Ben Hill County
Pre-Disaster Mitigation Plan

Chapter 2

Local Natural Hazard, Risk and Vulnerability (HRV) Summary

The Ben Hill County Pre-Disaster Mitigation Plan Committee evaluated all natural hazards affecting Ben Hill County and the City of Fitzgerald, and determined that the county and the city are at risk from**: high winds** caused by hurricanes, tropical storms, and tornadoes; **localized flooding** created by heavy rains associated with hurricanes, tropical storms, tropical depressions, and thunderstorms; **lightning** created by thunderstorms**; extreme heat and humidity; wildfires; and droughts.**

The Committee used National Weather Service data and available local information to assess the threat to Ben Hill County and City of Fitzgerald. Information on high winds and flooding in Ben Hill County is available, but more research on and evaluation of extreme heat and drought is required. Although the level of vulnerability from these hazards is unclear due to the lack of data, they have been included in this plan because of their potential to cause great harm to people and property in Ben Hill County. Accordingly, the action steps listed in the mitigation strategy in Chapter 4 for these hazards include conducting further research to determine the degree of risk that actually exists. Future steps can then be planned to mitigate such risk.

Repetitive damage to government infrastructure and private property is experienced from **localized flooding** caused by hurricanes, tropical storms, tropical depressions, intense thunderstorms and extended rainfall. Ben Hill County and City of Fitzgerald experienced significant damage in 1993, 1998, 2000 and 2003 from these types of storms. The potential for damage from the perennial flooding of Turkey Creek, which winds through southeastern Ben Hill County and within the city limits of Fitzgerald, may require extensive flood control measures to be implemented along the creek and its tributaries.

Repetitive damage to government infrastructure and individual property from **high winds** can be significant, particularly the cost of debris removal. Loss-of-life from high winds has been minimal. However, the risk to loss-of-life is increasing with the increase in population density. Ben Hill County is under the threat of hurricanes up to Category 3, tornadoes up to F5 and severe thunderstorms.

Loss-of-life can be directly attributed to **lightning** and indirectly to **heat stress.** Ben Hill County is subjected year-around to thunderstorms with threatening lightning. Annually, individuals are reported struck by lightning. Because of the combination of high humidity and high temperatures, Ben Hill County from June through September experiences conditions threatening to the health and life, particularly to those outside (field workers) and to the elderly unable to afford air-conditioning.

The Committee could not find credible information that indicated that speculative future climate changes would create significantly different weather hazards in the future than the past for Ben Hill County. Therefore, the Committee projected the weather experience of the past to predict the future.

Natural Hazards:

I. Hurricanes/Tropical Storms

A. Hurricane/Tropical Storm Identify.

A tropical cyclone above 74 miles per hour is considered a hurricane and poses threats such as high winds, heavy rainfall, and tornadoes. A cyclone develops over tropical waters, generally far removed from land areas, and usually moves westward under the influence of easterly winds. Most storms in Georgia approach from the southeast or southwest, from the Gulf of Mexico and the Atlantic. Secondary effects, such as tornadoes and flooding, can result from a hurricane and greatly impact inland communities. The period of vulnerability extends from June through November. Hurricanes are particularly dangerous and damaging to south-central Georgia and the panhandle of Florida. Ben Hill County is approximately 145 miles from the Gulf of Mexico coast, and about 145 miles from the Atlantic coast.

B. Hurricane/Tropical Storm Profile.

Hurricanes or tropical storms can threaten all of Ben Hill County and the City of Fitzgerald. In the recent past, one hurricane and two tropical storms have caused considerable damage to government infrastructure, mainly roads, and created considerable debris.

In 1995, Hurricane Opal passed over Ben Hill County, dumping large amounts of rain accompanied by high winds. The result was the closing of county roads due to high water, downed trees and power lines, and road repair and debris removal costs estimated from $100,000 to $150,000. In 1998, Tropical Storm Earl produced moderate to heavy rain and strong winds as it tracked northeast from southeast over east-central Georgia. Peak wind gusts of 40 to 50 mph were common, and Ben Hill County officials reported several county roads closed due to high water, flooding of low-lying areas, and power outages. Property damage across the region was estimated at $650,000. In 2004, Tropical Storm Jeanne moved north across south central Georgia with sustained winds up to 50 knots and up to nine inches of rainfall. Property damage was estimated to be $2.2 million.

See the National Climatic Data Center (NCDC) table in Appendix D for additional details regarding past hazard events in Ben Hill County. According to the Hazard Frequency Table, Appendix F, Ben Hill County has a 6% chance of a hurricane/tropical storm event annually.

C. Assets Exposed to Hurricanes/Tropical Storms.

All of Ben Hill County is equally exposed to hurricanes and tropical storms. Manufactured homes are more vulnerable than properly built stick-built homes, which are built to withstand a wind-load of 100 mph sustained.

Ben Hill County is covered with dense tree vegetation. This plant cover creates considerable debris in windstorms. Falling trees and broken limbs disrupt electrical power and communication transmission lines.

According to the ITOS Critical Facility Inventory database, Appendix A-I, the total replacement value of critical facilities in Ben Hill County is $119,879,572. No Ben Hill County or municipal critical facilities are located within areas with Sea, Lake, and Overland Surges from Hurricanes (SLOSH) hazard scores exceeding zero (no risk). As for the potential impact of hurricanes/tropical storms on the total built community, GIS tax parcel data reveals that there are 11,030 structures with a total value of $927,026,750 exposed to hurricanes/tropical storms in Ben Hill County (see Worksheet 3A in Appendix D). The estimated Ben Hill County population exposed to hurricanes/tropical storms is 17,484.

D. Estimated Potential Loss to Hurricanes/Tropical Storms.

The strength of the storm and/or the amount of rainfall will determine the loss from storms. Recent experience from Tropical Storm Jeanne in September 2004 confirmed that storms can cause millions of dollars in damages to government infrastructure and private property. As noted, the total replacement value of critical facilities in Ben Hill County is $119,879,572, but no critical facilities are located within areas with SLOSH hazard scores exceeding zero. GIS data shows that the value of the total built community exposed to hurricanes/tropical storms is $927,026,750. At this time, there are no known buildings, infrastructure or critical facilities to be located in the hazard zone requiring special mitigation strategies.

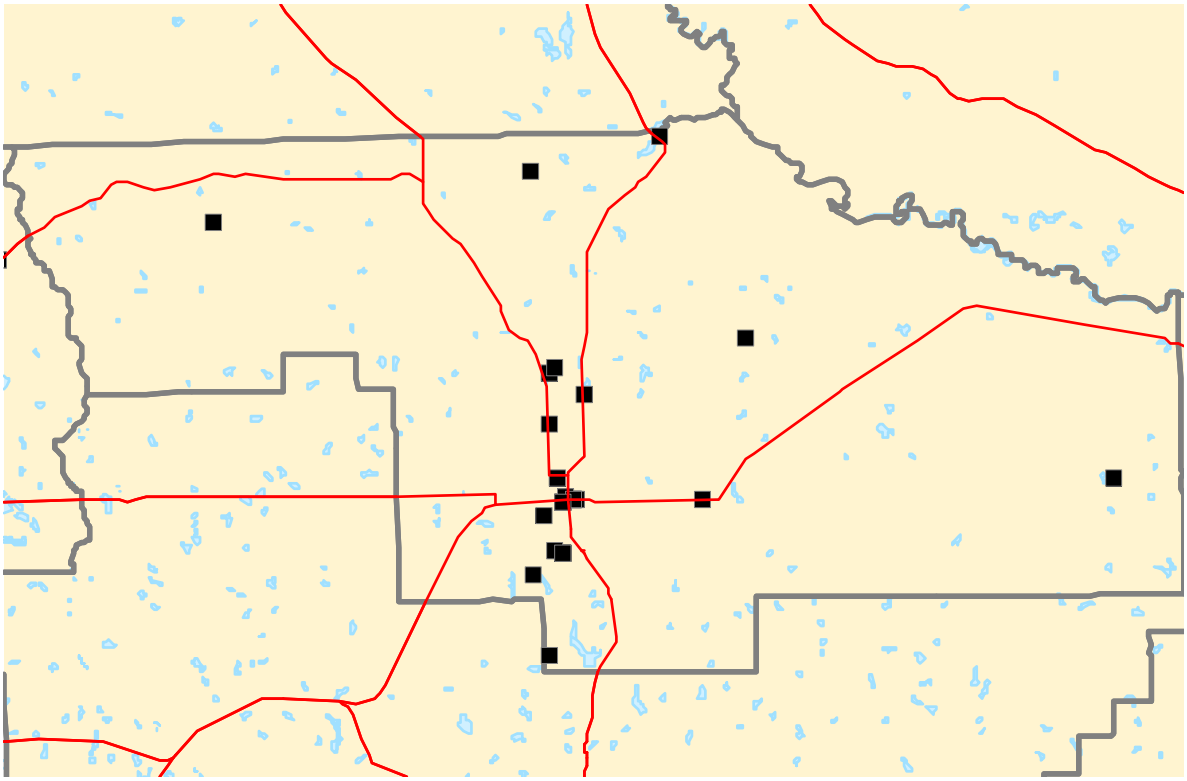
E. Land Use and Development Trends Related to Hurricanes/Tropical Storms.

Because the hurricane/tropical storm hazard zone is countywide, existing land use patterns and development trends will result in future development in the county that may be affected by hurricane/tropical storms. The mitigation strategy in Chapter 4 includes action steps intended to reduce the possible adverse effect on such development.

F. Multi-Jurisdictional Differences.

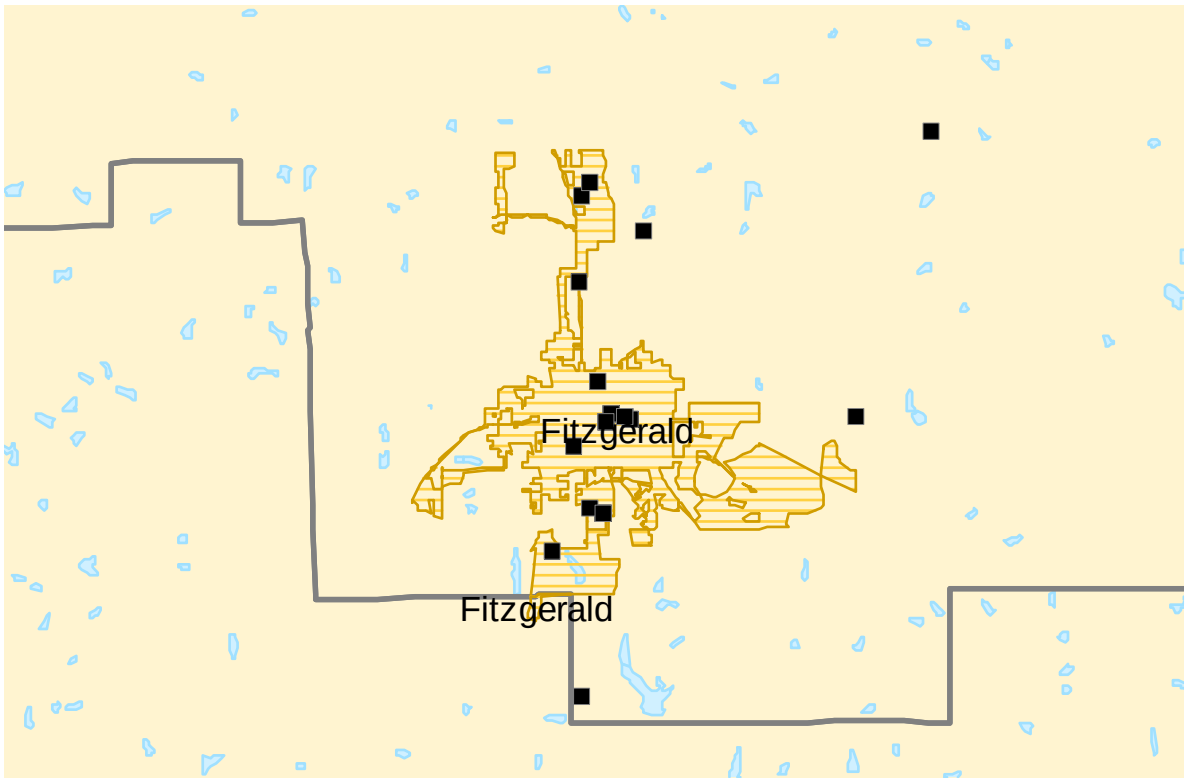
The unincorporated areas of Ben Hill County and the City of Fitzgerald are equally vulnerable to hurricanes and tropical storms. The following countywide and municipal ITOS maps graphically show that all critical facilities in Ben Hill County are located in areas with SLOSH hazard scores of zero.

Ben Hill County Critical Facility Inventory – SLOSH Hazard Scores

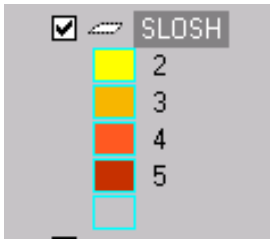


Countywide

SLOSH: 2 = low risk, 5 = high risk



Fitzgerald



SLOSH: 2 = low risk, 5 = high risk

G. General Summary Hurricanes/Tropical Storms.

Hurricanes and Tropical Storms can impact Ben Hill County at any time during the annual hurricane season. Property damages can run into the millions of dollars, including government infrastructure (washed out roads), flooding of homes and debris removal.

II. Tornadoes

A. Identify.

A tornado is a violently rotating column of air in contact with the ground. The air column can be seen when it contains condensation in the form of a cloud or when it contains surface dust and debris. Usually, a combination of both is present. When the column of air is aloft, it is called a funnel cloud. A waterspout is a tornado in contact with a water surface. The classic

"funnel" shape may not be present in exceptionally large tornadoes. The tornado may appear to be a large, turbulent cloud near the ground, or a large rain shaft.

Tornadoes usually develop from strong or severe thunderstorms. Most significant tornadoes have their origin within the right rear quadrant of the thunderstorm where a circulation develops at heights between 15,000 and 30,000 feet. A tornado or funnel cloud is observed when this circulation develops further downward toward the surface. Tornado development can also occur along the leading edge of a single thunderstorm or line of thunderstorms. While dangerous, such tornadoes are usually weak and short lived.

Tornadoes can topple buildings, roll mobile homes, uproot trees, hurl people and animals through the air for hundreds of yards, and fill the air with lethal wind- borne debris. Tornadoes do their destructive work through the combined action of their strong rotary winds and the impact of wind-borne debris.

Most tornadoes generate winds that are less than 120 miles per hour. Even though most buildings will be damaged to some extent by either the wind or windblown debris, there is nearly always a safe area, within a well constructed building, that will provide adequate shelter from tornado winds.

Tornadoes travel at an average speed of 30 miles per hour but speeds ranging from 0 to 70 miles per hour have been reported. Most tornadoes move from the southwest to the northeast but the direction may be erratic and subject to sudden change.

Forecasters and researchers use a wind damage scale created by Dr. T. Theodore Fujita to classify tornadoes and sometimes the damage done by other wind storms. The F - for Fujita - scale uses numbers from 0 through 5. The ratings are based on the amount and type of wind damage. The ratings are:

F0 - Gale tornado (40-72) **Light:** Damage to chimneys, tree branches, shallow-root trees, sign boards
F1 - Moderate tornado (73-112) **Moderate:** Lower limit is beginning of hurricane wind speed—surfaces peeled off roofs, mobile homes pushed off foundations or overturned, cars pushed off roads
F2 - Significant tornado (113-157) **Considerable:** Roofs torn off frame houses, mobile homes demolished, boxcars pushed over, large trees snapped or uprooted, light-object missiles generated
F3 - Severe tornado (158-206) **Severe:** Roofs and some walls torn off well-constructed houses, trains overturned, most trees in forest uprooted, cars lifted off the ground and thrown
F4 - Devastating tornado (207-260) **Devastating:** Well-constructed houses leveled, structures with weak foundations blown off some distance, cars thrown and large missiles generated
F5 - Incredible tornado (261-318) **Incredible:** Strong frame houses lifted off foundations and carried considerable distance to disintegrate, automobile-sized missiles fly through the air in excess of 100 yards, and trees debarked

In Ben Hill County, tornadoes are usually associated with thunderstorms in fast-moving cold fronts and with thunderstorms in hurricanes. The National Weather Service Doppler radar normally can detect the cyclonic movement of air in thunderstorms over Ben Hill County.

B. Tornadoes Profile.

The path width of a tornado averages about 200 yards and therefore can have a substantial impact on human life and property. Damage from the average tornado includes roof surfaces, mobile homes pushed off of their foundations, and automobiles pushed off of the road. More severe tornadoes can lift 300-ton objects and toss homes more than 300 feet. Since 1950, National Weather Service records show that Ben Hill County has experienced 11 reported tornadoes. Most of the tornadoes were associated with fast-moving cold fronts. In recent years, with the development of Doppler radar, Ben Hill County has been placed under numerous tornado warnings by the National Weather Service due to cyclonic activities detected by the radar in thunderstorms passing over Ben Hill County. The break-out of reported tornadoes in Ben Hill County since 1950 is:

--2 F2 (113 – 157 mph)
--7 F1 (73 – 112 mph)
--2 F0 (40 – 72 mph)

Both of the F2 tornadoes occurred in the 1960's.

Generally, the tornadoes associated with cold fronts passing through Ben Hill County are about ¼ to ½ mile wide and tend to travel about 10 miles on the ground. About 1% of the land area (5 square miles) of Ben Hill County (254 square miles) is impacted by any one tornado. As Ben Hill County develops, the probability of significant damage and loss of life grows.

See the National Climatic Data Center (NCDC) table in Appendix D for additional details regarding past hazard events in Ben Hill County. According to the Hazard Frequency Table, Appendix F, Ben Hill County has a 20% chance of a tornado annually.

C. Assets Exposed to Tornadoes.

Because tornadoes are a countywide hazard, all of Ben Hill County and the City of Fitzgerald are equally threatened by tornadoes. According to the ITOS Critical Facility Inventory database, Appendix A-II, the total replacement value of critical facilities in Ben Hill County is $119,879,572, and all critical facilities in Ben Hill County are located in areas with wind hazard scores of 2, a moderate risk, with 5 being the highest risk. All Ben Hill County buildings, infrastructure, and critical facilities are vulnerable to the indiscriminate path of a tornado. The National Weather Service advises that tornadoes strike at random, and therefore all areas within the community are equally at risk. Damage is a factor of both storm or wind severity and what is in the path of the tornado. An F4 tornado in a densely populated area will do enormous damage.

The characteristics of a structure can make it more or less vulnerable to tornado damage and its occupants more or less safe from injury if the building is hit. For example, mobile homes can be more easily damaged than permanent structures, buildings with crawl spaces are more susceptible to lift, and foundation and roof type can increase or decrease the structure's vulnerability. As for the potential impact of tornadoes on the total built community, GIS tax parcel data reveals that there are 11,030 structures with a total value of $927,026,750 exposed to tornadoes in Ben Hill County (see Worksheet 3A in Appendix D). The estimated Ben Hill County population exposed to tornadoes is 17,484.

D. Estimate Potential Losses to Tornadoes.

Predicting the potential losses from a tornado is similar to predicting where a tornado will touchdown. If the tornado is confined to a remote rural area the losses would be minimal; however, if the touchdown is a manufacturing plant, hospital, or downtown Fitzgerald, the damage to infrastructure and critical facilities would be in the millions of dollars. Depending on the route of a strong tornado, the potential loss could be significant in property damage and loss of life.

As noted, the total replacement value of critical facilities in Ben Hill County is $119,879,572, and all critical facilities in Ben Hill County are located in areas with wind hazard scores of 2, a low to moderate risk. GIS data shows that the value of the total build community exposed to tornadoes is $927,026,750. At this time, there are no known buildings, infrastructure or critical facilities to be located in the hazard zone requiring special mitigation strategies.

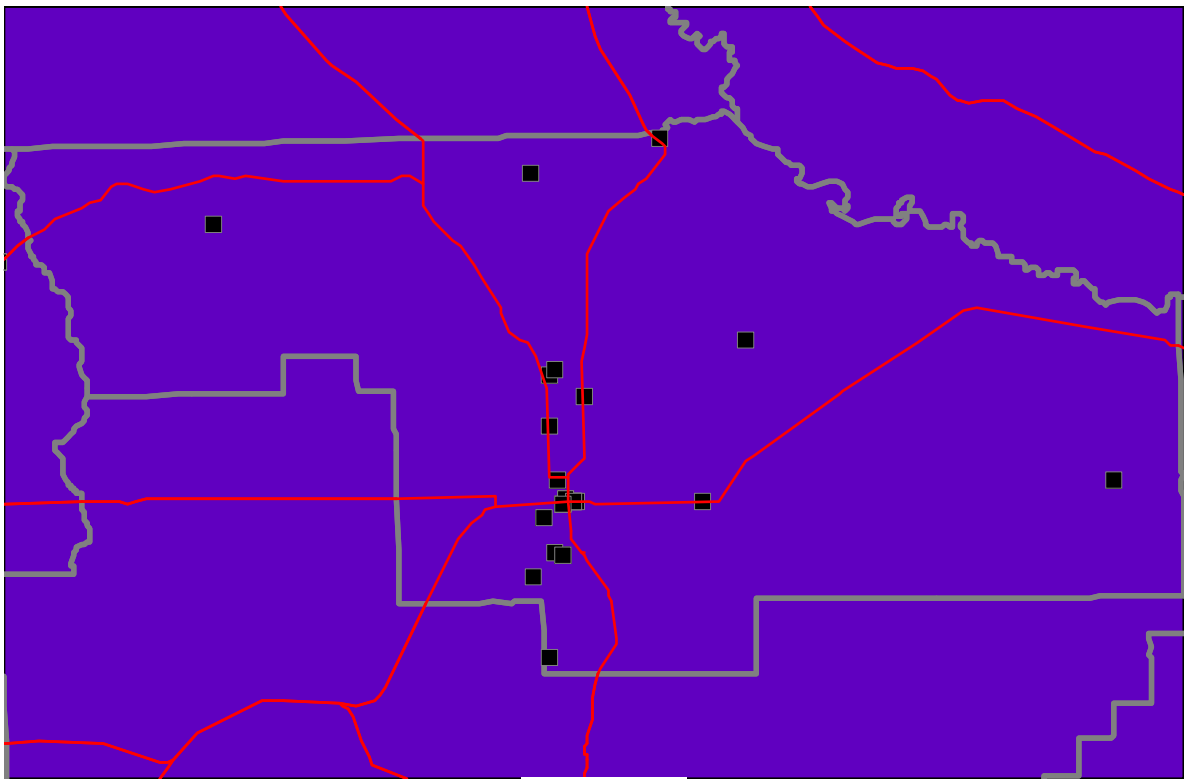
E. Land Use and Development Trends Related to Tornadoes.

The Ben Hill County and City of Fitzgerald land-use and development ordinances do not specifically address tornadoes. Ben Hill County design-wind for properly constructed and properly anchored manufactured homes is 80 mph sustained winds, while design-wind for stick-built homes is 100 mph. Because the tornado hazard zone is countywide, existing land use patterns and development trends will result in future development in the county that may be affected by tornadoes. The mitigation strategy in Chapter 4 includes action steps intended to reduce the possible adverse effect on such development.

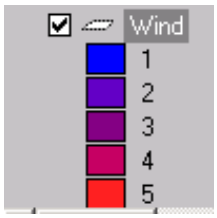
F. Multi-jurisdictional Differences.

All of Ben Hill County and the City of Fitzgerald are equally threatened by tornadoes. The following ITOS countywide and municipal maps graphically show that all structures in Ben Hill County are located in areas with wind hazard scores not exceeding 2. While wind zone maps are not indicative of where a tornado may strike, they are the most closely related maps to identify tornado risk available in the ITOS database. Regardless, tornadoes are a countywide hazard and can occur anywhere within the county.

Ben Hill County Critical Facility Inventory – Wind Hazard Scores

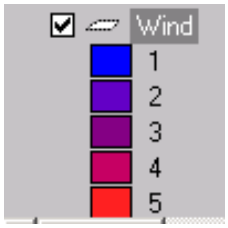


Countywide



Wind: 1 = low risk, 5 = high risk

Fitzgerald



Wind: 1 = low risk, 5 = high risk

G. General Summary of Tornadoes.

Tornadoes are a fact of life in Georgia; the question is not whether the event will happen, but when and where. Tornadoes tend to strike in somewhat random fashion, making the task of calculating a recurrence interval difficult. Depending on the severity of the tornado, damage can range from light damage to trees and roofs (Fujita Category F0) to destruction of well-built houses (Fujita Category F4 and F5). Mobile homes and houses with crawl spaces are more susceptible to lift and therefore at the greatest risk of damage. Tornadoes pose a real threat to Ben Hill County. The vulnerability grows as Ben Hill County becomes more urbanized. F1 and F2 tornado in the more developed areas of Ben Hill County could cause significant damage and loss of life. The Historic Recurrence Interval of tornadoes is greater than the Historic Recurrence Interval of hurricanes.

III. Flood

A. Flood Identify.

The overflow of rivers and streams onto normally dry lands due to severe storms or torrential rains is often a secondary impact of tropical storms or hurricanes. Among the most common factors affecting the extent of flooding are: topography, ground saturation, rainfall intensity and duration, soil type, drainage, drainage patterns, basin size, vegetative cover and development density/impervious surfaces. Flooding may occur slowly as the result of an extended rain or storm event, or as the result of a flash flood sometimes causing dam failure. Most floods occur because the ground is already saturated with moisture and cannot absorb any further runoff. Georgia's infamous red clay soil contributes to the problem. The clay soil has poor "percolation" capability, and quickly becomes saturated. Additional rainfall results in more runoff. In Ben Hill County and the City of Fitzgerald, localized flooding, which includes the overflow of streams and creeks designated as floodplains on the local FIRM maps, has caused the most damage to government infrastructure and to individual property. Considerable damage to roads with inadequate drainage is regularly experienced during periods of exceedingly heavy rain.

B. Flood Profile.

As noted, localized flooding due to the overflow of streams and creeks and lack of drainage capacity causes the most damage during heavy rainfall events. During Tropical Storms Earl (1998) and Jeanne (2004), most of the storm recovery costs were related to repairing government infrastructure due to damage from localized flooding. Many of the same roads were impacted by both storms.

In 1993, heavy rainfall produced flash flooding that washed away a section of road outside of Fitzgerald. In the city, a woman and child were swept from a street into a water-filled ditch by flood waters. Across Ben Hill County, major culvert damages were incurred, with repairs estimated at $300,000. In 1998, an intense Gulf storm produced 5 to 12 inches of rain across southwest Georgia, causing widespread flooding. In Ben Hill County, a man died when his vehicle overturned in the flood waters. In 2000, Ben Hill County EMA reported numerous county and state roads closed due to high water from five to six inches of rain overnight. Numerous streets in Fitzgerald were closed by high water, and several flooded downtown businesses reported water up to three feet deep.

In Fitzgerald, flooding along Turkey Creek, which winds through southeastern Ben Hill County and within the city limits of Fitzgerald, occurs during heavy rainfall events, particularly at the intersection of US Highways 129 and 107 (see Appendix A-III for a location map of Turkey Creek). The potential for future damage from the perennial flooding of Turkey Creek may require extensive flood control measures to be implemented along the creek and its tributaries.

See the National Climatic Data Center (NCDC) table in Appendix D for additional details regarding past hazard events in Ben Hill County. According to the Hazard Frequency Table, Appendix F, Ben Hill County has an 8% chance of a flood event annually.

C. Assets Exposed to Flood.

Throughout Ben Hill County and the City of Fitzgerald, the road system is the major asset exposed to localized flooding. Repetitive damage is experienced due to inadequate drainage capacity under these roads. Some homes are also threatened by lack of storm runoff capacity. No critical facilities are threatened by localized flooding.

According to the ITOS Critical Facility Inventory database, Appendix A-III, the total replacement value of critical facilities in Ben Hill County is $119,879,572. Twenty-eight critical facilities with a replacement value of $119,879,572 in Ben Hill County are located in areas with a flood hazard score of 0, no risk. By jurisdiction, the twenty-eight critical facilities are located as follows: Ben Hill County, eight facilities with replacement value of $29,516,905; Fitzgerald, twenty facilities with replacement value of $90,362,667. As for the potential impact of flooding on the total built community, GIS tax parcel data reveals that there are 1,477 structures with a total value of $94,212,607 located in flood hazard areas in Ben Hill County (see Worksheet 3A in Appendix D). The estimated Ben Hill County population living in the flood hazard areas is 4,585. According to the GIS tax parcel data and FEMA's 1998 FIRM maps, in the City of Fitzgerald there are 1,208 structures valued at $73,604,015 located within the 100 year floodplain, and 3,830 residents exposed to the risk of flooding. In unincorporated Ben Hill County, there are 239 structures valued at $20,608,592 located in the floodplain, and 755 residents.

D. Estimated Potential Loss to Flood.

Recent experience in Ben Hill County shows that localized flooding can cause extensive damage to roads and homes. The potential for loss caused by a historical river level high is not known and requires further study. As noted, twenty-eight critical facilities with a replacement value of $119,879,572 are located in areas with a flood hazard score of 0, no risk. See above for the location of the twenty eight critical facilities by jurisdiction. Also, as detailed above, GIS data shows that the value of the total built community exposed to flooding is $94,212,607. At this time, there are no known future buildings, infrastructure or critical facilities to be located in the hazard zone requiring special mitigation strategies.

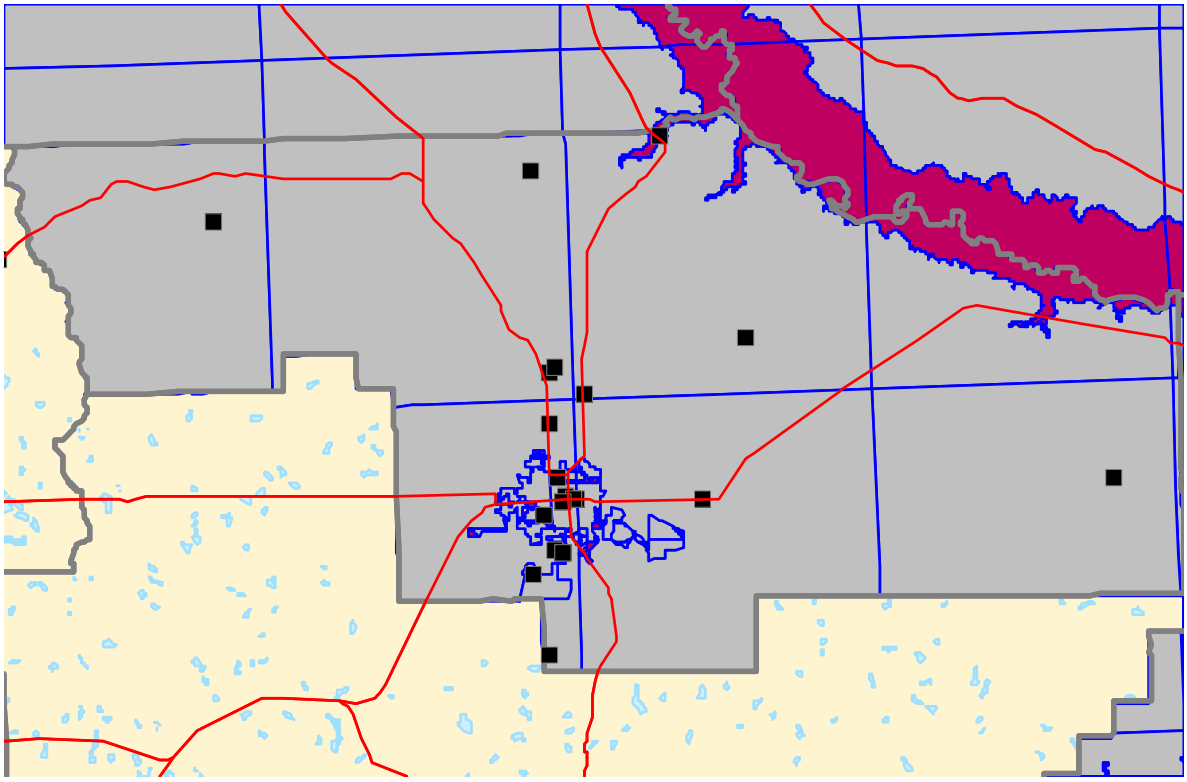
E. Land Use and Development Trends Related to Flood.

Local ordinances in Ben Hill County and City of Fitzgerald limit building activity in flood prone areas. The Planning Commission provides continuous review. Because portions of the total built community are exposed to flooding, existing land use patterns and development trends may result in future development in the county that may be affected by flood. The mitigation strategy in Chapter 4 includes action steps intended to reduce the possible adverse effect on such development.

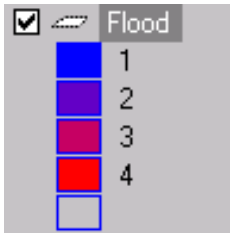
F. Multi-Jurisdictional Differences.

While the City of Fitzgerald is more vulnerable to localized flooding caused by lack of drainage capacity, both the city and unincorporated Ben Hill County are vulnerable to the overflow of streams and creeks. The following ITOS maps graphically show the degree of risk each jurisdiction faces from flooding.

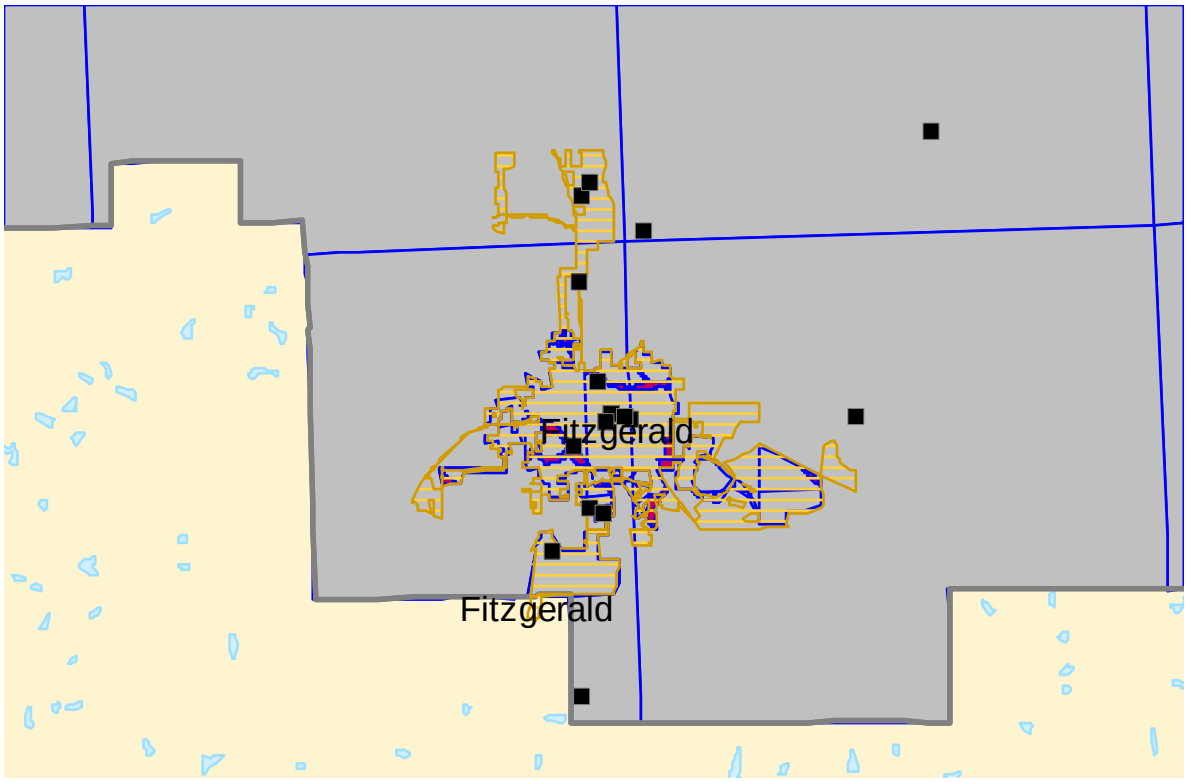
Ben Hill County Critical Facility Inventory – Flood Hazard Scores



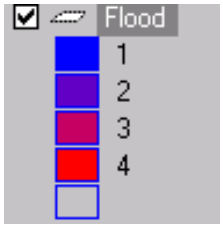
Countywide



Flood: 1 = low risk, 4 = high risk



Fitzgerald



Flood: 1 = low risk, 4 = high risk

G. General Summary Flood.

Localized flooding, which includes the overflow of streams and creeks in designated floodplains, is the major cause of repetitive damage in Ben Hill County and the City of Fitzgerald. Localized flooding occurs during and after heavy thunderstorms, hurricanes, tropical storms and extended periods of rainfall.

River flooding, on the other hand, is much less frequent and much less severe due to the past limitations on building in flood prone areas. However, a historical high water level might be a significant threat. More study is needed.

IV. Lightning

A. Lightning Identify.

Lightning, created by the discharge of electricity from cloud to ground, is associated with thunderstorms. The visual discharge is usually vertical from the cloud to ground, but can occur at angles from the storm, extending several miles from the storm.

B. Lightning Profile.

While the official National Climatic Data Center records show no significant lightning events in Ben Hill County since 1952, a study by Texas A&M University in 1991 determined that there are about 7,000 lightning strikes per year in south Georgia. This frequency of occurrence of lightning in south Georgia makes the risk to individuals and to property high.

In recent memory, about one to two individuals in the area each year are struck by lightning. The climate in Ben Hill County supports year-around outdoor activities, exposing many individuals, sometimes in large numbers, to the threat of lightning.

While there are no recorded events, lightning can damage buildings, residences, electronic equipment and electrical power transmissions.

See the National Climatic Data Center (NCDC) table in Appendix D for additional details regarding past hazard events in Ben Hill County. According to the Hazard Frequency Table, Appendix F, south Georgia has a 100 % chance of at least 7000 lightning strikes annually.

C. Assets Exposed to Lightning.

As a countywide non-spatially defined hazard, all critical facilities in Ben Hill County are exposed to lightning, as well as individuals outside and electrical equipment. The total replacement value of critical facilities in Ben Hill County is $119,879,572. As for the potential impact of lightning on the total built community, GIS tax parcel data reveals that there are 11,030 structures with a total value of $927,026,750 exposed to lightning in Ben Hill County (see Worksheet 3A in Appendix D). The estimated Ben Hill County population exposed to lightning is 17,484.

D. Estimated Potential Loss to Lightning.

The risk of loss-of-life of one to two individuals each year and the potential for injury to a large number of individuals in outdoor gatherings are relatively high. As noted, the total replacement value of critical facilities in Ben Hill County is $119,879,572. GIS data shows that the value of the total built community exposed to lightning is $927,026,750. At this time, there are no known buildings, infrastructure, or critical facilities to be located in the hazard zone requiring special mitigation strategies.

E. Land Use and Development Trends Related to Lightning.

Ben Hill County and City of Fitzgerald land-use and development ordinances do not address lightning. Because the lightning hazard zone is countywide, existing land use patterns and development trends will result in future development in the county that may be affected by these hazards. The mitigation strategy in Chapter 4 includes action steps intended to reduce the possible adverse effect on such development.

F. Multi-Jurisdictional Lightning.

Lightning equally impacts both jurisdictions in Ben Hill County, but normally not simultaneously. Appendix A-IV includes ITOS maps of Ben Hill County and the City of Fitzgerald with the location of their critical facilities, and an ITOS report listing all critical facilities.

G. General Summary Lightning.

Lightning can be a killer in Ben Hill County and is very dangerous to those individuals outdoors during or near thunderstorms. The high frequency of lightning strikes in Ben Hill County increases the risk of individuals being struck and property being damaged.

V. Wildfire

A. Wildfire Identify.

Wildfire is an uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures. Naturally occurring and non-native species of grasses, brush, and trees fuel the spread of wildfires. Of its 254 square miles, Ben Hill County has about 95% forested land. Wildland-urban-interface occurs when homes come into contact with vegetative fuels for a wildfire to consume.

B. Wildfire Profile.

Although the National Climatic Data Center records show no wildfire events, Georgia Forestry Commission records show that over the past five years, Ben Hill County has had a total of 223 wildfires (Appendix A-V). Ben Hill County land-base is primarily considered to be a heavy fuel, referred to as Southern Rough Fuel. There are many areas in Ben Hill County where wildfire control efforts may be hampered due to the homes in and around the wildland area. Based on a 3-year average, Ben Hill County experiences about 22 Critical Fire Weather Days/year. Critical Fire Weather is a set of weather conditions, usually a combination of low relative humidity and wind, whose effects on fire behavior make wildfire control difficult and threaten firefighter safety.

A news release dated April 4, 2005 from the Georgia Forestry Commission (GFC) states that the cause of almost half the wildfires in Georgia is from careless debris-burning.

Considerable fire control assets and good citizen-public safety emergency communications help control the spread and threat of wildfires in Ben Hill County.

See the National Climatic Data Center (NCDC) table in Appendix D for additional details regarding past hazard events in Ben Hill County. According to the Hazard Frequency Table, Appendix F, Ben Hill County has a 100% chance of at least 45 wildfires annually.

C. Assets Exposed to Wildfire.

Most of Ben Hill County is subject to wildfires, except the parts of the "inner city" of City of Fitzgerald. See the ITOS Critical Facility Inventory database, Appendix A-V, for a list of 3 critical facilities valued at $483,000 located in unincorporated areas of the county with a wildfire hazard score of 1, a low risk. The remaining critical facilities are located in areas with scores of zero. As for the potential impact of wildfires on the total built community, GIS tax parcel data reveals that countywide there are 5,146 structures with a total value of $276,729,408 exposed to wildfires in Ben Hill County (see Worksheet 3A in Appendix D). These totals can be broken down by jurisdiction: Fitzgerald, 652 structures valued at $75,059,429 and unincorporated Ben Hill County, 4,494 structures valued at $201,669,979. The estimated Ben Hill County population exposed to wildfires is 9,422, with 2,211 residing in Fitzgerald and 7,211 in unincorporated Ben Hill County.

D. Estimated Potential Losses to Wildfire.

Significant assets, in terms of homes and lumber, are at risk. While only three critical facilities are exposed to a low risk of wildfire, GIS data shows that the value of the total built community exposed to wildfire is $276,729,408. See above for a breakdown of this total by jurisdiction. At this time, there are no known buildings, infrastructure or critical facilities to be located in the hazard zoning requiring special mitigation strategies.

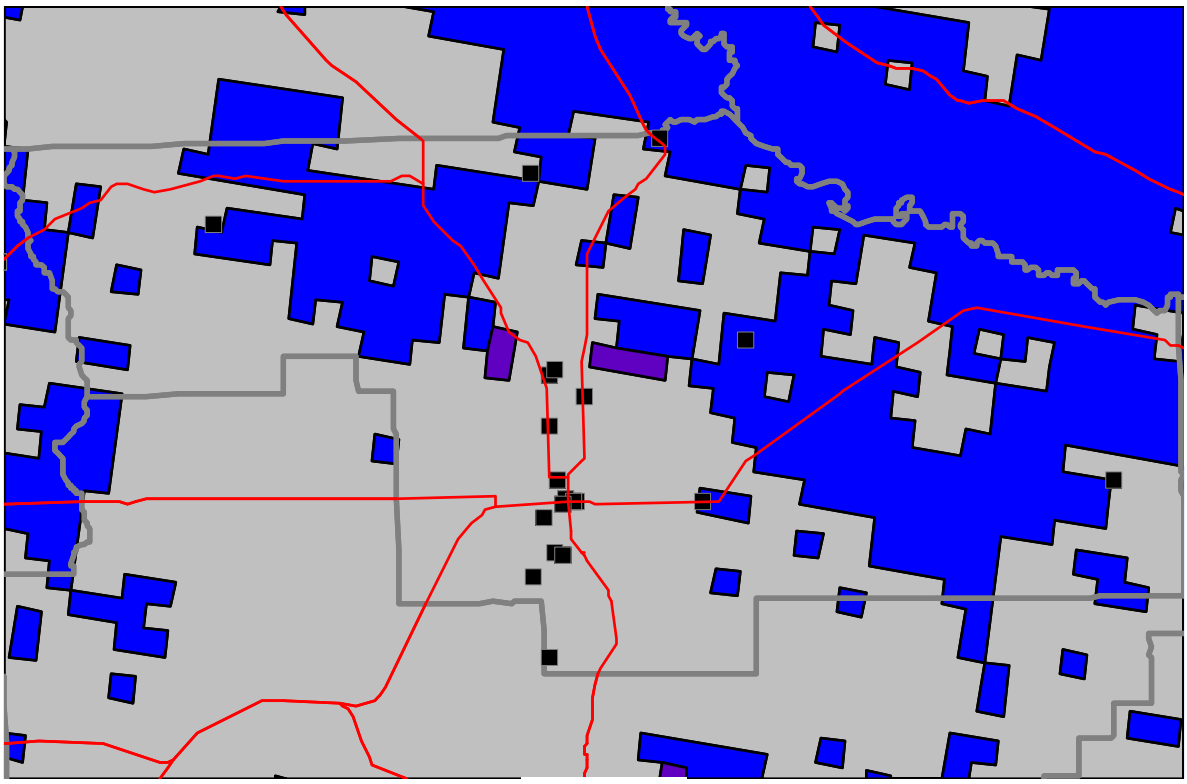
E. Land Use and Development Trends Related to Wildfire.

At this time, Ben Hill County and City of Fitzgerald land-use and development ordinances do not address wildfires. Existing land use patterns and development trends will result in future development in the rural/urban interface area that may be affected by wildfire. The mitigation strategy in Chapter 4 includes action steps intended to reduce the possible adverse effect on such development.

F. Multi-Jurisdictional Wildfire.

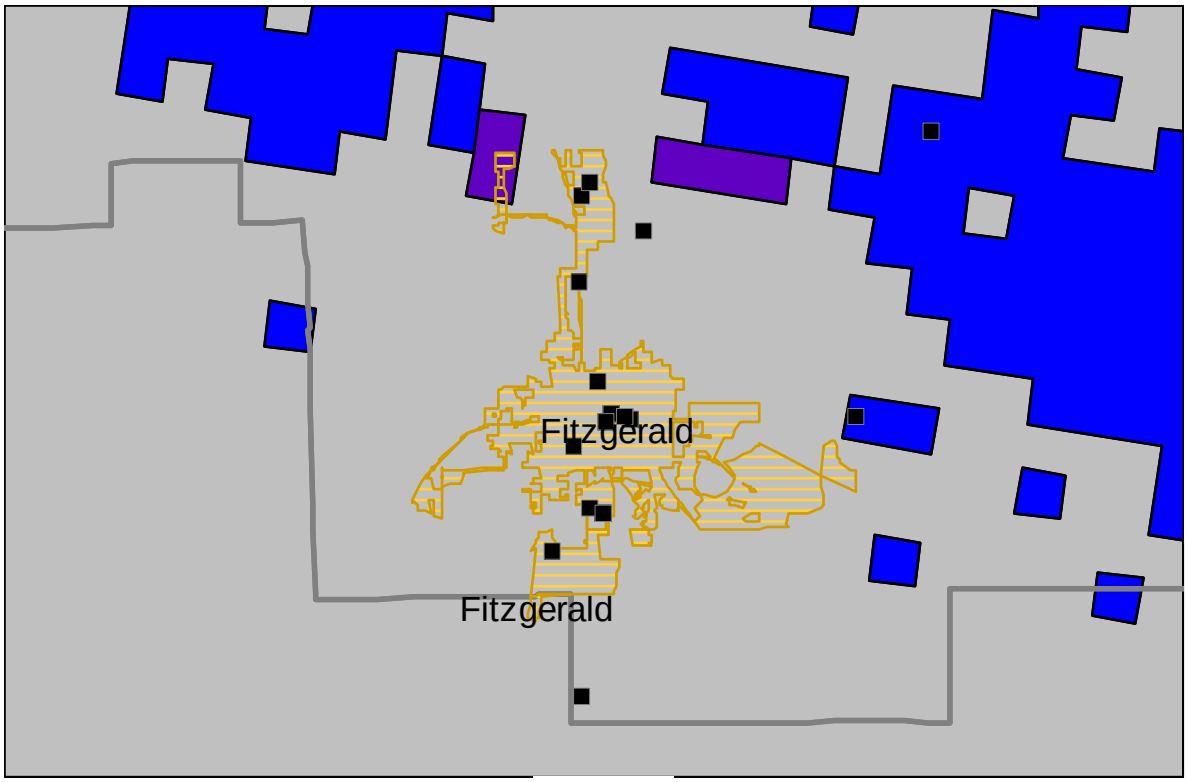
The following ITOS maps graphically show the risk of wildfire in the unincorporated areas of the county and in the city. While the unincorporated areas of Ben Hill County are at risk, most of the City of Fitzgerald, except for the extreme northwest area, is outside the hazard zone.

Ben Hill County Critical Facility Inventory – Wildfire Hazard Scores

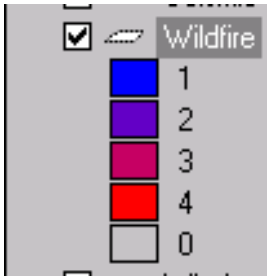


Countywide

Wildfire: 1 = low risk, 4 = high risk



Fitzgerald



Wildfire: 1 = low risk, 4 = high risk

G. General Summary Wildfire.

Ben Hill County is heavily forested and experiences a significant number of wild fires each year. Moreover, Ben Hill County has a large number of Critical Fire Weather days per year making control of a wildfire difficult.

VI. Extreme Heat

A. Extreme Heat Identify.

Outside temperatures during the summer months in south Georgia will often exceed 100 degrees, and combined with 100% humidity levels, can be deadly, particularly for the elderly. On such days, weather forecasters often combine the temperature and humidity levels to forecast a "heat index" which can often reach as high as 110 degrees. Although statistical information regarding high heat and humidity is not readily available to determine the extent of the threat and to forecast conditions when individuals are at risk, a heat index greater than 100 is generally considered to be a health risk.

B. Extreme Heat Profile.

Since records of extreme heat events are no maintained by the NCDC, there is insufficient historic data available to accurately determine the number of past events and to accurately project the probability of future occurrences. However, using local estimated data in the Hazard Frequency Table, Appendix F, there is a 100 % chance of two extreme heat events annually in Ben Hill County.

See the National Climatic Data Center (NCDC) table in Appendix D for additional details regarding past hazard events in Ben Hill County.

C. Assets Exposed to Extreme Heat.

The most vulnerable population to extreme heat is the elderly, chronically ill, and the homeless without air conditioning. As noted, the total replacement of value of critical facilities in Ben Hill County is $119,879,572. GIS data shows that the value of the total built community is $927,026,750. However, as a countywide non-spatially defined hazard, extreme heat affects people more than structures. While all 17,484 residents of Ben Hill County are at risk (see Worksheet 3A in Appendix D), the elderly and very low income populations are most likely to not have air conditioning, making them the most vulnerable to extreme heat and high humidity. According to the 2000 Census, 2,202 persons (12.6%) in Ben Hill County are aged 65 or higher and 3,531 individuals (20.2%) live below the poverty level.

D. Estimated Potential Losses to Extreme Heat.

Data needed to estimate the potential loss of life or injury is not readily available. As noted, the total replacement value of critical facilities in Ben Hill County is $119,879,572, and GIS data shows that the value of the total built community exposed to extreme heat is $927,026,750. Census data shows that there are 2,202 persons in Ben Hill County aged 65 or higher and 3,531 residents living below the poverty level who would be considered at high risk. At this time, there are no known buildings, infrastructure or critical facilities to be located in the hazard zone requiring special mitigation strategies.

E. Land Use and Development Trends Related to Extreme Heat.

Ben Hill County and City of Fitzgerald land-use and development ordinances do not address extreme heat and high humidity. Because the hazard zone is countywide, existing land use patterns and development trends will result in future development in the county that may be affected by extreme heat. The mitigation strategy in Chapter 4 includes action steps intended to reduce the possible adverse effect on such development.

F. Multi-Jurisdictional Extreme Heat.

The unincorporated areas of Ben Hill County and City of Fitzgerald are equally vulnerable to extreme heat. Appendix A-IV includes ITOS maps of Ben Hill County and the municipalities with the location of their critical facilities, and an ITOS report listing all critical facilities.

G. General Summary Extreme Heat.

Extreme heat and high humidity occur regularly in Ben Hill County during the summer months. The number of days is not readily available when vulnerable populations and those working outside should take precautions. Extreme heat and high humidity more adversely affect the vulnerable population without air conditioning.

VII. Drought

A. Drought Identify.

A drought is a prolonged period without rain, particularly during the planting and growing season in agricultural areas. It can range from two weeks to six months or more and affects water availability and quality. Drought conditions for the purposes of this plan deal only with those drought conditions that could cause disruption to public and private underground water sources for domestic use. Though drought conditions can severely impact the agriculture economy of Ben Hill County, drought conditions affecting agriculture are not addressed in this plan because of a different source of disaster assistance through the state and federal departments of agriculture. The primary source of domestic water in Ben Hill County comes from underground sources. The Floridian Aquifer provides a significant amount of domestic water to the public in Ben Hill County. Water levels in the aquifer vary depending on the amount of recharge. Thus, during long periods of drought, water levels may drop below the levels of the wells, causing disruption in the water supply.

B. Drought Profile.

Insufficient data and analysis are readily available to determine the degree of domestic water shortages in Ben Hill County caused by a long-term drought and continued high usage rates of the underground water supply. Since it is usually difficult to recognize the occurrence of drought before being in the middle of one, drought analysis is more subjective, because droughts do not occur spontaneously. Droughts evolve over time as certain conditions are

met and are spread over a large geographical area. Drought severity depends on its duration, intensity, geographic extent, and the regional water supply demands made by human activities. In 2000, several domestic wells (single home wells and wells serving several homes) went dry, leaving these homes without their normal water supply. Concern was expressed regarding other domestic wells serving larger groups of homes.

According to the National Climatic Data Center, a drought lasting only 4 weeks in 1997 caused an estimated $66.5 million in crop damage statewide, with $46.5 million in damage occurring in a twenty-five county region in south Georgia, including Ben Hill County (see Appendix A-VII). Also included in Appendix A-VII is the historic record of the Palmer Index, a measurement of drought, for south central Georgia covering the period 1895 to 2004. Negative PI numbers indicate very severe drought. In 1954, a three year drought with a peak PI of almost -5.0 (very severe) was experienced in south central Georgia. However, insufficient data and analysis are available from this period to accurately project such a recurrence in the future.

See the National Climatic Data Center (NCDC) table in Appendix D for additional details regarding past hazard events in Ben Hill County. According to the Hazard Frequency Table, Appendix F, there is a 2 % chance of a drought event in Ben Hill County each year.

C. Assets Exposed to Drought.

Practically every home and business in Ben Hill County including City of Fitzgerald receives its domestic water from underground sources. As noted previously, the replacement value of critical facilities in Ben Hill County is $119,879,572, and GIS data shows that the value of the total built community exposed to drought is $927,026,750. However, as a countywide non-spatially defined hazard, drought affects people and the public health more than structures. Therefore all 17,484 residents of the county are vulnerable (see Worksheet 3A in Appendix D).

D. Estimated Potential Losses to Drought.

Drought affects water levels for use by industry, agriculture, and individual consumers. Although Ben Hill County should not sustain structural damages associated with drought, agricultural crop damages and the farmers' loss of revenue has an undetermined domino effect, resulting in economic and environmental impacts and personal hardships to the rest of the community, rather than loss of life or immediate destruction of property. Due to the lack of analysis, the potential loss is unknown. As noted, the total replacement value of critical facilities in Ben Hill County is $119,879,572, and GIS data shows that the value of the total built community exposed to drought is $927,026,750. Data shows that there are 17,484 residents vulnerable. At this time, there are no known buildings, infrastructure or critical facilities to be located in the hazard zone requiring special mitigation strategies.

E. Land Use and Development Trends Related to Drought.

Ben Hill County and City of Fitzgerald land-use and development ordinances do not address the assurance of domestic water sources. Because the drought hazard zone is countywide, existing land use patterns and development trends will result in future development in the county that may be affected by drought. The mitigation strategy in Chapter 4 includes action steps intended to reduce the possible adverse effect on such development.

F. Multi-Jurisdictional Drought.

Ben Hill County and the City of Fitzgerald are equally vulnerable to drought. See Appendix A-IV for ITOS maps of Ben Hill County and the municipalities with the location of their critical facilities, and an ITOS report listing all critical facilities.

G. General Summary Drought.

Ben Hill County is currently blessed with an abundance of underground water. As Ben Hill County grows and demands on the underground sources of water continue to grow, in Ben Hill County and outside Ben Hill County, the supply of underground water from which the county can draw its domestic water will diminish. Extended periods of drought could jeopardize the health and welfare of Ben Hill County citizens and disrupt ordinary commerce.