response Program (CHRP) Assessment																			
Code of Ordinance requirements providing for regulation of the storage, handling, use or production of hazardous substances within zones of protection surrounding potable water supply wells				X	X		X				X						X		
Code of Ordinance requirements addressing the handling and discharge of hazardous waste			X	X	X			X			X						X		
Requirements for back flow preventers on wastewater or water systems			X	X	X		X										X		

Project	Polk County	Auburndale	Bartow	Davenport	Dundee	Eagle Lake	Fort Meade	Frostproof	Haines City	Highland Park	Hillcrest Heights	Lake Alfred	Lake Hamilton	Lake Wales	Lakeland	Mulberry	Polk City	Winter Haven	PCPS
Transportation Incidents																			
Adopted Complete Streets program	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Avon Park Air Force Range Training Notification on Polk County Property Appraiser parcel details for properties that may be affected by training activities																			
Routinely cleaning debris from support bracing underneath low-lying bridges.																			

Polk County 2020 Multi-Jurisdictional LMS Mitigation Action Plan - Mitigation Initiatives

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Jurisdiction Benefitted	Jurisdiction (Location of Project)	Project Name	Project Type	Description	Hazard Mitigated*	Address New or Existing	Responsible Agency	Responsible Department	Estimated Cost	Possible Funding Source(s)	Time to Complete
All	All	Public Education/Outreach	Education, Public Awareness	Ongoing mitigation initiative designed to mitigate the impact of various disasters by educating residential and commercial property owners of the hazards they face, vulnerability from hazards, and action s they can take to reduce the impacts of these hazards before they occur. Activities include participation in the National Weather Service Weather Ready Nation/Storm Ready program, partnerships with the Lakeland Flying Tigers minor league baseball team to host the annual Ready Night, use of social medial, and other outreach mechanisms.	All	Both	Polk County	County Public Safety Departments (Fire, EMS, E-911, etc)	$25,000	Public Safety Admin	Annual and Bi-annual
Auburndale	Auburndale	Highway 92, Lakeshore and Beach Lift Station Generator Project	Infrastructure	Highway 92, Lakeshore and Beach Lift Station Generator Project	All	Both	Auburndale	Public Works	$189,995.00	HMGP	12-18 Months
Auburndale	Auburndale	Alberta Street Drainage Improvement	Drainage	Relieves flooding and drainage problem at major intersection on Alberta St	Flood	Both	Auburndale	Public Works	$500,000	HMGP, FMA	12-18 Months
Bartow	Bartow	Fiber Smart Grid Pilot Project	New Infrastructure, Critical Facilities	Develop and Implement Smart Grid Pilot Project	All	New	Bartow	Public Works	$2,500,000.00	General Fund	24-36 Months
Bartow	Bartow	Fire Station #1	New Building, Critical Facilities	Construct New Fire Station to improve response time and serve new population	Fire, Flood	New	Bartow	Fire Department	$2,799,999.00	Fire Assessment Fee, General Fund	24-36 Months
Bartow	Bartow	Relocate Fire Station #0	New Building, Critical Facilities	Relocate Fire Station #1 to improve response time and serve new population	Fire, Flood	Both	Bartow	Fire Department	$3,499,999.00	Fire Assessment Fee, General Fund	24-36 Months
Davenport	Davenport	City Wide	Drainage	CDS Cleaning/Replacement of damaged inlets	Flood	Existing	Davenport	Public Works	$20,000.00	Stormwater	Annual
Davenport	Davenport	Critical Facility	Fire Department, Station- 1	Generator for comand center	Storm	Existing	Davenport		$50,000.00	FEMA-Grants	4-6 months
Davenport	Davenport	New Devlopment	Water Star Energy	Water Conservation incentives to Developers for using equipment. Incentives presented by SWFMD.	Water	New	Davenport	Building			Annual
Davenport	Davenport	Streets/Wind	Bucket Truck	Purchase a bucket truck for storm damage/storm mitigation	Wiind	New	Davenport	Streets	$245,000.00	FEMA-Grants	12-18 months
Davenport	Davenport	Critical Facility Wind Retrofit	Property Protection	Wind Retrofit to City Admin Builiding that houses Fire, Police and Public Works operations.	Wind	Existing	Davenport	Public Works	$160,000	HMGP	9-12 Months
Daveport	Davenport	City Hall/Building Department	Back-up Power	Installation of a Generator to run Ciy Hall, Commission Chamber, and Building Department	Wind/Storm	New	Davenport		$75,000.00	FEMA-Grants	4-6 months
Dundee	Dundee	Dundee Community Center Auxilary Power	Infrastructure	Dundee Community Center Auxilary Power	All	Both	Dundee	Public Works	$56,650.00	HMGP	12-18 Months
Dundee	Dundee	Dundee Community Center Protective Measures	Infrastructure	Dundee Community Center Protective Measures	All	Both	Dundee	Public Works	$36,942.00	HMGP	12-18 Months
Dundee	Dundee	Dundee Economy Lift Station	Infrastructure	Dundee Economy Lift Station	All	Both	Dundee	Public Works	$125,000.00	HMGP	12-18 Months
Dundee	Dundee	Dundee Fire Dept Protective Measures	Infrastructure	Dundee Fire Dept Protective Measures	All	Both	Dundee	Public Works	$27,800.00	HMGP	12-18 Months

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Dundee	Dundee	Dundee Fire Dept Wind Retrofit	Infrastructure	Dundee Fire Dept Wind Retrofit	All	Both	Dundee	Public Works	$37,500.00	HMGP	12-18 Months
Dundee	Dundee	Dundee Lk Menzie Lk Marie Restroom PM	Infrastructure	Dundee Lk Menzie Lk Marie Restroom PM	All	Both	Dundee	Public Works	$9,120.00	HMGP	12-18 Months
Dundee	Dundee	Dundee Riner WTF Safe Room	Infrastructure	Dundee Riner WTF Safe Room	All	Both	Dundee	Public Works	$19,375.00	HMGP	12-18 Months
Dundee	Dundee	Dundee Center St Drainage Imp	Drainage	Dundee Center St Drainage Imp	Flood	Both	Dundee	Public Works	$562,500.00	HMGP	12-18 Months
Dundee	Dundee	Dundee Drainage Assessment/Improvements	Drainage	Dundee Drainage Assessment/Improvements	Flood	Both	Dundee	Public Works	$93,750.00	HMGP	12-18 Months
Dundee	Dundee	Dundee Fl Ave MLK Drainage Imp	Drainage	Dundee Fl Ave MLK Drainage Imp	Flood	Both	Dundee	Public Works	$562,500.00	HMGP	12-18 Months
Dundee	Dundee	Dundee Ridgewood Area Drainage Imp	Drainage	Dundee Ridgewood Area Drainage Imp	Flood	Both	Dundee	Public Works	$245,625.00	HMGP	12-18 Months
Fort Meade	Fort Meade	Citywide	Stormwater Master Plan	A review of stormwater conditions throughout the City with recommendations for improvements.	Flooding	Both	Fort Meade and Southwest Florida Water Management District	Public Works, City Manager	160,000	City, Southwest Florida Water Management District	December 2020
Frostproof	City of Frostproof	Pressure Zoning	Drinking Water	Currently our system has no pressure zones, creating stagnant water in areas, extreme variation in pressures, brown and red water complaints coupled with air in lines.	Aesthetic, Health and Safety complaints	Existing	Frostproof	Utilities	$500,000.00	HMGP	12-24 Months
Frostproof	City of Frostproof	Hydrogen Peroxide system for Water Tretment Plant #5	Drinking Water	South water treatment plant #5 has elevated sulfides 2.5 time the average limit. This is causing excessive chlorine use of 9.6gph for only a 0.100mgd system	Disinfection by-products	Existing	Frostproof	Utilities	$50,000.00	HMGP	12-24 Months
Frostproof	Frostproof	Bass Property Purchase	Land Acquisition	Purchase of home and property damaged due to flooding (Bass)	Flood	Existing	Frostproof		$29,840	HMGP, FMA	12-18 Months
Frostproof	Frostproof	Johnston Property Purchase	Land Acquisition	Purchase of home and property damaged due to flooding (Johnston)	Flood	Existing	Frostproof		$53,510	HMGP, FMA	12-18 Months
Frostproof	Frostproof	Keen Park Road Drainage Project	Drainage	Area experienced flooding in yards and roads. Project will re-establish drainage ditches Keen Park Road	Flood	Both	Frostproof		$50,000	HMGP	12-18 Months
Frostproof	Frostproof	Magnolia Ave Stormwater Project	Drainage	Magnolia Ave. drainage, increase pipe diameter for proper stormwater run off (Frostproof)	Flood	Both	Frostproof Public Works		$100,000	FMA,HMGP,Captalization Grants for Clean Water State Revolving Funds, Nonpoint	12-18 Months
Frostproof	City of Frostproof	A street and SR 17 Drainage Project	Drainage	Localized street flooding backing up to SR17. Clean and vactor all storm pipes back to FDOT storm pond	Flooding	Existing	Frostproof	Public Works	$80,000.00	FMA, SWFWMD, FDOT	12-24 Months
Frostproof	City of Frostproof	Colony Ave StormDrainage Project	Drainage	Localized flooding at the intersection of Colony Ave and CR630 W.	Flooding	Existing	Frostproof	Public Works	$250,000.00	FMA, City of Frostproof, SWFWMD, Polk County	12-24 Months
Frostproof	City of Frostproof	Lake Ave and 3rd street Drainage Project	Drainage	Localized flooding of roadway	Flooding	Existing	Frostproof	Public Works	$100,000.00	FMA. HMGP. SWFWMD	12-24 Months

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Frostproof	City of Frostproof	Lake Clinch Outfalls Sedimentaion Removal	Drainage	Lake Clinch, Sedimaentaion blocking outfalls, not allowing proper drainage. Localized flooding areas.	Flooding	Exisiting	Frostproof	Public Works	$350,000.00	HMGP, FMA, SWFWMD	12-24 Months
Frostproof	City of Frostproof	Oak street and First Street Drainage Project	Drainage	Localized flooding streets, caused by heavy root intrusion into storm pipes. Remove roots and slip liine pipes	Flooding	Existing	Frostproof	Public Works	$235,000.00	FMA. HMGP. SWFWMD	12-24 Months
Frostproof	City of Frostproof	Street Sweeping	Streets	Sweeping from streets to maintain MS4 permit required cleaning	Flooding	Existing	Frostproof	Public Works	$15,000	FMA, HMGP, City	12-24 months
Frostproof	City of Frostproof	Sunset Road StormDrainage Project	Drainage	Localized Flooding at end of Sunset Road, causing flooding into homes	Flooding	Existing	Frostproof	Public Works	$300,000.00	HMGP, FMA, SWFWMD	12-24 Months
Frostproof	City of Frostproof	City Maintenance Shop Generator	Public Works	Currently our only Maintenance Shop has no auxilary power	Loss of Power	Exisitng	Frostproof	Public Works	$180,000.00	HMGP	12-24 Months
Frostproof	City of Frostproof	Main WTP Standby Generator	Drinking Water	Currently our Main WTP has no auxilary power supply	Loss of Water	Existing	Frostproof	Utilities	$280,000.00	HMGP	12-24 Months
Frostproof	City of Frostproof	Water Treatment Plant #7 CR630 to Hwy 27	Drinking Water	Finish installing High service pumps, chlorination station, well and maintenance building alleviating areas without safe drinking water	No water in existing and development areas	New and Existing	Frostproof	Utilities	$1,600,000.00	HMGP, DEO. CDBG, City of Frostproof	12-24 Months
Frostproof	City of Frostproof	D Street re-pump Lift-station Generator	Wastewater	Currently our re-pump lift-station has no auxilary power	Sanitary Sewer Overflow	Existing	Frostproof	Utilities	$200,000.00	HMGP	12-24 Months
Frostproof	City of Frostproof	Double Drive re-pump Lift station Generator	Wastewater	Currently our re-pump lift-station has no auxilary power	Sanitary Sewer Overflow	Existing	Frostproof	Utilities	$200,000.00	HMGP	12-24 Months
Frostproof	City of Frostproof	Headworks	Wastewater	Currently the City has no means of pre-limary treatment to remove rags/debri	Sanitary Sewer Overflow	Existing	Frostproof	Utilities	$750,000.00	HMGP, City	12-24 Months
Frostproof	City of Frostproof	Community Center Generator	Parks and Recreation	Currently our Leased Commuity center from Polk County has no back-up power. We could utilize this site as a Shelter or temporary quarters for essential personnel during hurricanes	Shelter	Exisitng	Frostproof	Parks and Rec	$200,000.00	HMGP	12-24 Months
Frostproof	Frostproof	City Hall Building Retrofit	Building Retrofit	Retrofit of critical facilities/window protection to City Hall (Frostproof)	Storms	Existing	Frostproof Public Works	Public Works	$150,000	HMGP, EMPA	12-18 Months
Frostproof	Frostproof	Fire/EMS Building Retrofit	Building Retrofit	Retrofit/harden Fire Dept/EMS station (Frostproof)	Storms	Existing	Frostproof Public Works	Fire Department	$150,000	HMGP, EMPA	12-18 Months
Golden Lakes Community Development District	Golden Lakes Community Development District	Eaglebrooke 2020 Stormwater Improvements	Drainage	Point Repairs and CIPP lining to correct existing storm system pipe issues and improve pipe flow.	Flood	Both	Golden Lakes Community Development District	Golden Lakes Community Development District	$532,000.00	CDD Assessments and Loan	6-12 Months
Golden Lakes Community Development District	Golden Lakes Community Development District	Eaglebrooke 2020 Stormwater System Cleaning and Inspection	Drainage	Condition assessment of remaining stormwater system. Clean and televise storm system that has not been previously inspected.	Flood	Both	Golden Lakes Community Development District	Golden Lakes Community Development District	$150,000.00	CDD Assessments and Loan	6-12 Months
Golden Lakes Community Development District	Golden Lakes Community Development District	Eaglebrooke North Pond A1	Drainage	Eaglebrooke North Pond A1	Flood	Both	Golden Lakes Community Development District	Golden Lakes Community Development District	$244,000	HMGP	12-18 Months
Haines City	Haines City	Grace Avenue and Robinson Drive Drainage	Drainage	Grace Avenue and Robinson Drive Drainage	Flood	Both	City of Haines City		$205,700.00	HMGP	12-18 Months

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Haines City	Haines City	Lift Station Improvements (18 Sun Air Blvd)	Building Retrofit	Due to low elevation, lift station floods and pump shorts out. Recommend raising lift station and replace current pump with submersible. 18 Sun Air Blvd. W	Flood	Existing	Haines City		$250,000	HMGP	12-18 Months
Haines City	Haines City	Phase I and Phase II Drainage Studies	Drainage	During recent storms, area flooded and was pumped. Phase I - feasibility study; Phase II - construction, if feasible.	Flood	Both	Haines City		$200,000	HMGP	12-18 Months
Lake Alfred	Lake Alfred	Master Wastewater Lift Station Upgrade	Infrastructure	Remove existing headworks no longer in use and upgrade electrical panels	All	Existing	City of Lake Alfred	Utilities	$150,000.00	Utility Reserves	6 months
Lake Alfred	Lake Alfred	Annual Preparations	Education, Public Awareness	Annual maintenance and repair of fire protection equipment including hoses, pump tests, equipment, and other gear.	All	Existing	City of Lake Alfred	Fire Department	$5,000.00	General Fund	Annual
Lake Alfred	Lake Alfred	Buena Vista Master Lift Station Upgrade	Infrastructure	Replacement of outdated canned style station to triplex wet well system to accommodate increased capacity needs and improve safety.	All	Both	City of Lake Alfred	Utilities	$650,000.00	SRF Loan	12-18 Months
Lake Alfred	Lake Alfred	Building inspections	Infrastructure	Inspection of all existing structural upgrades a, new buildings, change of occupancy, and other as need inspections such as fire, structural, electrical, plumbing, and safety.	All	Both	City of Lake Alfred	Community Development	$100,000.00	General Fund	Annual
Lake Alfred	Lake Alfred	Camera System	Infrastructure	Installation of a monitoring and recording system at various facilities and city buildings.	All	New	City of Lake Alfred	Public Works	$25,000.00	General Fund	6-12 months
Lake Alfred	Lake Alfred	CR 557 Sewer Extension	Infrastructure	Sanitary Sewer Main Line Extension along CR 557 north to CR 557A	All	New	City of Lake Alfred	Utilities	$1,500,000.00	SRF Loan	12-18 months
Lake Alfred	Lake Alfred	Elevated Water Storage Tank Demo	Infrastructure	Removal of elevated 65,000 gallon storage tank	All	Existing	City of Lake Alfred	Utilities	$150,000.00	Utility Reserves	3 months
Lake Alfred	Lake Alfred	Fire Engine Replacement	Infrastructure	Fire engine replacement program to include new equipment and ensure compliance with regulations.	All	Existing	City of Lake Alfred	Fire Department	$450,000.00	General Fund	10-year
Lake Alfred	Lake Alfred	Fire Prevention Programs	Education, Public Awareness	Community outreach and education program by the Fire Department to school, community organizations and HOA, retirement facilities regrading Fire Safety and Prevention.	All	Existing	City of Lake Alfred	Fire Department	$1,500.00	General Fund	Annual
Lake Alfred	Lake Alfred	Fire staff training	Education, Public Awareness	Continuing education for the Fire Department staff including, Storm Ready, Sky Warn, Fire, Disease, Health, Safety, and Fire prevention.	All	Existing	City of Lake Alfred	Fire Department	$5,000.00	General Fund	Annual
Lake Alfred	Lake Alfred	Fire Vehicles	Infrastructure	Fire vehicle replacement program to include new equipment and ensure compliance with regulations.	All	Existing	City of Lake Alfred	Fire Department	$150,000.00	General Fund	5-year
Lake Alfred	Lake Alfred	IT Maintenance	Infrastructure	On-going maintenance of IT systems.	All	Existing	City of Lake Alfred	Finance	$44,000.00	General Fund	Annual
Lake Alfred	Lake Alfred	IT Upgrades	Infrastructure	Equipment evaluations and upgrades including, replacement of the exchange server with the virtual server and equipment changes to thin client system.	All	Both	City of Lake Alfred	Finance	$250,000.00	General Fund	5-year
Lake Alfred	Lake Alfred	Lane repurpose	Infrastructure	The City is working with the FDOT to improve the safety along US 17/92 within the city-limits.	All	Existing	City of Lake Alfred	Streets	estimated $2 million	FDOT and City	10-years
Lake Alfred	Lake Alfred	Lift Station Generator	Infrastructure	Lift Station Generator	All	Both	City of Lake Alfred		$208,500.00	HMGP	12-18 Months

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Lake Alfred	Lake Alfred	Lift station repair and maintenance Program	Infrastructure	Program to repair or replace lift station pumps and panels to prevent sewage spillage or overflows.	All	Existing	City of Lake Alfred	Utilities	$75,000.00	Utility Fund	Annual
Lake Alfred	Lake Alfred	Phone system replacement	Infrastructure	Replacement of the existing phone network.	All	Existing	City of Lake Alfred	Finance	$100,000.00	General Fund	1-year
Lake Alfred	Lake Alfred	Police Department IT System Upgrade	Infrastructure	Equipment evaluations and upgrades to ensure communications with other public safety agencies on a secure network..	All	Existing	City of Lake Alfred	Police Department	$5,000.00	General Fund	Annul
Lake Alfred	Lake Alfred	Portable Communication Center	Infrastructure	Purchase of a mobile communications center (vehicle/trailer) to provide remote, secondary, or emergency communication support.	All	New	City of Lake Alfred	Police Department	$85,000.00	General Fund	5-year
Lake Alfred	Lake Alfred	Public Safety Complex Generator	Infrastructure	Public Safety Complex Generator	All	Both	City of Lake Alfred		$89,980.00	HMGP	12-18 Months
Lake Alfred	Lake Alfred	Public Safety Facility Repairs	Infrastructure	Repair and replacement of the windows and shutters on the Public Safety Facility (PD/Fire).	All	Existing	City of Lake Alfred	Public Works	$10,000.00	General Fund	6-12 months
Lake Alfred	Lake Alfred	Radio Upgrade	Infrastructure	Upgrade of all remote communication devices for all Public Safety and associated administrative staff.	All	Existing	City of Lake Alfred	Police Department	$160,000.00	General Fund	6-12 months
Lake Alfred	Lake Alfred	Railroad crossing upgrades	Infrastructure	Program to repair and upgrade all of the railroad crossings within the city-limits. Three crossings will be repaired and paved. Five crossings will be repaired and upgraded to concrete crossings.	All	Existing	City of Lake Alfred	Streets	$100,000.00	CSX and City General Fund	2-years
Lake Alfred	Lake Alfred	ROW maintenance	Transportation	Maintenance of ROW, maintaining capacity and access through maintenance of infrastructure and landscaping	All	Existing	City of Lake Alfred	Streets	$20,000.00	General Fund	Annual
Lake Alfred	Lake Alfred	Safety Training	Education, Public Awareness	In-house training - Safety and like pipes	All	Existing	City of Lake Alfred	Utilities	$5,000.00	Utility Fund	Annual
Lake Alfred	Lake Alfred	Sidewalk Program	Transportation	Maintenance of sidewalk infrastructure by evaluating the existing sidewalks for repair, replacement, and ADA improvements. Extensions and expansions of the sidewalk network based on the Parks Master Plan.	All	Existing	City of Lake Alfred	Streets	$50,000.00	General Fund	Annual
Lake Alfred	Lake Alfred	Street Light Project	Infrastructure	Program to evaluate and identify streets needing installation of street lighting. The first project area is Mackay Blvd.	All	Existing	City of Lake Alfred	Streets	$250,000.00	Grants, Lighting District, and General Fund	5-year
Lake Alfred	Lake Alfred	Street Resurfacing	Infrastructure	Program to evaluate and identify streets needing repairs and resurfacing. The program involves a two year cycle of evaluation and then paving of priority projects.	All	Existing	City of Lake Alfred	Streets	$200,000.00	Gas Tax	biannual
Lake Alfred	Lake Alfred	Street Sign Preplacement Program	Infrastructure	Program to inventory, evaluate and replace street signs through out City with high visibility signs for safety and evacuation purposes.	All	Existing	City of Lake Alfred	Streets	$50,000.00	General Fund	5-year
Lake Alfred	Lake Alfred	Utility line replacement	Infrastructure	Program to replace or repair existing water or wastewater utility lines.	All	Existing	City of Lake Alfred	Utilities	$50,000.00	Utility Fund	Annual
Lake Alfred	Lake Alfred	Wastewater Repair and Maintenance Program	Infrastructure	Program to repair or replace wastewater equipment to ensure proper wastewater processing and treatment.	All	Existing	City of Lake Alfred	Utilities	$70,000.00	Utility Fund	Annual
Lake Alfred	Lake Alfred	Water and Wastewater Vulnerability	Infrastructure		All	Existing	City of Lake Alfred	Utilities		Utility Fund	

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Lake Alfred	Lake Alfred	Water Conservation Program	Infrastructure	Program to evaluate water conservation methods that can reduce water waste. Plan , implement, and educate the public on the various techniques. When possible incentivize or provide tools for program implementation.	All	Existing	City of Lake Alfred	Utilities	$20,000.00	Utilities	Annual
Lake Alfred	Lake Alfred	Water plant repair and maintenance Program	Infrastructure	Program to repair or replace equipment to operate water treatment facility..	All	Existing	City of Lake Alfred	Utilities	$30,000.00	Utility Fund	Annual
Lake Alfred	Lake Alfred	Water Quality Testing	Infrastructure		All	Existing	City of Lake Alfred	Utilities		Utility Fund	Annual
Lake Alfred	Lake Alfred	Flood evaluations improvement program	Infrastructure	Monitoring program to evaluate localized flooding issues and propose corrective measures	Hurricanes, Climate change, Flooding, Severe Storms	Existing	City of Lake Alfred	Streets	$50,000.00	Storm water Fund	5-year
Lake Alfred	Lake Alfred	Storm grate replacements program	Infrastructure	Program to inventory, evaluate and replace or repair storm grate inlets through out City.	Hurricanes, Climate change, Flooding, Severe Storms	Existing	City of Lake Alfred	Utilities	$50,000.00	General Fund	5-year
Lake Alfred	Lake Alfred	Storm ready	Education, Public Awareness	Community preparedness program to prepare for severe storms.	Hurricanes, Climate change, Flooding, Severe Storms	Existing	City of Lake Alfred	Fire Department	-	General Fund	Annual
Lake Alfred	Lake Alfred	Storm water Education Program	Education, Public Awareness	Annual storm water training for City staff and the public.	Hurricanes, Climate change, Flooding, Severe Storms	Existing	City of Lake Alfred	Utilities	-	Storm water Fund	Annual
Lake Alfred	Lake Alfred	Storm water Monitoring	Infrastructure	Monitoring program to evaluate the volumes and water quality at various location in the City.	Hurricanes, Climate change, Flooding, Severe Storms	Existing	City of Lake Alfred	Streets	$1,500.00	Storm water Fund	Annual
Lake Alfred	Lake Alfred	Street Sweeping	Maintenance	Monthly sweeping of streets throughout the City to prevent contaminates from reaching the storm water system.	Hurricanes, Climate change, Flooding, Severe Storms	Both	City of Lake Alfred	Storm water	$20,000.00	General Fund	Annual
Lake Alfred	Lake Alfred	Hurricane Expo	Education, Public Awareness	Flood safety/ CRS	Hurricanes, Flooding, Severe Storms	Both	City of Lake Alfred	Community Development		Building Funds	Annual
Lake Hamilton	Lake Hamilton	CDBG Stormwater Improvement for Marye Jayne Heights	Drainage	Project includes infrastruction improvements to benefit low and mdoerate income persons living in the effected area. Project includes design, property acquisition and construction of project	flooding	both	Town of Lake Hamilton	Public Works	$670,000	DEO Grant/Local match	Winter 2020
Lake Hamilton	Lake Hamilton	Upgrade Town Hall		The historic school house, which has been used as Town Hall required an update due to black mold and limited space condiditions. The project will also build a new police department to adress safety	Hazardous Materials	both	Town of Lake Hamilton	All	1.5 Million	Commercial Loan	Spring 2020
Lake Hamilton	Lake Hamilton	Water Distribution System Upgrade	Infrastructure	The of Lake Hamilton will be replacing water lines in many areas of the service area of the municipal uitility. The project will create loops and eliminate shutting water down for the entire town.	Hazardous Materials	Both	Town of Lake Hamilton	Public Works	4.2 million	USDA Grant/Loan	Spring 2021
Lake Hamilton	Lake Hamilton	Road enhancment	Transportation/infrastruture	Project includes infrastruction improvements to all the roads in Lake Hamilton, to include adding stormdrains, sidewalks, paving.	transportation incidents	both	Town of Lake Hamilton	Public Works	unknown	grants, loans, assessments, gas tax revenue	on going
Lake Region Lakes Management District	Lake Region Lakes Management District	Wahneta Drainage Improvement	Land Acquisition, Drainage	Wahneta Drainage Improvement	Flood	Both	Lake Region Lakes Management District	Lake Region Lakes Management District	$2,000,000.00	HMGP	12-18 Months
Lake Wales	Lake Wales	City Administration Building Retrofit	Building Retrofit	Lake Wales plans to retrofit city admin building, LWPD HQ, LWFD/EOC, Austin Center upgrade roof and add shutters	Storms	Existing	Lake Wales		$750,000	HMGP	12-18 Months
Lakeland	Lakeland	Fuel Storage Tank Acquisition	Infrastructure	Purchase and install two auxiliary fuel storage tanks to ensure adequate supply of fuel to city vehicles.	All	Existing	Lakeland		$75,000	HMGP	12-18 Months

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Lakeland	Lakeland	Generator Acquisition	Infrastructure	Generators are required at several key intersections to ensure safe traffic control.	All	Existing	Lakeland		$10,000	HMGP	12-18 Months
Lakeland	Lakeland	DARTS	Capture Damage Assessment, Data Collection, & FEMA Reimbursement	Utilized ESRI applications "Collector" and "Survey 123" in conjunction with internal dashboards to create an easy to use mobile solution for all facets of damage assessment and data collection to include FEMA reimbursement information	Damage Assessment of Lakeland Electric customers	N/A	Lakeland	LE	$13,500.00	Local/State	ongoing
Lakeland	Lakeland	Cardinal St/Robin St Drainage Improvements	Drainage	Outfall in area is inefficient. Design, permit and construct efficient outfall. Cardinal St./Robin St	Flood	Both	Lakeland		$75,000	HMGP	12-18 Months
Lakeland	Lakeland	Drainage Improvement in Residential Areas	Drainage	Residences and roads flood during excessive rain. Project consists of providing positive outfall for drainage.	Flood	Both	Lakeland		$1,000,000	HMGP	12-18 Months
Lakeland	Lakeland	Drainage Improvements for City	Drainage	Area experience severe flooding for many years, exacerbated by continued growth in area. Feasibility study completed; Project will install positive outfall system to alleviate flooding/create more storage in lake	Flood	Both	Lakeland		$1,700,000	HMGP	12-18 Months
Lakeland	Lakeland	Drainage Outfall Project	Drainage	Area experienced flooding over road and around homes. Project will provide outfall for drainage.	Flood	Both	Lakeland		$250,000	HMGP	12-18 Months
Lakeland	Lakeland	Forestview Estates Drainage Project	Drainage	Growth along County Line area and in subdivision may have altered drainage patterns. Project consists of feasibility study, design, permitting and construction of positive outfall drainage system. Forestview Estates	Flood	Both	Lakeland		$200,000	HMGP	12-18 Months
Lakeland	Lakeland	Intersection Drainage Improvement	Drainage	Homes in high growth area around intersection subject to flooding. Project will implement findings of 1997 study.	Flood	Both	Lakeland		$900,000	HMGP	12-18 Months
Lakeland	Lakeland	Phase I and Phase II Drainage Studies	Drainage	Residences and roads flood during excessive rain. Phase I - feasibility study to improve drainage systems; Phase II construction, if feasible	Flood	Both	Lakeland		$540,000	HMGP	12-18 Months
Lakeland	Lakeland	Sanitary Sewer System Inspection and Repair	Stormwater Improvement	Inspection and repair sanitary sewer system to prevent back flow of wastewater in the surface flooding after major rain events	Flood	Both	Lakeland		$476,000 -	HMGP, FMA	12-18 Months
Lakeland	Lakeland	Generator installation for sewage lift stations	Wastewater	Install new emergency generators or diesel bypass pumps at lift stations that do not have emergency backup equioment	Sanitary Sewer overflows	Both	Lakeland		$200,000	Watstewater	12-18 Months
Lakeland	Lakeland	Sanitary Sewer System Inspection and Repair	Wastewater	Inspection and repair sanitary sewer system to prevent back flow of wastewater after major rain events	Sanitary sewer Overflows	Both	Lakeland		$1,500,000	Wastewater	12-18 Months
Lakeland	Lakeland	Window film on City Building Windows	Building Retrofit	Install window film on the windows of six selected mission essential buildings in the city to protect them from damage during storms.	Storms	Existing	Lakeland		$138,200	HMGP	12-18 Months

Polk County 2020 Multi-Jurisdictional LMS Mitigation Action Plan - Mitigation Initiatives

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Jurisdiction Benefitted	Jurisdiction (Location of Project)	Project Name	Project Type	Description	Hazard Mitigated*	Address New or Existing	Responsible Agency	Responsible Department	Estimated Cost	Possible Funding Source(s)	Time to Complete
Lakeland	Lakeland	Traffic Management Center (TMC) - 100% redundant interconnected traffic signal fiber system.	Operation & Maintenance of City-wide Traffic Signal Control System	In part, with the utilization of 90 CCTV cameras for live fully remote/integrated, monitoring and the Regional Integrated Transportation Information System, (RITIS) along these corridors, our division monitors real-time traffic conditions and collects travel times in real-time. FDOT District 1 provides resources and works with the City of Lakeland's T.M.C. staff to implement signal timing changes to enhance traffic flow and reduce motorist delay. Also, FDOT District 7's Sun Guide Center in Tampa, Florida Turnpike Center in Turkey Lake, and the City of Lakeland T.M.C. work together through the Traffic Incident Management (T.I.M.) Team to improve interstate-arterial coordination during incidents on I-4 and the Polk Parkway through Lakeland. The hours of operation are Monday through Friday 7AM to 7PM.	Traffic signal CCTV surveillance and crash mitigation, response and reduction of motorists' delay.	Both	Lakeland	Traffic Ops	$750,000.00	Local/State FDOT	ongoing
Lakeland	Lakeland	Pilot Project: Intersection Collision Avoidance Safety Program (iCASP)	Preventing Red Light Running Crashes	The City is implementing an Intersection Collision Avoidance Safety Program or iCASP. iCASP is designed to effectively predict red light running motorists and then extend the "All-Red" signal phase (perpendicular green light will be delayed) to avoid intersection crashes. This program is in conjunction with the City of Lakeland Police Department (LPD) red-light running safety program.	Vehicle Crashes	Both	Lakeland	Traffic Ops	$75,000.00	Local/State FDOT	12-24 Months
Mulberry	Mulberry	Protective Measures - City Facilities	Infrastructure	Protective Measures - City Facilities	All	Both	Mulberry	Public Works	$220,827.00	HMGP	12-18 Months
Mulberry	Mulberry	Drainage & Stormwater Feasibility Study	Drainage	Area experienced flooding in yards due to inadequate drainage system. Project is a feasibility study to determine how to handle stormwater runoff.	Flood	Both	Mulberry	Public Works	$50,000	HMGP	12-18 Months
Mulberry	Mulberry	Nw 10th Drive Drain System	Drainage	Street floods in heavy rains; some homes did flood, others were protected by sandbag barriers during hurricanes. Updated drain system will alleviate these flooding issues. NW 10th Dr.	Flood	Both	Mulberry	Public Works	$1,000,000	HMGP, FMA	12-18 Months
Mulberry	Mulberry	NW 10th Drive Drainage Project	Drainage	Alleviate flooding of streets and homes along NW 10th Dr. (Mulberry)	Flood	Both	Mulberry	Public Works	$600,000	SWFWMD, Stormwater Utility Fund	6-8 months
Mulberry	Mulberry	SW 5th Avenue Stabilization Project	Bank Stabilization	Stabilize the bank with gabions along SW 5th Ave. (Mulberry)	Flood	Both	Mulberry	Public Works	$200,000	SWFWMD, Stormwater Utility Fund	6-8 months
Polk County	Polk County	Auxilary Power for 22 Liftstations	Infrastructure	Auxilary Power for 22 Liftstations	All	Both	Polk County	Utilities	$2,043,475.00	HMGP	12-18 Months
Polk County	Polk County	Central County Jail Auxilary Power	Infrastructure	Central County Jail Auxilary Power	All	Both	Polk County	Facilities Management	$1,507,750.00	HMGP	12-18 Months
Polk County	Polk County	Eloise Resource Center	Infrastructure	Wind impact protection for all windows -review doors and storefront glass for impact resistance and replace where needed.	All	Both	Polk County	Facilities Management	$116,250	HMGP	12-18 Months
Polk County	Polk County	Fire/EMS Station Auxilary Power	Infrastructure	Fire/EMS Station Auxilary Power	All	Both	Polk County	Facilities Management	$1,837,299.80	HMGP	12-18 Months
Polk County	Polk County	Fire/EMS Station Protective Measures	Infrastructure	Fire/EMS Station Protective Measures	All	Both	Polk County	Facilities Management	$1,730,432.00	HMGP	12-18 Months
Polk County	Polk County	Fueling Facilities Auxilary Power	Infrastructure	Fueling Facilities Auxilary Power	All	Both	Polk County	Facilities Management	$286,930.00	HMGP	12-18 Months

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Jurisdiction Benefitted	Jurisdiction (Location of Project)	Project Name	Project Type	Description	Hazard Mitigated*	Address New or Existing	Responsible Agency	Responsible Department	Estimated Cost	Possible Funding Source(s)	Time to Complete
Polk County	Polk County	W.H Conference Stuart Center	Infrastructure	Wind impact protection for all windows -review doors and storefront glass for impact resistance and replace where needed.	All	Both	Polk County	Facilities Management	$20,200	HMGP	12-18 Months
Polk County	Auburndale	Ariana Boulevard Stormwater Installation	Drainage	Properties and Structures on Ariana Blvd. flooded from water flowing from Whistler Est. to Lake Ariana. Current drainage system cannot handle runoff. Project consists of design, permitting and construction of stormwater system	Flood	Both	Polk County	Roads & Drainage	$200,000	HMGP, Property Tax	12-18 Months
Polk County	Polk County	Bridgers Avenue Drainage Improvements	Drainage	Improve existing drainage system to prevent flooding of streets, property and homes	Flood	Existing	Polk County	Roads & Drainage	$2,600,000	HMGP, Property Tax	12-18 Months
Polk County	Polk County	Collier Drive/Alachua Drive Drainage Improvements	Drainage	Improve existing drainage system to prevent flooding of streets, property and homes	Flood	Existing	Polk County	Roads & Drainage	$700,000	HMGP, Property Tax	12-18 Months
Polk County	Polk County	Eloise Loop Road	Drainage	Eloise Loop Road	Flood	Both	Polk County	Roads & Drainage	$285,782.00	HMGP	12-18 Months
Polk County	Polk County	Griffin Ave Drainage Improvements	Drainage	Improve existing drainage system to prevent flooding of streets, property and homes	Flood	Existing	Polk County	Roads & Drainage	$210,000	HMGP, Property Tax	12-18 Months
Polk County	Polk County	Heather Heights/Kristina Court Drainage Improvements	Drainage	Improve existing drainage system to prevent flooding of streets, property and homes	Flood	Existing	Polk County	Roads & Drainage	$600,000	HMGP, Property Tax	12-18 Months
Polk County	Polk County	Install Generation Set at Landfill (Phase I)	Auxiliary Power	Phase I. Install a Generator Set. Pumping leachate out of the landfill for disposal at a wastewater treatment plant. Extended periods without electricity increases the risk of leachate leaking into the groundwater and causing contamination. (Disposal Facility Leachate Pumping Station)	Flood	Existing	Polk County	Waste & Recycling	$29,000	HMGP	12-18 Months
Polk County	Polk County	Install Generation Set at Landfill (Phase II)	Auxiliary Power	Phase II. Install a Generator Set. Pumping leachate out of the landfill for disposal at a wastewater treatment plant. Extended periods without electricity increases the risk of leachate leaking into the groundwater and causing contamination. (Disposal Facility Leachate Pumping Station)	Flood	Existing	Polk County	Waste & Recycling	$29,000	HMGP	12-18 Months
Polk County	Polk County	Install Generation Set at Landfill (Phase III)	Auxiliary Power	Phase III. Install a Generator Set. Pumping leachate out of the landfill for disposal at a wastewater treatment plant. Extended periods without electricity increases the risk of leachate leaking into the groundwater and causing contamination. (Disposal Facility Leachate Pumping Station South)	Flood	Existing	Polk County	Waste & Recycling	$35,000	HMGP	12-18 Months
Polk County	Polk County	Install Generator Set at Landfill (Phase V)	Auxiliary Power	Phase V. Install a Generator Set. Pumping leachate out of the landfill for disposal at a wastewater treatment plant. Extended periods without electricity increases the risk of leachate leaking into the groundwater and causing contamination. (Disposal Facility Leachate Pumping Station)	Flood	Existing	Polk County	Waste & Recycling	$45,000	HMGP	12-18 Months
Polk County	Polk County	Install Generator Set at Landfill (Phase VI)	Auxiliary Power	Phase VI. Install a Generator Set. Pumping leachate out of the landfill for disposal at a wastewater treatment plant. Extended periods without electricity increases the risk of leachate leaking into the groundwater and causing contamination. (Disposal Facility Leachate Pumping Station)	Flood	proposed (2020)	Polk County	Waste & Recycling	$45,000	HMGP	12-18 Months
Polk County	Polk County	Keen Park Road Drainage Project	Drainage	Area experienced flooding in yards and roads. Project will re-establish drainage ditches Keen Park Road	Flood	Both	Polk County	Roads & Drainage	$50,000	HMGP, Property Tax	12-18 Months
Polk County	Polk County	Keith Lane Drainage Improvements	Drainage	Improve existing drainage system to prevent flooding of streets, property and homes	Flood	Existing	Polk County	Roads & Drainage	$560,000	HMGP, Property Tax	12-18 Months

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Jurisdiction Benefitted	Jurisdiction (Location of Project)	Project Name	Project Type	Description	Hazard Mitigated*	Address New or Existing	Responsible Agency	Responsible Department	Estimated Cost	Possible Funding Source(s)	Time to Complete
Polk County	Polk County	Lake Parker Regional Drainage System Phase IV	Drainage	Provide slope stabilization to prevent further erosion of drainage system.	Flood	Existing	Polk County	Roads & Drainage	$720,000	HMGP, Property Tax	12-18 Months
Polk County	Polk County	Moss Road/Jones Road Drainage Ditch Improvements	Drainage	Area experienced flooding in yards and roads. Project will re-establish drainage ditches. Moss Rd./Jones Rd.	Flood	Both	Polk County	Roads & Drainage	$50,000	HMGP, Property Tax	12-18 Months
Polk County	Polk County	Oakland Rd N Drainage Improvements	Drainage	Area experienced flooding in yards and roads. Project will establish drainage system along roadway. Oakland Road North	Flood	Both	Polk County	Roads & Drainage	$200,000	HMGP, Property Tax	12-18 Months
Polk County	Polk County	Rolling Oaks Drainage Improvements	Drainage	Improve existing drainage system to prevent flooding of streets, property and homes	Flood	Existing	Polk County	Roads & Drainage	$800,000	HMGP, Property Tax	12-18 Months
Polk County	Polk County	Silver Sands Drainage Improvements	Drainage	Improve existing drainage system to prevent flooding of streets, property and homes	Flood	Existing	Polk County	Roads & Drainage	$600,000	HMGP, Property Tax	12-18 Months
Polk County	Polk County	South Carter Road Drainage Improvements	Drainage	Improve existing drainage system to prevent flooding of streets, property and homes	Flood	Existing	Polk County	Roads & Drainage	$2,000,000	HMGP, Property Tax	12-18 Months
Polk County	Polk County	Sunset Trail SW Water Quality / Drainage Improvements	Drainage	Improve existing drainage system to prevent flooding of streets, property and homes	Flood	Existing	Polk County	Roads & Drainage	$1,000,000	HMGP, Property Tax	12-18 Months
Polk County	Polk County	SW Canal at Cherrywood Circle Pipe System Project	Drainage	During recent storms, area flooded and was pumped. Project will install pipe system to SW Canal at Cherrywood Circle	Flood	Both	Polk County	Roads & Drainage	$75,000	HMGP	12-18 Months
Polk County	Polk County	Tillery/Clubhouse Road Drainage Improvements	Drainage	Improve existing drainage system to prevent flooding of streets, property and homes	Flood	Existing	Polk County	Roads & Drainage	$500,000	HMGP, Property Tax	12-18 Months
Polk County	Polk County	West Lake Eloise Drive Drainage Improvements	Drainage	Raise road to prevent flooding of roadway	Flood	Existing	Polk County	Roads & Drainage	$1,100,000	HMGP, Property Tax	12-18 Months
Polk County	Polk County	Wildwood Subdivision Drainage Improvements	Drainage	Improve existing drainage system to prevent flooding of streets, property and homes	Flood	Existing	Polk County	Roads & Drainage	$600,000	HMGP, Property Tax	12-18 Months
Polk County	Polk County	Wilson Acres	Drainage	Wilson Acres	Flood	Both	Polk County	Roads & Drainage	$1,991,361.23	HMGP	12-18 Months
Polk County	Polk County	Lift Station 5 Relocation Outside of Floodplain and Auxilary Power	Infrastructure	Lift Station 5 Relocation Outside of Floodplain and Auxilary Power	Flood, All	Both	Polk County	Utilities	$690,588.00	HMGP	12-18 Months
Polk County	Polk County	Bridge Rehabilitation	Maintenance	Maintain Bridges	Storms	Existing	Polk County	Roads & Drainage	$740,000.00	Taxes	Annually
Polk County	Polk County	Culvert Failure Contingency	Maintenance	Repair and Replace Culverts and associated Drainage Systems	Storms	Existing	Polk County	Roads & Drainage	$2,500,000.00	Property Taxes	Annually
Polk County	Polk County	Maitenance of Stormwater Facilities	Maintenance	Maintain existing Stormwater Facilities (Ponds/Ditches)	Storms	Existing	Polk County	Roads & Drainage	$500,000.00	Property Taxes	Annually
Polk County	Polk County	Pavement Management	Maintenance	Maintain our Pavement Surfaces on Roadways	Storms	Existing	Polk County	Roads & Drainage	$18,000,000.00	Taxes	Annually

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Jurisdiction Benefitted	Jurisdiction (Location of Project)	Project Name	Project Type	Description	Hazard Mitigated*	Address New or Existing	Responsible Agency	Responsible Department	Estimated Cost	Possible Funding Source(s)	Time to Complete
Polk County	Polk County	Garden Grove Drainage Improvements	Drainage	Improve existing drainage system to prevent flooding of streets, property and homes	Storms/Flood	Existing	Polk County	Roads & Drainage	$2,200,000	HMGP, Property Tax	12-18 Months
Polk County	Polk County	Wildfire Mitigation	Vegetation Management	Increase defensable space between County conservation lands and neighboring homes and businesses.	Wildfire	Both	Polk County	Parks and Natural Resources	$500,000	HMGP	12 months
Polk County	Polk County	North Central Landfil Storage Building Replacement	Building Retrofit	Replace 4 portable storage sheds that store tools, equipment and supplies with a wind resistant permanent metal building at the North Central Landfill.	Wind, Storms	Existing	Polk County	Waste & Recycling	$650,000	HMGP	12-18 Months
Polk County School Board	Elbert Elementary 205 15th Street NE Winter Haven, FL 33881	Elbert Elementary Install retaining wall	Property Protection	Install retaining wall to prevent erosion from to hinder stormwater runoff from city streets	Flooding	Existing	School Board	Facilities	$50,000		1 year
Polk County School Board	Lake Alfred Elementary 550 E Cummings Lake Alfred, FL 33850	Lake Alfred Elementary Improve drainage from Blds 1, 2, & 3 to playground	Property Protection	Bring gutter/downspouts from buildings and tie into stormwater system	Flooding	Existing	School Board	Facilities	$75,000		1 year
Polk County School Board	Lake Alfred Polytech 925 N Buena Vista Dr Lake Alfred, FL 33850	Lake Alfred Polytech Install gutters	Property Protection	Install gutters to improve drainage and reduce erosion	Flooding	Existing	School Board	Facilities	$48,000		1 year
Polk County School Board	R. Bruce Wagner Elem. 5500 Yates Road Lakeland, FL 33811	R. Bruce Wagner Elem. Install gutters	Property Protection	Install gutters to improve drainage and reduce erosion	Flooding	Existing	School Board	Facilities	$100,000		1 year
Polk County School Board	Sleepy Hill Middle 2215 Sleepy Hill Road Lakeland, FL 33809	Sleepy Hill Middle Install gutters	Property Protection	Install gutters to improve drainage and reduce erosion	Flooding	Existing	School Board	Facilities	$140,000		1 year
Polk County School Board	Jewett School of the Arts 2250 8th Street Winter Haven, FL 33881	Jewett School of the Arts Improve flat/ballasted roofs to metal Blds 1, 2	Property Protection	Rertrofit flat and ballasted roof systems to reduce future wind and water damage	Hurricanes & Tropical Storms	Existing	School Board	Facilities	$2,071,403		1 year
Polk County School Board	Lake Alfred Elementary 550 E Cummings Lake Alfred, FL 33850	Lake Alfred Elementary Improve flat/ballasted roofs to metal Blds 1, 2, 3, 4, 5,7, 8, 9	Property Protection	Rertrofit flat and ballasted roof systems to reduce future wind and water damage	Hurricanes & Tropical Storms	Existing	School Board	Facilities	$2,510,271		1 year
Polk County School Board	Lewis-Anna Woodbury Elem 610 S Charleston Ave Fort Meade, FL 33841	Lewis-Anna Woodbury Elem Improve flat/ballasted roofs to metal Blds 1, 2, 5, 6, 7, 8	Property Protection	Rertrofit flat and ballasted roof systems to reduce future wind and water damage	Hurricanes & Tropical Storms	Existing	School Board	Facilities	$1,294,752		1 year
Polk County School Board	Medulla Elementary 850 Schoolhouse Road Lakeland, FL 33813	Medulla Elementary Improve flat/ballasted roofs to metal Blds 2, 3, 4, 5	Property Protection	Rertrofit flat and ballasted roof systems to reduce future wind and water damage	Hurricanes & Tropical Storms	Existing	School Board	Facilities	$3,471,853		1 year
Polk County School Board	North Lakeland Elementary 410 W Robson St Lakeland, FL 33805	North Lakeland Elementary Improve flat/ballasted roofs to metal Blds 1, 2, 3, 4,5	Property Protection	Rertrofit flat and ballasted roof systems to reduce future wind and water damage	Hurricanes & Tropical Storms	Existing	School Board	Facilities	$2,516,747		1 year
Polk County School Board	Walter Caldwell Elementary 141 Dairy Road Auburndale, FL 33823	Walter Caldwell Elementary Improve flat/ballasted roofs to metal Blds 1, 2, 3, 4,8, 12,16, 17	Property Protection	Rertrofit flat and ballasted roof systems to reduce future wind and water damage	Hurricanes & Tropical Storms	Existing	School Board	Facilities	$2,120,580		1 year
Polk State College	Polk State College	Wet and Dry Flood Proofing Systems for LAC Electrical Room	Infrastructure	Wet and Dry Flood Proofing Systems for LAC Electrical Room	Flood	Both	Polk State College	Facilities	$85,836.00	HMGP	12-18 Months
Winter Haven	Winter Haven	Fire Station 2 Infrstructure	Hardending facility	Hardening of Building, Bay doors, windows	All	New	City of Winter Haven	Public Safety	52,000	HMGP, FEMA	12-60 Months
Winter Haven	Winter Haven	Harden Public Works Facility	Critical Facilities	Improve facility where Public Works Operations including fleet maintenance is housed to better weather storm events.	All	Existing	Winter Haven	Public Works	$300,000.00	HMGP,City Budget	12-18 months

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Jurisdiction Benefitted	Jurisdiction (Location of Project)	Project Name	Project Type	Description	Hazard Mitigated*	Address New or Existing	Responsible Agency	Responsible Department	Estimated Cost	Possible Funding Source(s)	Time to Complete
Winter Haven	Winter Haven	Infrastructure	WWTP #2 By-Pass Pump	During storm events, the primary sewage lift station for WWTP #2 has experienced failure conditions. A diesel driven by-pass pump will eliminate future santiary sewer overflows (SSO).	All	Existing	City of Winter Haven	Utility Services	$74,643	HMGP, FEMA	12-18 Months
Winter Haven	Winter Haven	Infrastructure	Lift Station Generators	Lift Station Generators - The City owns and operates 210 santiary sewer lift stations. Emergency power is available to 36 lift stations with permanent generators. The City owns 7 portable generators and 5 portable by-pass pumps to prevent santiary sewer overflows. To prevent future sanitary sewer overflows, the City should provide emergency power or pumping capacity to 50% of the lift stations. This would require 57 additional generators or by-pass pumps.	All	Both	City of Winter Haven	Utility Services	$3,500,000	HMGP, FEMA	12-60 Months
Winter Haven	City of Winter Haven	Lift Station Generators	Infrastructure	Lift Station Generators	All	Both	City of Winter Haven	Utility Services	$210,848.00	HMGP	12-18 Months
Winter Haven	All	Public Education/Outreach	Education, Public Awareness	Ongoing mitigation initiative designed to mitigate the impact of various disasters by educating residential and commercial property owners of the hazards they face, vulnerability from hazards, and action s they can take to reduce the impacts of these hazards before they occur. Activities include participation in the National Weather Service Weather Ready Nation/Storm Ready program, partnerships with the Lakeland Flying Tigers minor league baseball team to host the annual Ready Night, use of social medial, and other outreach mechanisms.	All	Both	County Public Safety Departments (Fire, EMS, E-911, etc)	Public Safety	25,000	Public Safety Admin	Annual and Bi-annual
Winter Haven	Winter Haven	City Pipe System Replacement	Drainage	Area's pipe system has deteriorated, needs replacement	Flood	Both	Winter Haven	Utility Services	$1,100,000	HMGP	12-18 Months
Winter Haven	Winter Haven	Lake Howard Stormwater Park overflow pipe replacement	Drainage	The pipe drainaing from 21st street to Lake Howard is in need of replacement, purchase and reroute drainage through the adjacent wetland to mitigate storm impacts.	Flood	Both	Winter Haven	Public Works	$1,500,000.00	HGMP,SWFWMD, FDEP, City Budget	12-18 Months
Winter Haven	Winter Haven	Land Acquisition - Flood Prevention	Flood Storage and Prevention	The City has identified approximately 5,500 acres of drained wetlands. Restoring the wetlands would increase water storage and reduce flooding during storm events throughout the Winter Haven area.	Flood	Both	City of Winter Haven	Utility Services	$44,000,000	HMGP, FEMA	12-60 Months
Winter Haven	Winter Haven	Saphire Necklace	Water storage	Purchaase land and construct the Saphire Necklace, a regional water storage system planned in Winter Haven to store water, restore wetland areas, and alleviate downstream flooding.	Flood	Both	Winter Haven	Utilitiy Services/Natural Resources/Growth Management	1,100,00	HMPG	12-60 Months
Winter Haven	Winter Haven	Stormwater line clearing	Drainage	routinely inspect, maintain, and repair stormwater lines throughout the City	Flood	Both	Winter Haven	Public Works	$500,000.00	City Beget	On going annually
Winter Haven	Winter Haven	Street Sweeping	Drainage	Sweep streets in areas where stormwater system exists to limit debris build up in system.	Flood	Both	Winter Haven	Public Works	$140,000.00	City Beget	On going annually
Winter Haven	Winter Haven	Grey to Green stormwater pond alterations	Drainage	Retrofit existing stormwater ponds in high infiltration areas by utilizing landscape buffer areas increasing storage and infiltration of stormwater and reducing the size of existing traditional ponds.	Flood/Water quality	Existing	Winter Haven	Public Works/Natural Resources	1,500,00	HMPG	12-60 Months
Winter Haven	Winter Haven	Traffic Response Enhancement	Emergency Traffic Management	Currently maintain battery backups for traffic signals that provide short term support in the event of power failure	Traffic	Both	Winter Haven	Public Works	$150,000.00	City Budget	On going annually
Winter Haven	Winter Haven	Traffic Response Enhancement	Emergency Traffic Management	Purchase 10 small generators to be able to utilize traffic signals when power is down.	Traffic	Both	Winter Haven	Public Works	$25,000.00	HGMP	6 months

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Jurisdiction Benefitted	Jurisdiction (Location of Project)	Project Name	Project Type	Description	Hazard Mitigated*	Address New or Existing	Responsible Agency	Responsible Department	Estimated Cost	Possible Funding Source(s)	Time to Complete
Winter Haven	Winter Haven	Emergency power generation @ the Winter Haven Regional Airport	Infrastruture	Install power generation infrastruture to provide resiliency and insure continuous operation and utilization of a major transportation facility (the airport) Provide power to Winter Haven Airport for continious power, Providing an alternate LSA		Both	Winter Haven	Growth Management	250,000.00	HMPG	12-60 Months

APPENDIX C

APPENDIX C – PLANNING PROCESS DOCUMENTATION

Appendix C provides information on the Polk County 2020 Multi-jurisdictional Local Mitigation Statement (LMS) planning process. Included is a roster of individuals who represent each jurisdiction in Polk County to the LMS Working Group. Larger jurisdictions may have more than one representative. Some smaller jurisdictions designated staff from the Central Florida Regional Planning Council to serve as their representatives.

The COVID-19 pandemic impacted the second stage of the public engagement component of the 2020 LMS update as described in Section III. Social distancing and safer-at-home orders limited the opportunities for in-person public engagement.

This Appendix includes the following items:

- LMS Working Group membership roster
- Survey results
- LMS Working Group meeting flyers, agendas, sign-in sheets, presentations, and minutes
- Community event support information

Events related to the update of the LMS document include:

- December 29, 2016 LMS Working Group meeting
- October 26, 2017 LMS Working Group meeting
- September 9, 2019 LMS Working Group meeting
- September 28-29, 2019 Home and Garden Show
- October 21, 2019 LMS Working Group meeting
- October 29, 2019 City of Fort Meade community workshop
- December 3, 2019 LMS Working Group meeting
- December 10, 2019 Goals and Objectives Subgroup meeting
- January 10, 2020 Emergency Preparedness Advisory Council meeting
- January 15, 2020 Goals and Objectives Subgroup meeting
- January 22, 2020 LMS Working Group meeting
- January 31, 2020 CRS Subgroup meeting
- February 18, 2020 LMS Working Group meeting
- February 22, 2020 Lake Alfred Heritage Festival
- February 22-23, 2020 Home and Garden Show
- May 14, 2020 CRS Subgroup meeting
- June 17, 2020 LMS Working Group meeting

To ensure compliance with Americans with Disabilities Act (ADA) accessibility, this report does not include the documents listed above. Please contact Polk County Emergency Management at 863-298-7000 for assistance.

APPENDIX D

APPENDIX D – LMS PLAN CROSSWALK

Appendix D includes the completed 2020 crosswalk for the draft Polk County 2020 Multi-Jurisdictional Local Mitigation Strategy (LMS).

- LMS Plan crosswalk

2020 Florida Local Mitigation Strategy (LMS) Crosswalk

INSTRUCTIONS:

Enter the requested information in each field below. For each requirement, **please populate the "Location in Plan" cells with your plan page numbers.** The National Flood Insurance Program's (NFIP) Community Rating System (CRS) Crosswalk and EMAP standards have been integrated into the LMS Crosswalk to facilitate review of the planning requirements under this program. The CRS requirements can be hidden or shown by clicking the "+ / -" on the left hand side of the worksheet depending on whether or not communities choose to participate. If your community chooses to minimize the CRS requirements in this worksheet, please select the review tab, click on "Unprotect Sheet", click the "-" next to each CRS requirement, and click "Protect Sheet" to ensure the funtionality of the tool.

Jurisdiction:	**Title of Plan:**	**Date of Plan:**
Polk County	Polk County Multi-Jurisdictional	DRAFT: 02/28/20 & 05/06/20

Local Point of Contact:	**Address:**
Greg Becker, FPEM	1890 Jim Keene Blvd. , Winter Haven, FL 33880
Title: Emergency Management Program Manager	
Agency: Polk County Emergency Management	
Phone Number: 863-298-7023	**Email:** Gregbecker@polk-county.net

State Reviewer:	**Title:**	**Date:**
Date Received by FDEM:		
Date Plan Not Approved:		
Date Plan Approved Pending Adoption:		
Date Plan Approved:		

FEMA Reviewer:	**Title:**	**Date:**
Date Received by in FEMA Region IV:		
Date Plan Not Approved:		
Date Plan Approved Pending Adoption:		
Date Plan Approved:		

Planning Process		Location in Plan	Met	Not Met
P1.	Does the LMS document the planning process, including how it was prepared (with a narrative description, meeting minutes, sign-in sheets, or another method)?	Section III, pp. 2-3; Appendix C		
P2.	Does the LMS list the jurisdiction(s) participating in the plan that are seeking approval?	Section III, page 4		
P3.	Does the plan identify who represented each jurisdiction? (At a minimum, it must identify the jurisdiction represented and the person's position or title and agency within the jurisdiction.)	Appendix C Roster and Meeting Sign-in Sheets		
Reviewer Comments:				
Required Revisions:				

Planning Process (continued)		Location in Plan	Met	Not Met
P4.	Does the LMS document an opportunity for neighboring communities, local, and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development, as well as other interested parties to be involved in the planning process?	Section III, pp. 7-10; Appendix C		
P5.	Does the plan identify how the stakeholders were invited to participate in the process?	Section III, pp 7-10 and 12-13		
P6.	Does the LMS document how the public was involved in the planning process during the drafting stage?	Section III, pp 7-10 and 12-13		
Reviewer Comments:				
Required Revisions:				

Planning Process (continued)		Location in Plan	Met	Not Met
P7.	Does the LMS describe the review and incorporation of existing plans, studies, reports, and technical information?	Section III, pp. 12-101 and Section IX		
Reviewer Comments:				
Required Revisions:				

Hazard Risk and Vulnerability Assessment		Location in Plan	Met	Not Met
R1.	Does the Plan include a ***general description*** of all natural hazards that can affect each jurisdiction?	Section V		
R2.	Does the Plan provide rationale for the omission of any natural hazards that are commonly recognized to affect the jurisdiction(s) in the planning area?	Section V, pp. 1-5 including Table 5-2		
Reviewer Comments:				
Required Revisions:				

Hazard Risk and Vulnerability Assessment (cont)		Location in Plan	Met	Not Met
R3.	Does the Plan include a description of the ***location*** for all natural hazards that can affect each jurisdiction?	Throughout Section V and Appendix A		
Reviewer Comments:				
Required Revisions:				

Hazard Risk and Vulnerability Assessment (cont)		Location in Plan	Met	Not Met
R4.	Does the Plan include a description of the ***extent*** for all natural hazards that can affect each jurisdiction?	Throughout Section V		
Reviewer Comments:				
Required Revisions:				

Hazard Risk and Vulnerability Assessment (cont)		Location in Plan	Met	Not Met
R5.	Does the Plan include information on ***previous occurrences*** of hazard events for each jurisdiction?	Throughout Section V		
Reviewer Comments:				
Required Revisions:				

Hazard Risk and Vulnerability Assessment (cont)		Location in Plan	Met	Not Met
R6.	Does the Plan include information on the ***probability*** of future hazard events for each jurisdiction?	Throughout Section V		
Reviewer Comments:				
Required Revisions:				

Hazard Risk and Vulnerability Assessment (cont)		Location in Plan	Met	Not Met
R7.	Is there a description of each hazard's ***impacts*** on each jurisdiction (what happens to structures, infrastructure, people, environment, etc.)? Does this also include a list of critical facilities to remain open during times of a disaster?	Throughout Section VI - Required Revision pg VI-10		
Reviewer Comments:				
Required Revisions:				

Hazard Risk and Vulnerability Assessment (cont)		Location in Plan	Met	Not Met
R8.	Is there a description of each identified hazard's ***overall vulnerability*** (structures, systems, populations or other community assets defined by the community that are identified as being susceptible to damage and loss from hazard events) for each jurisdiction?	Throughout Section VI		
Reviewer Comments:				
Required Revisions:				

Hazard Risk and Vulnerability Assessment (cont)		Location in Plan	Met	Not Met
R9.	Does the Plan describe the type (residential, commercial, institutional, etc.) and number of FEMA repetitive loss properties within each jurisdiction?	Section V, pp. 52-53		
Reviewer Comments:				
Required Revisions:				

Mitigation Strategy		Location in Plan	Met	Not Met
S1.	Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards?	Section VII, pp. 3-6		
Reviewer Comments:				
Required Revisions:				

Mitigation Strategy (continued)		Location in Plan	Met	Not Met
S2.	Does the plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs?	Section III, pp. 17-101		
Reviewer Comments:				
Required Revisions:				

Mitigation Strategy (continued)		Location in Plan	Met	Not Met
S3.	Does the Plan address whether or not each jurisdiction participates in the National Flood Insurance Program (NFIP) and how they will continue to comply with NFIP requirements?	Section IV, pps. 26-28; Section VII, pp. 14		
Reviewer Comments:				
Required Revisions:				

Mitigation Strategy (continued)		Location in Plan	Met	Not Met
S4.	Does the Plan identify and analyze a comprehensive range (different alternatives) of specific mitigation actions and projects to reduce the impacts from hazards?	Section VII, pps. 11-19		
Reviewer Comments:				
Required Revisions:				

Mitigation Strategy (continued)		Location in Plan	Met	Not Met
S5.	Does the Plan identify mitigation actions for every hazard posing a threat to each participating jurisdiction?	Section VII, pps. 11-19 and Appendix B, Mitigation Action Plan (MAP)		
Reviewer Comments:				
Required Revisions:				

Mitigation Strategy (continued)		Location in Plan	Met	Not Met
S6.	Do the identified mitigation actions and projects have an emphasis on ***new and existing*** buildings and infrastructure?	Appendix B, Mitigation Action Plan (MAP)		
S7.	Does the Plan explain how the mitigation actions and projects will be prioritized (including cost benefit review)?	Section VII, pp. 19-23		
S8.	Does the Plan identify the position, office, department, or agency responsible for implementing and administering the action/project, estimated cost, potential funding sources and expected timeframes for completion?	Appendix B, Mitigation Action Plan (MAP)		
Reviewer Comments:				
Required Revisions:				

Mitigation Strategy (continued)		Location in Plan	Met	Not Met
S9.	Does the LMS identify the local planning mechanisms where hazard mitigation information and/or actions may be incorporated?	Section III, pps. 12-13 and 101		
S10.	Does the plan describe each community's process to integrate the data, information, and hazard mitigation goals and actions into other planning mechanisms?	Section III, pps. 13-14		
S11.	The updated plan must explain how the jurisdiction(s) incorporated the mitigation plan, when appropriate, into other planning mechanisms as a demonstration of progress in local hazard mitigation efforts.	Section III, pp. 17-101		
Reviewer Comments:				
Required Revisions:				

Plan Evaluation and Maintenance		Location in Plan	Met	Not Met
M1.	Was the plan revised to reflect changes in development?	Section IV, pp. 17-25 - Required Revision p. 26		
M2.	Was the plan revised to reflect progress in local mitigation efforts? (Were projects completed, deleted or deferred and why if they were deleted or deferred?)	Appendix B, Mitigation Action Plan (MAP)		
M3.	Was the plan revised to reflect changes in priorities since the plan was previously approved?	Section II and Section III pp. 2-3		
Reviewer Comments:				
Required Revisions:				

Plan Evaluation and Maintenance (continued)		Location in Plan	Met	Not Met
M4.	Does the plan identify how, when, and by whom the plan will be monitored (how will implementation be tracked) over time?	Section III, p. 10		
M5.	Does the plan identify how, when, and by whom the plan will be evaluated (assessing the effectiveness of the plan at achieving stated purpose and goals) over time?	Section III, p. 11		
M6.	Does the plan identify how, when, and by whom the plan will be updated during the 5-year cycle?	Section III, p. 11		
Reviewer Comments:				
Required Revisions:				

Plan Evaluation and Maintenance (continued)		Location in Plan	Met	Not Met
M7.	Is there discussion of how the community(ies) will continue public participation in the plan maintenance process?	Section III, p. 12		
Reviewer Comments:				
Required Revisions:				

Plan Adoption		Location in Plan	Met	Not Met
A1.	Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval?	Section VIII, page VIII-2 and Appendix H		
A2.	For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption?	Section VIII, page VIII-2 and Appendix H		
Reviewer Comments:				
Required Revisions:				

APPENDIX E

APPENDIX E – WILDFIRE RISK ASSESSMENT REPORTS

Appendix E includes the wildfire risk assessment reports for Polk County listed below.

- The Southern Wildfire Risk Assessment Report for Polk County generated through the Southern Wildfire Risk Assessment Web Portal (southWRAP) on February 4, 2020.

- The Polk County Community Wildfire Protection Plan dated June 2011.

To ensure compliance with Americans with Disabilities Act (ADA) accessibility, this report does not include the documents listed above. Please contact Polk County Emergency Management at 863-298-7000 for assistance.

APPENDIX F

APPENDIX F – POTENTIAL FUNDING AND TECHNICAL ASSISTANCE SOURCES

Appendix F includes a listing of potential funding and technical assistance sources available for mitigation project implementation.

- Potential funding and technical assistance sources

APPENDIX F –POTENTIAL FUNDING AND TECHNICAL ASSISTANCE SOURCES

Polk County continuously explores funding sources and technical assistance opportunities for mitigation projects by utilizing resources at the local, State, and Federal levels, and by maintaining contact with funding agencies and partners throughout the region. All mitigation funding activities are required to follow the Hazard Mitigation Assistance Unified Guidance, FEMA, February 2015 guidelines. All projects must be cost beneficial and technically feasible.

The Florida Division of Emergency Management maintains a list of potential mitigation funding sources.

The following are potential sources for funding and technical assistance to implement the objectives of the LMS Plan.

The Bureau of Land Management (BLM)

Community Assistance and Protection Program

Purpose: To reduce and prevent wildland fire threats and losses to communities and natural resources through mitigation, education, and outreach. National Fire Prevention and Education teams are sent to at-risk wildland fire areas across the country where the teams work with local residents to help reduce the number of human-caused fires through implementation of wildland fire prevention programs. The BLM also facilitates FIREWISE and other workshops to help people live safely in the wildland-urban interface. Other specialists assist communities by completing comprehensive wildland-urban interface community risk assessments and plans.

Contact Information: BLM Washington Office
1849 C Street NW
Room 5665
Washington DC 20240
(202)208-3801
https://www.blm.gov/

Florida Department of Environmental Protection (FDEP)

Land and Recreation Grants

Purpose: To promote and foster partnerships to enhance and sustain Florida's natural and cultural resources and to provide increased outdoor recreational opportunities for Florida's citizens and visitors.

Contact Information: Florida Department of Environmental Protection
Division of State Lands
3900 Commonwealth Blvd., MS 100
Tallahassee, FL 32399-3000
(850) 245-2555
www.dep.state.fl.us/Grants/

Expanded Division of Waste Management

Purpose: To implement State and Federal laws to protect the environment from the improper handling and disposal of solid and hazardous wastes. This includes regulatory programs for waste facilities and pollutant storage systems and non-regulatory activities such as financial and technical assistance for recycling and waste reduction. The Division also oversees and contracts for the cleanup of sites contaminated with petroleum products, dry cleaning solvents, or other hazardous wastes. The four program areas within the Division of Waste Management are Permitting and Compliance Assistance, District and Business Support, Waste Cleanup and Petroleum Restoration.

Contact Information: Florida Department of Environmental Protection
2600 Blair Stone Road, MS #4500
Tallahassee, FL 32399
850-245-8705
https://floridadep.gov/waste

Florida Communities Trust (FCT)

Purpose: To assist communities in protecting important natural resources, providing recreational opportunities, and preserving Florida's traditional working waterfronts through the competitive grant criteria of the Parks and Open Space Florida Forever Grant Program and the Stan Mayfield Working Waterfronts Florida Forever Grant Program. These grants provide funding to local governments and eligible nonprofit organizations for land acquisition for parks, open space, and greenways and for projects which support Florida's seafood harvesting and aquaculture industries. The source of funding for the Trust comes from Florida Forever proceeds.

Contact Information: Florida Department of Environmental Protection
Florida Communities Trust
3900 Commonwealth Blvd, M.S. 100
Tallahassee, FL 32399
(850) 245-2118
http://www.dep.state.fl.us/

APPENDIX F: POTENTIAL FUNDING AND TECHNICAL ASSISTANCE SOURCES

Federal Emergency Management Agency (FEMA)

Contact Information: Federal Emergency Management Agency
500 C Street SW
Washington, DC 20472
(202) 646-2500
https://www.fema.gov/

(contact information is applicable to all FEMA funds, grants, and programs listed below, unless otherwise provided)

Cora C. Brown Fund

Purpose: To help provide for disaster-related needs that have not, or will not, be met by governmental agencies or any other organization which has programs to address such needs. This Fund is for survivors of presidentially declared major disasters or emergencies not caused by or attributable to war. Disaster survivors need not apply for this assistance. Upon applying for Disaster Assistance, FEMA will identify potential recipients.

Website: https://www.fema.gov/media-library/assets/documents/24409

Fire Management Assistance Grants

Purpose: To provide project grants and specialized services for the mitigation, management, and control of any fire on publicly (non-Federal) or privately owned forestland or grassland that threatens such destruction as would constitute a major disaster. There may be a 25 percent non-Federal cost share if total eligible costs for the declared fire exceed certain thresholds. Fire Management Assistance grants are authorized by the Robert T. Stafford Disaster Relief and Emergency Assistance Act and are funded by FEMA. This program replaces the former Fire Suppression Assistance Program.

Flood Hazard Mapping Program

Purpose: To identify, publish, and update information for all flood prone areas of the United States for the purpose of informing the public of flooding risks, supporting sound floodplain management, and establishing flood insurance premium rates. As natural and manmade changes to watersheds and floodplains can change flood hazard conditions over time, FEMA provides grant funds to designated Cooperating Technical Partners (CTPs) and others to develop up-to-date flood hazard data, provide maps and data in digital format, integrate FEMA's community and State partners into the process, and raise public awareness of flood risks. Assistance includes financial grants to CTPs and other entities for such activities as refinement of Zone A

boundaries, hydrologic and hydraulic analyses and floodplain mapping, Digital Flood Insurance Rate Map (DFIRM) production, and re-delineation of floodplain boundaries using updated topographic data. FEMA technical assistance services are provided in the form of base map inventory, digital base map data sharing, DFIRM maintenance, hydrologic and hydraulic review, assessment of community mapping needs to support the Map Needs Update Support System, and technical standards agreements. Cost shares are negotiated between FEMA and recipients.

Flood Mitigation Assistance (FMA) Program

Purpose: To provide funding to States, territories, Federally recognized tribes and local communities for projects and planning that reduces or eliminates long-term risk of flood damage to structures insured under the National Flood Insurance Program (NFIP). FMA funding is also available for management costs. Funding is annually appropriated by Congress. The FMA program is authorized by Section 1366 of the National Flood Insurance Act of 1968, as amended with the goal of reducing or eliminating claims under the NFIP.

Grants: There are three types of FMA grants available to States and municipalities/localities:

- *Planning Grants* to prepare flood mitigation plans.
- *Project Grants* to implement measures to reduce flood losses, such as elevation, acquisition or relocation of NFIP-insured structures.
- *Management Cost Grants* for the grantee to help administer the FMA program and activities.

Program Contact Information: Program Implementation Division
(202) 646-3619
https://www.fema.gov/flood-mitigation-assistance-grant-program

Hazard Mitigation Grant Program (HMGP)

Purpose: To help communities implement hazard mitigation measures following a Presidential Major Disaster Declaration in the areas of the State, tribe, or territory requested by the Governor or Tribal Executive. The key purpose of this grant program is to enact mitigation measures that reduce the risk of loss of life and property from future disasters. The HMGP webpage includes extensive resources and job aids to streamline project implementation. The primary guidance document for this program is the HMA Guidance. HMGP is authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act.

Website: www.fema.gov/hazard-mitigation-grant-program

National Flood Insurance Program (NFIP)

Purpose: To reduce the impact of flooding on private and public structures by providing affordable insurance to property owners, renters and businesses, and encouraging communities to adopt and enforce floodplain management regulations that will 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 general risk insurance, but also of flood insurance, specifically.

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

Pre-Disaster Mitigation (PDM) Program

Purpose: To assist communities in implementing hazard mitigation programs designed to reduce overall risk to the population and structures before the next disaster occurs. The PDM program is authorized by Section §203 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), as amended by Section §102 of the Disaster Mitigation Act of 2000.

Eligible Projects Include:

- Property acquisition, relocation or demolition.
- Structural and non-structural retrofitting (e.g. elevation, storm shutters, and hurricane clips).
- Minor structural hazard control protection (e.g. culverts, floodgates, retention basins).
- Localized flood control projects designed to protect critical facilities that are not part of a larger flood control system.

Ineligible Activities Include:

- Major flood control projects.
- Engineering designs that are not integral to a proposed project.
- Feasibility and drainage studies that are not integral to a proposed project.
- Flood studies that are not integral to a proposed project and mapping.
- Response and communication equipment (e.g. warning systems, generators that are not integral to a proposed project).

Program Contact Information: Program Implementation Division
(202) 646-3619
https://www.fema.gov/pre-disaster-mitigation-grant-program

Severe Repetitive Loss (SRL) Program

Purpose: To provide funding for the reduction or elimination of long-term risk for flood damage to severe repetitive loss structures insured under the National Flood Insurance Program (NFIP). An SRL property is defined as a residential property, covered under a NFIP flood insurance policy, which has:

- At least four NFIP claim payments (including building and contents) over $5,000 each, and the cumulative amount of such claims payments exceeds $20,000; or
- At least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.

For both items above, at least two of the referenced claims must have occurred within any ten-year period, and must be greater than 10 days apart.

The Severe Repetitive Loss (SRL) grant program is authorized by the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004, which amended the National Flood Insurance Act of 1968.

Program Contact Information: (866) 927-5646

Housing and Urban Development (HUD)

Contact Information: Department of Housing and Urban Development
451 7th Street, SW
Washington, DC 20410
(202) 708-1112

(contact information is applicable to all HUD grants and programs listed below, unless otherwise provided)

Community Development Block Grant - Disaster Recovery Program (DRP)

Purpose: To provide flexible grants which help cities, counties, and States recover from Presidentially-declared disasters, especially in low-income areas. Since this program funds a broader range of recovery activities than most other programs, the DRP funding can help communities and neighborhoods that otherwise might not recover due to limited resources. When disasters occur, Congress may appropriate additional funding for the Community Development Block Grant as DRP grants to rebuild the affected areas and bring crucial seed money to start the recovery process. Grantees may use DRP funds for recovery efforts involving housing, economic development, infrastructure and prevention of further damage, if such use does not

duplicate funding available from FEMA, the Small Business Administration (SBA), and the United States Army Corps of Engineers (USACE).

Examples of Activities:

- Buying damaged property in a floodplain and relocating residents to safer areas.
- Providing relocation payments for people and businesses displaced by the disaster.
- Removing debris.
- Rehabilitating homes and buildings damaged by the disaster.
- Buying, constructing, or rehabilitating public facilities such as water and sewer systems, streets, neighborhood centers, and government buildings.
- Code enforcement.
- Planning and administration costs (limited to no more than 20 percent of the grant).

HUD notifies eligible governments, and they must then develop and submit an Action Plan for Disaster Recovery in order to receive DRP grants. The Action Plan must describe the needs, strategies, and projected uses of the Disaster Recovery funds.

Program Contact Information: Office of Community Planning and Development
https://www.hudexchange.info/cdbg-dr/

Community Development Block Grants (CDBG)/Entitlement Grants

Purpose: To develop viable urban communities by providing decent housing and a suitable living environment, and by expanding economic opportunities, principally for low to moderate income individuals.

Grant Contact Information: Entitlement Communities Division Office of Block Grant Assistance
Community Planning and Development
http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/communitydevelopment/programs

Emergency Shelter Grants (ESG) Program

Purpose: To provide financial assistance to renovate or convert buildings for use as emergency shelters for the homeless. Grant funds may also be used to operate the shelter (excluding staff) and pay for certain support services.

Contact Information: Dept. of Housing and Urban Development
Charles Bennett Federal Bldg.
400 West Bay Street
Suite 1015
Jacksonville, FL 32202-4410
(904) 232-2627

Health and Economic Agencies

Public Works & Economic Development Facilities Grants

Propose: To promote long-term economic development in areas experiencing substantial economic distress. The United States Economic Development Administration (EDA) provides Public Works grants to support the construction or rehabilitation of essential public infrastructure and facilities necessary to generate or retain higher-skill and higher-wage jobs and private investment.

Contact Information: Economic Development Administration
401 West Peachtree Street NW
Atlanta GA 30308-3510
(404) 730-3002

Physical Disaster Loans

Purpose: To provide loans to businesses and homeowners for uninsured losses in areas affected by declared physical disasters.

Contact Information: Office of Disaster Assistance
US Small Business Administration
233 Peachtree Street NE
Suite 1800
Atlanta GA, 30303
(404) 331-4999
https://www.sba.gov/

My Safe Florida Home Program

Purpose: To provide trained and certified inspectors to perform inspections for owners of site-built, single-family, residential properties; and to provide grants to eligible applicants to mitigate or retrofit residential properties to make them less vulnerable to hurricane damage. Grant funding may also be used to repair existing structures for low-income homeowners. The Florida Department of Financial Services provides fiscal accountability, contract management, and strategic leadership for the program. Implementation of

this program is subject to annual legislative appropriations. *(Florida Statutes 215.5586)*

Contact Information: Florida Department of Financial Services
200 East Gaines Street
Tallahassee FL 32399
(877) 693-5236
https://floridadisaster.org/

Emergency Management Preparedness and Assistance (EMPA) Competitive Grant Program

Purpose: To provide funding on a dollar for dollar match basis for projects that promote community preparedness, public information and education. Critical facility projects must conform to the hurricane vulnerability guidelines as established in the American Red Cross (ARC) 4496 standards.

Contact Information: Jenene Helms, Community Assistance Consultant
Florida Division of Emergency Management
2555 Shumard Oak Boulevard
Tallahassee, FL 32399-2100
(850) 815-4000
www.floridadisaster.org

United States Army Corps of Engineers (USACE)

Contact Information: Commander US Army Corps of Engineers
Attn: CECW- OE
Washington, DC 20314-1000
(202) 272-0251
http://www.usace.army.mil/

(contact information is applicable to all USACE programs listed below, unless otherwise provided)

Continuing Authorities Program (CAP)

Purpose: To plan, design, and construct water resources projects of limited scope and complexity. A local sponsor must identify the flood-related problem and request US Army Corps of Engineers (USACE) Assistance. Small flood control projects are also eligible. Once the Corps determines the project fits the program, the USACE's local district office reviews the local sponsor's request for assistance and requests funds from the USACE's annual appropriations to initiate a feasibility phase to determine Federal interest in proceeding. If

there is interest, the project moves into the plans and specifications phase, and finally into the construction phase. The cost share for the CAP is 65 percent USACE and 35 percent local. The Federal project limit is $7,000,000.

Emergency Operations Flood Response and Post Flood Response

Purpose: To provide emergency flood response and post flood response assistance as required to supplement State and local efforts and capabilities in time of flood or coastal storm.

Small Flood Control Projects

Purpose: To plan, design and construct certain small flood control projects. Each project selected must be economically justified (benefits exceed costs), technically feasible, and environmentally acceptable and complete within itself. No cost share is required for the first $100,000 of planning study costs. Study costs in excess of $100,000 will be shared 50 percent Federal and 50 percent non-Federal. The sponsor must contribute 35 percent (minimum 5 percent cash) of the total project design and construction cost as cash, in-kind services or Lands, Easements, Rights-of-way, Relocations, and Disposal areas (LERRDs).

Emergency Advance Measures for Flood Prevention

Purpose: To perform activities prior of flooding or flood fight that would assist in protecting against loss of life and damages to property due to flooding. Measures are aimed at protecting against loss of life or damages to property given an immediate threat of unusual flooding. Assistance includes aid from USACE for removal of waterway obstructions and work necessary to prevent dam failure. No match is required.

Protection of Essential Highways, Highway Bridge Approaches, and Public Works

Purpose: To provide bank protection of highways, highway bridges, essential public works, churches, hospitals, schools, and other nonprofit public services endangered by flood-caused erosion.

Contact Information: US Army Corps of Engineers
Attn: Lee Tew
441 G-Street NW
Washington, DC 20314-1000
(202) 761-1504
http://www.usace.army.mil/

Snagging and Clearing for Flood Control

Purpose: To conduct clearing, snagging, or channel excavation in the interest of flood control.

Contact Information: US Army Corps of Engineers
Attn: Lee Tew
441 G-Street NW
Washington, DC 20314-1000
(202) 761-1504
http://www.usace.army.mil/

Emergency Conservation Program

Purpose: To enable farmers and ranchers to perform emergency conservation measures to control wind erosion on farmlands, or to rehabilitate farmlands damaged by wind erosion, floods, hurricanes, or other natural disasters, and to carry out emergency water conservation or water enhancing measures during periods of severe drought.

Contact Information: US Department of Agriculture
Farm Service Agency
1400 Independence Dr.
Washington, DC 20250-0513
(202) 720-6221
http://www.fsa.usda.gov/

Emergency Watershed Protection (EWP) Program

Purpose: To provide relief from imminent hazards and reduce the threat to life and property in watersheds damaged by severe natural events. Hazards include floods and the products of erosion created by floods, fire, windstorms, earthquakes, drought, or other natural disasters. Assistance includes technical and financial aid to carry out emergency work such as debris removal from stream channels, culverts, and bridge abutments; debris removal in upland areas following windstorms and tornadoes; reshaping and protection of eroding streambanks; repair of damaged drainage facilities, levees and flood prevention structures; reseeding of burned or denuded areas; and promoting appropriate grazing practices under drought conditions to assist in watershed recovery. No match is required for easements and technical assistance. A twenty-five percent non-Federal match is required for other eligible measures. The USDA Natural Resources Conservation Service (NRCS) administers the EWP Program.

Contact Information: USDA
Bartow Service Center
1700 HWY 17 S
Bartow, FL 33830
(863) 533-2051
https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/landscape/ewpp/?&cid=nrcs143_008258

Resource Conservation and Development

Purpose: To encourage and improve the capability of State and local units of government and local nonprofit organizations in rural areas to plan, develop and carry out programs for resource conservation and development.

Contact Information: Deputy Chief for Programs
Resource Conservation and Community Development Division
Natural Resources Conservation Service
Department of Agriculture
P.O. Box 2890
Washington, DC 20013
(202) 720-2847
http://www.nrcs.usda.gov/

Soil and Water Conservation

Purpose: To promote and encourage the wise use, management and general conservation of soil, water, and related natural resources.

Contact Information: Natural Resources Conservation Service
Department of Agriculture
Karl Anderson
District Conservationist
1700 HWY 17 S
Bartow, FL 33830
(202) 720-4527 EXT X3
Karl.Anderson@usda.gov

Watershed Protection and Flood Prevention

Purpose: To protect, develop, and utilize the land and water resources in small watersheds of 250,000 acres or less. The program is Federally assisted and locally led. Projects are aimed at watershed protection, flood prevention, agricultural and non-agricultural water management, water quality improvement, erosion and sediment reduction, fish and wildlife enhancement, and water supply. Assistance includes financial and technical assistance for approved watershed projects. Technical assistance is provided for planning, designing, and installing watershed improvements. Financial

assistance is provided for watershed protection, flood prevention, agricultural water management, sedimentation control, and public water-based fish, wildlife, and recreation. No match is required for flood prevention; a 50 percent match is required for agricultural and non-agricultural water management. The Watershed Protection and Flood Prevention Program is funded by NRCS (Natural Resources Conservation Service).

Contact Information: Watersheds and Wetlands Division
Natural Resources Conservation Service
Department of Agriculture
P.O. Box 28890
Washington, DC 20013
(202) 720-3534
http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/wfpo/

Watershed Surveys and Planning

Purpose: To provide planning assistance to Federal, State, and local agencies for the development of coordinated water and related land resources programs in watersheds and river basins. Emphasis is on flood damage reduction, erosion control, water conservation, preservation of wetlands and water quality improvements. Technical assistance is provided. Types of surveys and plans include watershed plans, river basin surveys and studies, watershed resource assessments, flood hazard and floodplain management studies. Special priority is given to upstream rural community flooding; water quality improvements from agricultural non-point sources; wetland preservation; and drought management and water supply for agricultural and rural communities. No match is required. The Watershed Surveys and Planning Program is funded by NRCS (Natural Resources Conservation Service).

Contact Information: Watersheds and Wetlands Division
Natural Resources Conservation Service
Department of Agriculture
P.O. Box 28890
Washington, DC 20013
(202) 720-3534
http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/wsp/

Community Facilities Loan Program (USDA – Rural Development)

Purpose: To construct, enlarge, extend, or otherwise improve community facilities providing essential services to rural residents. This program provides affordable funding to develop essential community facilities in rural areas. An essential community facility is defined as a facility that provides an essential service to the local community for the orderly development of the community in a primarily rural area; this does not include private, commercial or business undertakings.

Contact Information: Philip Leary, State Director
4500 NW 27th Avenue
Suite D-2
Gainesville, FL 32606
(352) 338-3400
www.rd.usda.gov/FL

APPENDIX G

APPENDIX G – RELEVANT ARTICLES

Appendix G includes at least one relevant article addressing each of the hazards analyzed for the LMS update.

To ensure compliance with Americans with Disabilities Act (ADA) accessibility, this report does not include the documents listed above. Please contact Polk County Emergency Management at 863-298-7000 for assistance.

APPENDIX H

APPENDIX H – RESOLUTIONS ADOPTING THE 2020 LMS

Following notification of "Approval Pending Adoption" of the Polk County 2020 Multi-jurisdictional Local Mitigation Strategy (LMS) by Florida Division of Emergency Management and Federal Emergency Management Agency, Polk County and its jurisdictions may formally adopt the LMS at advertised public meetings. The LMS Working Group anticipates adoption of LMS by the following:

- Polk County
- City of Auburndale
- City of Bartow
- City of Davenport
- Town of Dundee
- City of Eagle Lake
- City of Fort Meade
- City of Frostproof
- City of Haines City
- Town of Hillcrest Heights
- Village of Highland Park
- City of Lake Alfred
- Town of Lake Hamilton
- City of Lake Wales
- City of Lakeland
- City of Mulberry
- Polk City
- City of Winter Haven
- Polk County Public Schools

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