Coastal and Riverine Erosion

Coastal Erosion

Coastal erosion is the landward displacement of the shoreline caused by the forces of wave and currents. The effects of coastal erosion can be from natural causes and/or human activities. The gradual process of coastal erosion results naturally from the very slow rise of the sea level. Severe coastal erosion can occur over a very short period of time the county's coast is impacted by hurricanes, tropical storms and other weather systems. Also, some coast erosion may be caused by poorly thought-out coastal development.

Photo Image: WCTV

A critical coastal erosion area is a segment of the shoreline where natural processes or human activity have caused or contributed to erosion and recession of the beach or dune system to such a degree that upland development, recreational interests, wildlife habitat, or important cultural resources are threatened or lost. Critical erosion areas may also include peripheral segments or gaps between identified critical erosion areas which although they may be stable or slightly erosional now, their inclusion is necessary for continuity of management of the coastal system or for the design integrity of adjacent beach management projects.

Coastal Erosion (Beach and Dune) Occurrences *(summary data will be from two documents from the Florida Department of Environmental Protection (FDEP), Division of Water Resource Management pre and post-Hurricane Michael).*

1. Critically Eroded Beaches in Florida, December 2017
2. Hurricane Michael Post-Storm Beach Conditions and Coastal Impact Report, revised April 2019

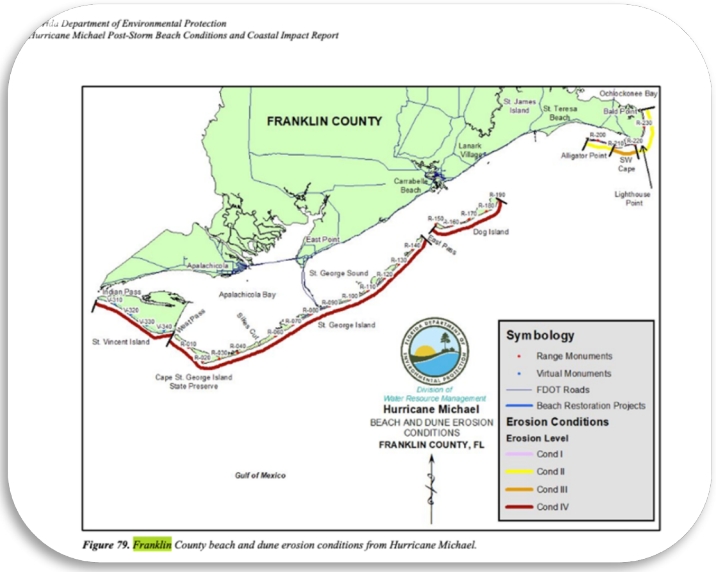
There are six critically eroded beach areas (11.1 miles), nine non-critically eroded beach areas (19.7 miles), and one non-critically eroded inlet shoreline area (0.5 mile) in Franklin County. St. Vincent Island has a 3.2-mile long non-critically eroded area along its most gulfward protruding midsection. To the east, a 0.9-mile segment of St. Vincent Island is critically eroded into the maritime forest, which has resulted in the loss of beach wildlife habitat.

Severe erosion exists at Cape St. George on Little St. George Island, which has resulted in the loss of the historic pre-Civil War lighthouse. This critically eroded area extends along a 0.6-mile length of shoreline and is adjoined at both ends by a 0.7-mile non-critically eroded segment to the west and a 0.3-mile non-critically eroded segment to the east. The west end of the historical length of St. George Island west of Bob Sikes Cut is non-critically eroded for 3.3 miles. Both interior shorelines of Bob Sikes Cut also have non-critical erosion for 0.5 mile. East of Bob Sikes Cut, the St. George Island Plantation is designated non-critically eroded for 3.3 miles. After Hurricane Dennis (2005) severely impacted Dr. Julian G. Bruce St. George Island State Park, the entire developed stretch of the park was designated critically eroded for 4.5 miles due to the impact to recreational interests and park infrastructure. The undeveloped eastern 3.8 miles is considered non-critically eroded.

Most of Dog Island is eroded, including the western 2.6 miles which is non-critically eroded. To the east, a 3.6-mile segment is designated critically eroded. The undeveloped historic west end of Alligator Point is severely eroded for 0.4 mile and designated non- critically eroded. The eastern end of Alligator Peninsula between the Southwest Cape and

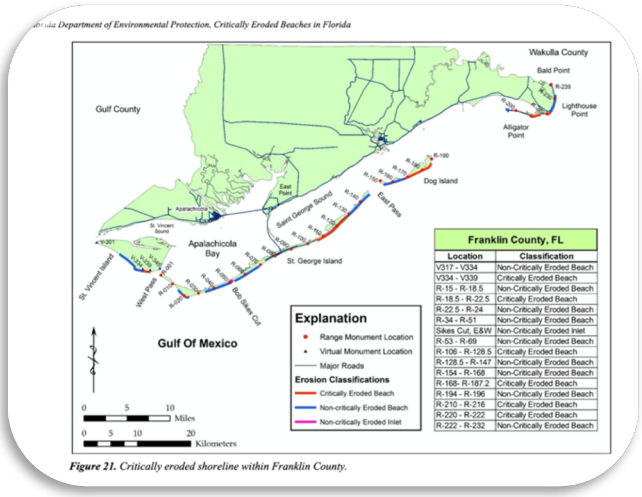
Lighthouse Point is designated critically eroded for 1.1 miles, where past storms have destroyed and continue to threaten private development and a county road. The southeastern end of St. James Island is critically eroded, extending north from Lighthouse Point for 0.4 mile, threatening residential development. Further north from Lighthouse Point, a non-critically eroded area extends for 2.1 miles.

Figure 4.20 - FDEP, Critically Eroded Shoreline in Franklin County



Source: FDEP

Figure 4.21 – Hurricane Michael Post-Storm Beach Conditions and Coastal Impact Report



Source: FDEP

Storm Effects and Erosion Conditions

The storm tides of Hurricane Michael in Franklin County generally ranged from 8 to 12 feet above sea level. The storm surge caused extensive washover fans into the dune field and maritime forest of St. Vincent Island generally between DEP virtual stations. All along St. Vincent Island's gulf beach are storm tide runout channels that carried the ebbing flood waters back across the beach. A large developing cuspate foreland at the southwestern point of St. Vincent Island experienced substantial growth, enclosing a now entrapped lagoon. This lagoon is the seventh and most seaward of a progression of coastal lakes formed in likely similar manner. Immediately offshore, two subaerial shoals have substantially eroded with only a fragment of one now exposed. The sediment of these shoals may have contributed to the avulsive growth of the cuspate foreland.

The length of the St. George Island barrier complex experienced storm surge flooding and substantial overwash deposits. Extensive washover fans exist on Little St. George Island. As was seen along St. Vincent Island, the Cape St. George area has several storm tide runout channels that carried the ebbing flood waters back across the beach. Hurricane Michael's storm surge caused extensive washover fans across the island. The western jetty at the cut is separated from the island at high tide. Substantial shoaling appears to have occurred within the inlet, with substantial beach material having been removed from the St. George Plantation east of Sikes Cut. At Sikes Cut, the eastern jetty was breached, separating it from St. George Island. The eastern and western jetty breaches had previously occurred during Hurricanes Elena and Kate in 1985. Along St. Vincent Island, Little St. George Island, and St. George Island, major beach and dune erosion (Condition IV) was sustained. Severe dune erosion was sustained at Bob Sikes Cut . Along St. George Island Plantation), the dunes retreated as much as 50 feet (see bottom photo at the right).

Table 4.36 provides erosion volumes in cubic yards for Franklin County beaches fronting on the Gulf of Mexico. Four segments of shoreline are tabulated. The erosion volumes were obtained from a post-storm U.S. Army Corps of Engineers LIDAR survey compared to the latest pre-storm survey for all DEP monument locations above Mean Low Water (MLW). In much of Franklin County, the frontal dunes were essentially removed, and large amounts of eroded material were deposited upland. Therefore, calculations were made of the total volume eroded as well as the volume eroded with this upland deposition included, or the net erosion volume. Pre-storm data was not available for St. Vincent Island or Dog Island, but computations were made of the rest of the gulf front shoreline on the coastal barriers. Computations showed a total erosion volume of approximately two million cubic yards of beach and dune sand for the remainder of the county, of which approximately one-half were lost from the system, and therefore, a net erosion volume of approximately one million cubic yards was calculated above MLW.

Figure 83. *Major beach and dune erosion at Bob Sikes Cut at R52, St. George Island.*

Figure 84. *Major dune erosion at R72, St. George Island.*

Table 4.36 – Erosion Volumes above Mean Low Water

Table 6. Franklin County erosion volumes above Mean Low Water (MLW).

Location	DEP Monuments	Average Erosion cy/ft	Total Erosion Volume (cy)	Average Net cy/ft	Net Erosion
Little St. George Island	R1-R51	-11.9	-541,967	-4.7	-182,537
St. George Island	R52-R149	-13.5	-1,391,838	-9.3	-955,395
Alligator Pt. to Lighthouse Pt.	R194-R220	-4.6	-122,757	0.5	13,603
Lighthouse Pt. to Bald Pt.	R221-R239	-2.6	-48,031	3.6	72,015
Total	**R1-R239**		**-2,104,594**		**-1,052,315**

Source: FDEP

The erosion conditions moderated along the coastal barriers further to the east. Alligator Peninsula between Alligator Point and the Southwest Cape sustained minor beach and dune erosion. Along the barrier peninsula east of the Southwest Cape between and, moderate beach and dune erosion was sustained. From Lighthouse Point northward to Bald Point, minor beach and dune erosion was sustained. Portions of the Alligator Point to Bald Point barrier complex were completely inundated by the storm surge. Sand was sporadically deposited in washover fans between the dune and the road between Lighthouse Point and Bald Point. The dune was leveled, with sand being deposited on and across the road.

Impacts from Hurricane Michael

Table 4.37 – Major Structural Damage

County	# Single Family Dwellings Damaged	# Multi Family Dwellings (1) Damaged	# of Other Major Structures (2) Damaged	Total # Damaged (3)
Franklin	160	3	2	165

1. Multi-family dwellings include condominiums, townhouses, apartments, hotels, and motels.
2. Other major structures include: commercial buildings (restaurants, stores, beach bars, etc.), recreational buildings and non-habitable major structures (i.e., piers, pools, pavilions and parking lots).
3. Not included in this summary are: minor structures (i.e., walkways, decks, driveways, patios, etc.), coastal and shore protection structures (i.e., seawalls, revetments, sills, groins, jetties), minor damage to major structures, structures located inland of the coastal building zone, or structures with hydrostatic flooding damage caused by the storm surge or storm water runoff.

Table 4.38 - Coastal Armoring Damage

County	Armoring (1) Damage in Feet
Franklin	4,670

1. Coastal Armoring – includes seawalls, bulkheads, retaining walls, revetments, sills, or other rigid coastal protection structures.

Riverine Erosion

Riverine erosion is the long-term process whereby riverbanks and riverbeds are worn away. This process is best described as a river's tendency for constant course alteration, shape and depth change, and the balance between the water sediment transport capacity and the sediment supply. Riverine erosion has many consequences including land and development loss. When stormwater flows exceed channel capacity, water will overtop channel banks and spread out as floods. The loss of soils due to riverine erosion under paved roads, bridge abutments and approaches, bridge pilings and other structural pilings, can cause structural failures that endanger public safety. Washouts of boat ramps can restrict access for emergency personnel. Riverine erosion can increase the debris flow of trees and structures like docks that can pile up against structures in the floodway, increasing stresses on the pilings and possibly contributing to failures.

Photo source: https://www.floridasforgottencoast.com/event/apalachicola-river

Figure 4.22 Apalachicola River
(identified by the green circle dots in the western portion of the county down to the Apalachicola Bay)

The Apalachicola River is an alluvial river characteristically has a variable seasonal flow with substantial annual flooding, and a heavy sediment load. The continuing erosion and depositional processes acting within the Apalachicola River causes the river channel to be in a constant state of change, even during low flow. The deposition and erosion of material in the river eventually creates meanders, which widen the river valley, decrease slope, slowing down the water velocity, allowing more sediments to be deposited, thereby continuing the movement of the river channel laterally. During high flow, the river not only erodes and deposits sediments on the floodplain but is capable of creating new channels by cutting off meanders or blocking the mouths of tributaries forcing them to create new channels. As the river adjusts and stabilizes, floodplain features are formed which can be discerned by topography and soil characteristic.

The New River flows through Tates Hell Swamp, a vast forested plain in Franklin County. The river is very darkly stained, making it one the darkest and blackest of the blackwater streams. After its confluence with the Crooked River, the stream becomes wider and estuarine in character and is called the Carrabelle River. The Crooked River is a waterway that connects the tidal estuary of the Ochlockonee River to a junction with the tidal Carrabelle River.

Apalachicola River and Bay Surface Water Improvement and Management Plan, NWFWMD, November 2017

Specifics regarding Riparian Buffers from the plan

Riparian Buffers in the Apalachicola River
A riparian buffer zone is an overlay that protects an adjoining waterbody from effects of adjacent development, such as runoff, NPS pollution, **erosion**, and sedimentation. A buffer zone in this context refers to an area along the shoreline that is maintained in or restored to generally natural vegetation and habitat. In this condition, an intact buffer zone helps to simultaneously achieve three important goals: water quality protection, shoreline stability, and fish and wildlife habitat. Associated with these are other benefits, including aesthetic improvements and public access and recreation. These benefits are achievable for riparian areas along all types of waterbodies: stream/riverine, estuarine, lacustrine, and wetlands, and karst features.

Historical Riverine Erosion Occurrences

According to the International Journal of Environmental Sciences & Natural Resources, Long Term Hydrological Changes in the Apalachicola River, Volume 19 Issue 5, June 2019

The study pointed out that the lowest decline in the Apalachicola River stages of low flows could be observed at lowermost parts of the river very close to the Apalachicola Bay during drought conditions. They also deduced that water levels had declined more due to channel erosion (i.e. the erosion process that occurs within the channel within both banks; the erosion can be either erosion on the bank or lowering of the stream bed) as compared to reduced flows in the upstream parts of the river.

Specifics on how much erosion has occurred was not noted in the study.

Additional Occurrence Data

There has been documented riverine erosion on the Apalachicola River confirmed by the Corps of Engineers along the Liberty County side of the river. One property owner noted that he has lost up to 20 feet off the riverbank from riverine erosion on his property. The cause of the erosion is due to the natural meander of the river however, it was exacerbated when the Corps began placing dredged material on the opposite of the river. The disposal of the dredged material pushed the current against the Estiffanulga Park side and increased the velocity, so the force of the bank is more erosive. In addition, high and low water conditions will also affect the erosion rate.

Risk and Vulnerability Assessment

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

Franklin County's coastline's is very vulnerable to coastal erosion as noted in Figure 4.21, the non-critical and critical eroded beach areas. The residents that live in close proximity to the six critically eroded beach areas (11.1 miles), nine non-critically eroded beach areas (19.7 miles), and one non-critically eroded inlet shoreline area (0.5 mile) in Franklin County. St. Vincent Island has a 3.2-mile long non-critically eroded area along its most gulfward protruding midsection. To the east, a 0.9-mile segment of St. Vincent Island is critically eroded into the maritime forest, which has resulted in the loss of beach wildlife habitat are at greatest risk.
The vulnerability of riverine erosion along the Apalachicola River does occur with continuing erosion and depositional processes acting within the river causing the river channel to be in a constant state of change, even during low flow.

Vulnerability for Franklin County's Population

The county population that lives along the coastal areas (i.e. Carrabelle, Eastpoint, Lanark Village, St. Teresa, Alligator Point, Apalachicola, and particularly the residents on St. George Island, and a few residents from Dog Island) can have some type of vulnerability to coastal erosion especially after a significant hurricane event like Hurricane Michael and the erosion impact from the storm surge, flood waters and high winds.

There is some vulnerability to the county's population that live near or close by the Apalachicola River, the Ochlockonee River, or the Carrabelle River, however, the percentage of the county population affected would be relatively small.

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

The vulnerability to risk to coastal erosion

The vulnerability risk to riverine erosion for the County's structures, facilities and infrastructure is considered low vulnerability. The vulnerability would increase for the homeowners that have property and structures located near the riverbeds and suffer from a historical river flooding elevation event that washes out the structures. Riverine erosion can increase the debris flow of trees and structures like docks that can pile up against structures in the floodway, increasing stress on the piling and possible contributing to failures.

Summary details for coastal and riverine erosion events:

Probability of Future Occurrences	The probability for coastal erosion is high (at least 1 occurrence every year). The probability for riverine erosion is low (at least 1 occurrence every 10 years).
Geographic Area	The coastal areas (i.e. Carrabelle, Eastpoint, Lanark Village, St. Teresa, Alligator Point, Apalachicola, Cape St. George on little St. George Island, Dog Island, St. James Island and St. Vincent would experience critical coastal erosion. The riverine erosion would be on the Apalachicola River, the Ochlockonee River, or the Carrabelle River.
Extent	Coastal Erosion There are six critically eroded beach areas (11.1 miles), nine non-critically eroded beach areas (19.7 miles), and one non-critically eroded inlet shoreline area (0.5 mile) in Franklin County. St. Vincent Island has a 3.2-mile long non-critically eroded area along its most gulfward protruding midsection. To the east, a 0.9-mile segment of St. Vincent Island is critically eroded into the maritime forest, which has resulted in the loss of beach wildlife habitat. Severe erosion exists at Cape St. George on Little St. George Island, which has resulted in the loss of the historic pre-Civil War lighthouse. This critically eroded area extends along a 0.6-mile length of shoreline and is adjoined at both ends by a 0.7-mile non-critically eroded segment to the west and a 0.3-mile non-critically eroded segment to the east. Most of Dog Island is eroded to the east, a 3.6-mile segment is designated critically eroded. The undeveloped historic west end of Alligator Point is severely eroded for 0.4 mile. The eastern end of Alligator Peninsula between the Southwest Cape and Lighthouse Point is designated critically eroded for 1.1 miles, where past storms have destroyed and continue to threaten private development and a county road. The southeastern end of St. James Island is critically eroded, extending north from Lighthouse Point for 0.4 mile, threatening residential development. Riverine Erosion

	The documented riverine erosion on the Apalachicola River (in Liberty County was up to 20 feet off the riverbank on a homeowners property). While it is unknown how many feet of riverfront are lost per year in Franklin County, risk is primarily concentrated along the Apalachicola, Ochlockonee and the Carrabelle rivers. Erosion can result in catastrophic damage to structures if they are located on an eroding shoreline. An extreme example of riverine erosion would be a logjam of trees and other debris against a bridge washing the land away and causing the bridge to collapse.
Impact	Coastal Erosion Franklin County experienced significant impact from Hurricane Michael. The major structural damage included: 160 single family dwellings were damaged, 3 multi-family dwellings were damaged, and 2 other major structures – total damaged was 165 structures. See table 4.37 for further identification. Riverine Erosion The Franklin County communities living near the Apalachicola River could be impacted if a bridge collapsed and residents were unable to use the bridge for transportation.

Wildfires

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

Photo source: USA Today, Fire in Eastpoint, FL

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

Florida's ecosystems are dependent on natural fire. These low intensity fires re-nourish soil, thin abundant vegetation, and provide proper conditions for reproduction and forage. However, since the early 1950's when Floridians actively began to suppress all fires to protect newly planted forest areas and keep newly built dwellings safe, vegetative fuel has become dense and thick. Natural fires have given way to dangerous wildfires, which often damage rather than benefit natural surroundings.

The growing number of people relocating to Florida adds to the wildfire problem as nearly 1,000 people move to Florida each day. Additionally, Floridians who are tired of big-city life are moving to rural areas to "get back to nature". Many

of them choose to live in areas where natural vegetation meets homes and communities. These areas are called the Wildland-Urban Interface, and many of these new residents are unaware of the natural role of fire in Florida and therefore are unprepared.

Wildland-Urban Interface fires are fast moving fires that often require many pieces of fire-fighting equipment, and suppression is a difficult and time-consuming operation. Wildfire suppression must also take on the challenge of home protection during almost every fire that is detected. The cost of these operations grows proportionally with their complexity.

Historical Data Occurrences of Fires by Causes, Florida Forest Service (1/1/2000 – 7/27/2000)

Table 4.39 reports statistics from the Florida Forest Service, Fires by Causes, over the last 20 years reveals that 448 fires occurred burning over 20,454.8 acres In Franklin County.

Table 4.39 – Fires by Causes
Franklin County (1/1/2000 – 7/27/2020)

Cause	Fires	Percent	Acres	Percent
Campfire	18	4.02	140.1	0.68
Children	25	5.58	35.2	0.17
Debris Burn *	28	6.25	6198.4	30.30
Debris Burn – Authorized Broadcast/Acreage	24	5.36	3433.8	16.79
Debris Burn – Authorized – Piles	4	0.89	0.6	0.00
Debris Burn – Authorized – Yard Trash	2	0.45	0.2	0.00
Debris Burn – Non-Authorized Broadcast/Acreage	6	1.34	5.2	0.03
Debris Burn – Non-Authorized – Piles	11	2.46	79	0.04
Debris Burn – Non-Authorized – Yard Trash	17	3.79	88.0	0.43
Equipment Use *	9	2.01	171.6	0.84
Equipment – Agriculture	2	0.45	0.3	0.00
Equipment – Logging	6	1.34	9.5	0.05
Equipment – Recreation	3	0.67	18.2	0.09
Equipment – Transportation	3	0.67	24.6	0.12
Incendiary	64	14.29	2937.3	14.36
Lightning	90	20.09	3111.5	15.21
Misc. – Breakout	2	0.45	95.0	0.46
Misc. – Electric Fence	0	0	0.00	0.00
Misc. – Fireworks	4	0.89	7.0	0.03
Misc. - Power Lines	26	5.80	56.9	0.28
Misc. – Structure	3	0.67	0.4	0.00
Misc. – Other	19	4.24	655.3	3.20
Railroad	0	0	0.0	0.00
Smoking	7	1.56	21.5	0.11
Unknown	75	16.74	3436.3	16.80
Total	**448**		**20,454.8**	

Source Florida Forest Service: https://fireinfo.fdacs.gov/fmis.publicReports/FiresByCause.aspx

* Fire cause no longer used

Historical Wildfire Occurrences from NCDC

According to the NCDC, 1/1/1950 – 7/20/2020 there was 3 wildfire occurrence reported in Franklin County with location, date, time, the type of event, if there were any deaths or injuries, and the property and crop damage estimates.

Table 4.40 – Franklin County Wildfire (1/1/1950 –7/20/2020)

Location or County	Date	Time	Type	Death	Injuries	Property Damage	Crop Damage
Apalachicola Airport	6/20/1998	11:30	Wildfire	0	0	0.00K	0.00K
Carrabelle	7/1/1998	14:00	Wildfire	0	0	0.00K	0.00K
Coastal Franklin Zone	6/24/2018	17:30	Wildfire	0	0	800K	0.00K
Total						**Property Damage: $800,000**	

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

Hazard Event Narrative – Extent and Impact

1. 6/20/1998, Apalachicola Airport – A 60+ acre wildfire erupted at the intersection of Gibson and Airport road near the Apalachicola Airport. The fire was contained with a few hot spots remaining and no homes were threatened. There was no property damage recorded.

2. 7/1/1998, Carrabelle – A 100+ acre wildfire erupted 12 miles north of Carrabelle off SR 67. There was no property damage recorded.

3. 6/24/2018, Eastpoint – A wildfire developed in the Eastpoint area during the late afternoon of June 24th. It quickly spread from the woods to nearby homes as strong northernly outflow from a thunderstorm to the north moved through the area with wind gusts of 25-30 mph. The fire destroyed 36 homes with an additional 4 homes sustaining minor damage. There were 184 people who requested assistance through the Red Cross. The fire grew to more than 950 acres and the loss of property damage was estimated to be at least $800,000. In addition, it was noted that this wildfire was a result of a prescribed burn conducted.

Photo Image: Tallahassee Democrat

Additional Wildfire Occurrences (Disaster Declarations)

Table 4.41 - Disaster Declarations for Franklin County Due to Fires

IA, PA or both	Date – Incident Period	Disaster Event and Incident Type	Declaration #
IA, PA	May 25, - July 22, 1998	Fires	1223
PA	April 15 – May 25, 1999	Fires	3139

Note: Throughout the State of Florida, 1998 was significant year for wildfires due to severe drought conditions. The first wildfire to break out was on May 25, 1998 in the Apalachicola National Forest in Liberty County, a neighboring county for Franklin. Although specific details on wildfires for Franklin County seemed relatively low, the county did experience wildfire events and requested IA and PA assistance.

Consequences of a Wildfire

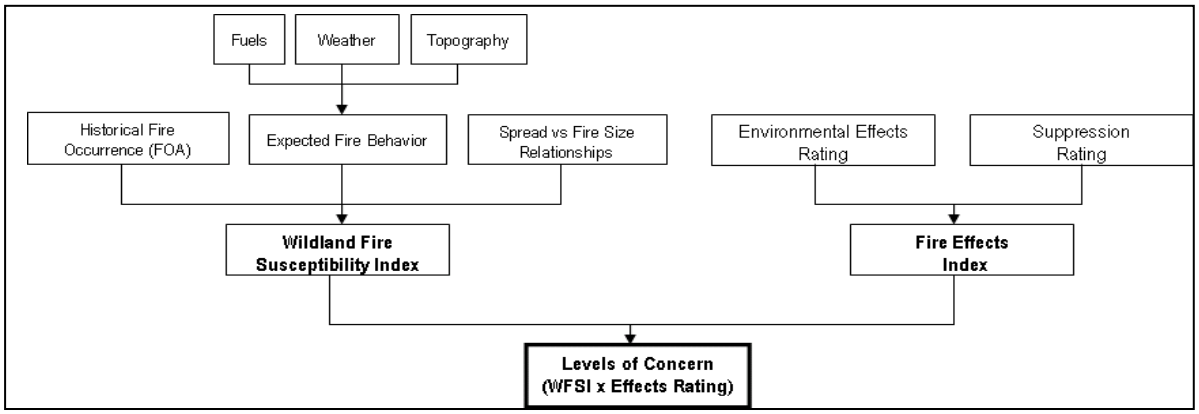
There are many types of causes that can start a wildfire, from lightning, to incendiary, to smoking in forested areas or improperly extinguishing campfires, etc. Prevention efforts include working not only educating people on forested areas, but also working with the Florida Forest Service and having the community citizens become a firewise community for preventative measures in protection from a wildfire. Consequences for a wildfire can be the following, see Table 4.42.

Table 4.42 - Consequences of Wildfire

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

The Florida Forest Service levels of concern (LOC) measures wildland fire risk (Figure 4.23). The level of concern is calculated from the probability or likelihood of an acre burning (Wildland Fire Susceptibility Index), and the expected effects of the fire (Fire Effects Index). The Fire Response Accessibility (FRA) Index is a measure of the initial attack response time to a cell from existing initial dispatch locations for fire protection resources. Taken as a pair, these two indices (LOC and FRA) define a cell's accessibility and its vulnerability to wildland fire occurrence and effects. As a result, non-burnable areas and 9 LOC categories ranging from low concern to high concern were assigned. The LOC results can be used to identify areas where mitigation options may be of value.

Figure 4.23 - Wildfire Level of Concern Variables



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

Prevention

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

- ✓ The Fire Prevention Awareness Program – Smokey Bear remains an active part of our overall prevention message with visits to the schools in Franklin County to promote wildfire safety and the benefits of fire prevention.

- ✓ The Firewise Communities Program educates homeowners and community professionals about creating defensible space around their homes, helping to protect them from the dangers of wildfire. The program is based upon two principles:
  - Homeowners must take responsibility for home fire safety and become “partners” with the fire protection agencies, and
  - Homes (neighborhood an communities) can be designed, built and maintained to withstand a wildland fire without the intervention of a fire department.

- ✓ Franklin County addresses issues relating to firewise communities in the Community Wildfire Protection Plan (CWPP).
- ✓ Materials are distributed on fire prevention to the Franklin County residents.

Risk and Vulnerability Assessment

The wildfires that burned in Florida over the last 25 years are examples of the increasing wildfire threat which results from the Wildland Urban Interface (WUI). The Wildland Urban interface is defined as the area where structures and other human development meet with undeveloped wildland or vegetative fuels (FEMA). As residential areas expand into relatively untouched wildlands, people living in these communities are increasingly threatened by forest fires.

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

Details from the Franklin County CWPP state that only 20% of Franklin County would be considered WUI. However, there are areas that have serious fuel loading issues. They are as follows:

- ✓ Bald Point State Park (included small community)
- ✓ St. Teresa Beach
- ✓ East Lanark and St. James Bay Community
- ✓ Kendrick Road
- ✓ Hickory Hammock
- ✓ Carrabelle Beach and Lighthouse Point Estates
- ✓ North Bay Shore Drive in Eastpoint
- ✓ Bay City Road and Old Breakaway Lodge Road

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

In calculating the WUI Risk Rating, the WUI housing density data is combined with flame length data and response functions to define the potential impacts to homes and people and likely to take place. Fire intensity data is modeled to incorporate penetration into urban fringe areas so that outputs better reflect real world conditions for fire spread and impact in fringe urban interface areas. With this enhancement, houses in urban areas adjacent to wildland fuels are incorporated into the WUI risk modeling.

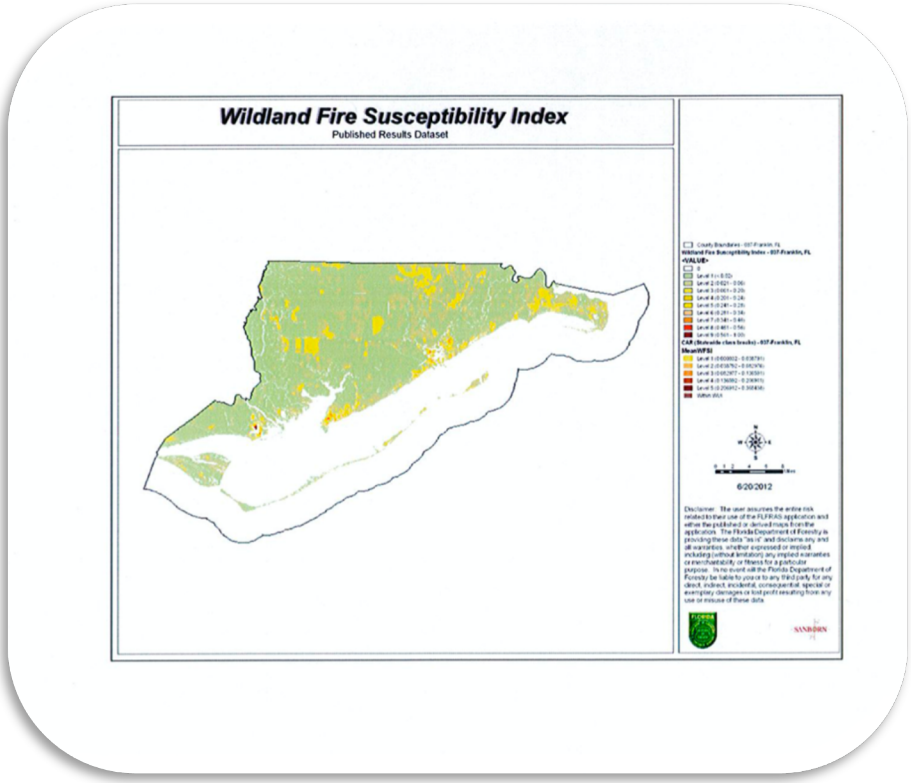
Table 4.43 - Communities at Risk in Franklin County

High Risk	Bald Point Eastpoint St. Teresa
Medium Risk	Bay City Carrabelle Beach Carrabelle Lighthouse Chason Place

	Franklin Green Point Lanark Village Two Mile Yent Place
Low Risk	Apalachicola Bloody Bluff Brickyard Landing Carrabelle Creels Eleven Mile Hays Place McIntyre Nine Mile Pine Log Rock Landing Tilton Tuckers Place Wright Landing

Source: CWPP, Franklin County

Figure 4.24 – Franklin County Wildland Fire Susceptibility Index



Source: CWPP, Franklin County

Vulnerability for the Franklin County's Population

Franklin County had a 6.3% growth rate from 2010 to 2019 with population total in 2019 of 12,273. The % projected assessment for the population growth from 2019 to 2020 is -0.5%, or an estimated population total of 12,213. The 2020 – 2025 population projection is expected to increase 2.7% to 12,541 in 2025. The population at risk and vulnerable to wildfires is noted in Table 4.44.

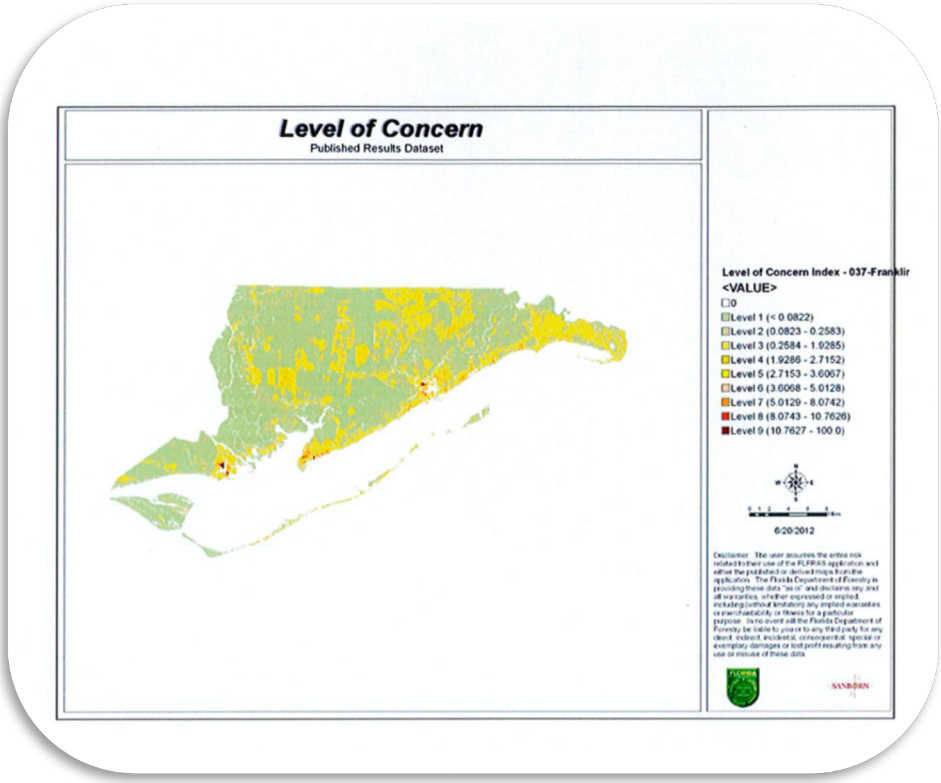
Table 4.44 - Wildfire Population by Level of Concern Category

County	LOC 1	LOC 2	LOC 3	LOC 4	LOC 5	LOC 6	LOC 7	LOC 8	LOC 9
Franklin	338	333	2742	465	321	308	381	143	25

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

Specifics from Table 4.xx, the highest vulnerability for the population would be the level of concern: 3 with 2,742 residents at risk within the population. The topmost risk areas for the population are in the unincorporated areas of the county due to the concentration of residents in rural wooded areas, additional threats to life and property exist, therefore, requiring increased mitigation efforts. This segment of the population could include the mobile home residents which accounts for 16.4% of the residential structures, the poor, the sick, the elderly, the children, and a segment of the single-family home population living in the unincorporated area of the county.

Figure 4.25 – Franklin County Level of Concern



Source: CWPP, Franklin County

Vulnerability for Franklin County's Structures and Facilities

Franklin County's buildings, infrastructure and critical facilities are considered vulnerable to damage caused by wildfires. According to the CWPP, there is 1 structure at medium risk in the City of Apalachicola, 5 structures are low risk in the City of Carrabelle, and 50 at low risk, 87 at medium risk, and 197 at high risk in the unincorporated areas of Franklin County.

Summary details for wildfire events:

Probability of Future Occurrences	The probability for wildfire events is high (at least 1 occurrence every year) particularly during drought cycles and very dry conditions. Florida's dry season usually begins in November and continues through May or June, with the driest months being March through May or June. The drought monitor should be watched for the county especially during the Springtime on a daily basis.
Geographic Area	The entire County (the City of Apalachicola, the City of Carrabelle, and unincorporated areas of Franklin County) is highly susceptible to wildland fires based on the heavily forested composition of the county. There are different levels of risk for Franklin County as noted in Table 4xxx and discussion on the county's structures and facilities vulnerability details from the CWPP.

Extent	Data recorded from FEMA states that disaster declarations occurred two times (5/25 – 7/22/1998 and 4/15 – 5/25/1999) in Franklin County requiring PA or both IA and PA. Additional Extent Data According to the CWPP, in FY 2000 there were 27 fires in Franklin County with specifics from the Florida Forest Service that 4,167.1 acres burned in the County that year. On 6/24/2018 in Eastpoint a wildfire developed in the Eastpoint area during the late afternoon of June 24th. The fire grew to more than 950 acres and the loss of property damage was estimated to be at least $800,000. In addition, based on the data recorded from the Florida Forest Service, wildfires can be severe for the homes, buildings, structures and agriculture. The data reveals that over the last 20 years 448 fires were recorded with total acreage burned was 20,454.8 acres. Continued education and guidance for the county citizens is necessary for the overall safety for the residents.
Impact	The Franklin County community, the residents, structures, and critical facilities could be impacted from a wildfire event. Although the county is located on the gulf coast, there is considerable forestry land area in the county and this could present some impact to road closures due to smoke and visibility resulting in evacuations for some of the unincorporated county residents. On 6/24/2018 a wildfire developed in the Eastpoint area during the late afternoon of June 24th. It quickly spread from the woods to nearby homes as strong northernly outflow from a thunderstorm to the north moved through the area with wind gusts of 25-30 mph. The fire destroyed 36 homes with an additional 4 homes sustaining minor damage. There were 184 people who requested assistance through the Red Cross. The fire grew to more than 950 acres and the loss of property damage was estimated to be at least $800,000. In addition, it was noted that this wildfire was a result of a prescribed burn conducted.

Community Wildfire Protection Plan (CWPP)

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

In 2013 Franklin County established their CWPP. Located in Appendix G, the plan provides the planning process, vulnerability assessment, the current wildfire protection activities, the CWPP goals and objectives, the action plan, and the implementation and maintenance for the plan. Updating the CWPP is on the current LMS Project List.

The CWPP can consolidate knowledge and serve as a single resource for wildland fire risk and hazard mitigation information. As populations' increase and development continues to push into the rural wildland areas, it will be necessary to take active steps to reduce the wildfire risk to Franklin County residents. Through the approved CWPP, development regulations, vegetative fuel reduction, and on-going public education programs in high-risk areas, the potential for loss of human life and property from wildfire can be greatly reduced.

Drought and Heat Wave (Extreme Heat)

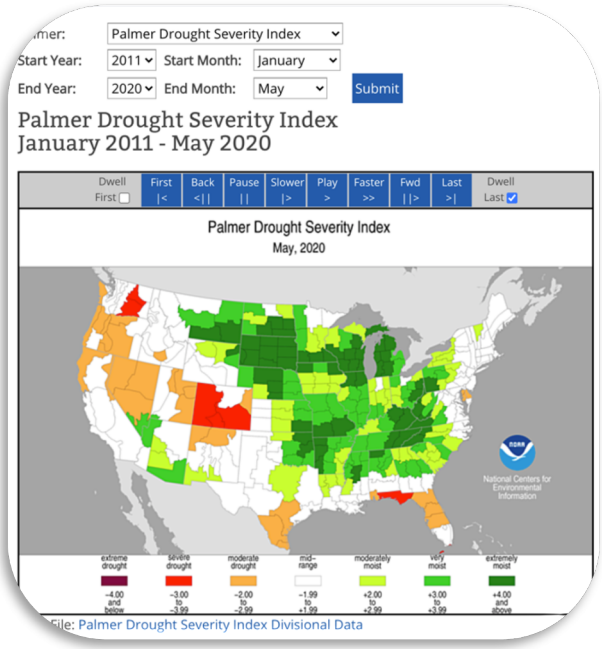
Drought

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

Figure 4.26 – Palmer Drought Severity Index

The drought data noted in Table 4.45 was derived from the Palmer Drought Severity Index from NOAA, Climate Monitoring. The Palmer Drought Severity Index (PDSI) is an indicator of the relative dryness or wetness effecting water sensitive economies. The PDSI indicates the prolonged and abnormal moisture deficiency or excess. This indicator is of general conditions and not local variations caused by isolated rain. Calculation of the PDSI is made for 350 climatic divisions in the United States and Puerto Rico. The data collected for the calculations include the weekly precipitation total and average temperature, division constants (water capacity of the soil, etc.) and previous history of the indices.

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



Source: https://www.ncdc.noaa.gov/temp-and-precip/drought/historical-palmers/psi/201101-202005

Historical Drought Occurrences

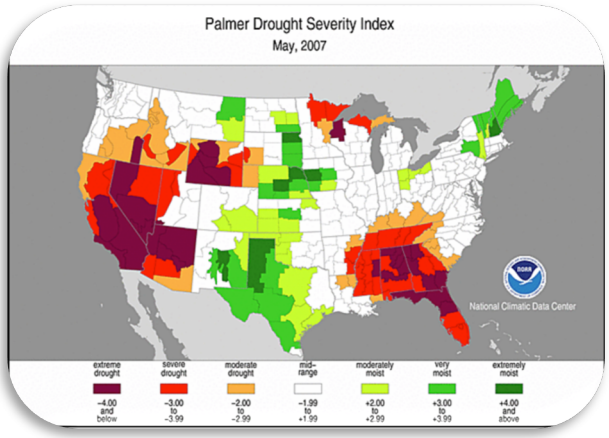
According to the Florida Climate Center, *Historic Drought in Florida…* " Because drought is defined on so many different levels, has differing impacts, and can happen on short or long time scales, it is hard to compare one drought to another. An examination of weather records since 1900 reveals that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

Extreme Drought Occurrences (2006 – 2008)

Since 2000, the longest duration of drought (D1 – D4) in Florida lasted 124 weeks beginning on April 11, 2006 and ending on August 19, 2008.

Figure 4.27 – Palmer Drought Severity Index, May 2007

In 2007, it was ranked the lowest annual Palmer Drought Severity Index (PDSI) value since established records in 1895.



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

Palmer Drought Severity Index (PDSI) Drought Occurrences

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

Table 4.45 - Palmer Drought Severity Index January 2011 – June 2020 for Franklin County

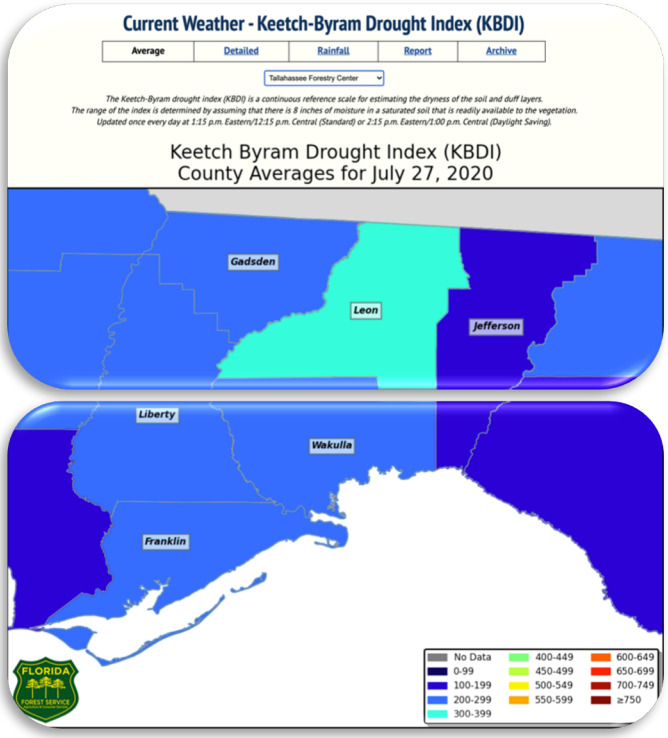
Years	Data on Drought
2011	There was a recorded period of time in the months of January, February, and March with periods of moderate drought. In April and May there was severe drought for the area. And in June, July, August, September, October, November and December there was extreme drought.
2012	There was a recorded period of time in the months of January, February, March, April and May each experienced extreme drought.
2013	There was no drought data recorded in 2013.
2014	There was moderate drought in September and October in 2014.
2015	There was a recorded period of time in the months in July, August, September and October in 2015 with moderate drought.
2016	There was moderate drought in November 2016.
2017	There was moderate drought in April 2017.
2018	There was no drought data recorded in 2018.

2019	There was a recorded period of time in the months of May, July, August and December with moderate drought. There was severe drought in the months of September, October and November.
January – June 2020	There was a recorded period of time in the months of January, February, and June that experienced moderate drought. There was severe drought in March, April and May of this year.

Source: https://www.ncdc.noaa.gov/temp-and-precip/drought/historical-palmers/psi/201101-202006

Keetch Byram Drought Index (KBDI)

Figure 4.28 – KDBI, Florida Forest Service



In addition to the drought monitor and PDSI, the county utilizes KBDI, which is updated each day by the Florida Forest Service Weather Service, see Figure 4.26. KBDI is a good indicator of the drought/moisture conditions for agricultural purposes, and it also provides a planning tool for the risks of wildfire. This index provides a numerical scale of 100 through 750, with 750 being the driest and 100 being wettest.

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

Historical Drought Occurrences from NCDC

According to the NCDC, 1/1/1950 – 7/20/2020 there was 22 drought occurrences reported in Franklin County with location, date, time, the type of event, if there were any deaths or injuries, and the property and crop damage estimates.

Table 4.46 – Franklin County Drought (1/1/1950 –7/20/2020)

Location or County	Date	Time	Type	Death	Injuries	Property Damage	Crop Damage
Coastal Franklin Zone	5/24/2011	0:00	Drought	0	0	0.00K	0.00K
Inland Franklin Zone	5/24/2011	0:00	Drought	0	0	0.00K	0.00K
Inland Franklin Zone	6/1/2011	0:00	Drought	0	0	0.00K	0.00K
Coastal Franklin Zone	6/1/2011	0:00	Drought	0	0	0.00K	0.00K
Coastal Franklin Zone	7/1/2011	0:00	Drought	0	0	0.00K	0.00K
Inland Franklin Zone	7/1/2011	0:00	Drought	0	0	0.00K	0.00K
Coastal Franklin Zone	8/1/2011	0:00	Drought	0	0	0.00K	0.00K
Inland Franklin Zone	8/1/2011	0:00	Drought	0	0	0.00K	0.00K
Coastal Franklin Zone	9/1/2011	0:00	Drought	0	0	0.00K	0.00K
Inland Franklin Zone	9/1/2011	0:00	Drought	0	0	0.00K	0.00K
Coastal Franklin Zone	10/4/2011	0:00	Drought	0	0	0.00K	0.00K
Inland Franklin Zone	10/4/2011	0:00	Drought	0	0	0.00K	0.00K
Coastal Franklin Zone	4/1/2012	0:00	Drought	0	0	0.00K	0.00K
Inland Franklin Zone	4/1/2012	0:00	Drought	0	0	0.00K	0.00K
Coastal Franklin Zone	5/1//2012	0:00	Drought	0	0	0.00K	0.00K
Inland Franklin Zone	5/1/2012	0:00	Drought	0	0	0.00K	0.00K
Coastal Franklin Zone	6/1/2012	0:00	Drought	0	0	0.00K	0.00K
Inland Franklin Zone	6/1/2012	0:00	Drought	0	0	0.00K	0.00K
Coastal Franklin Zone	1/9/2018	0:00	Drought	0	0	0.00K	0.00K
Inland Franklin Zone	1/9/2018	0:00	Drought	0	0	0.00K	0.00K
Coastal Franklin Zone	2/1/2018	0:00	Drought	0	0	0.00K	0.00K
Inland Franklin Zone	2/1/2018	0:00	Drought	0	0	0.00K	0.00K

Total	**Property Damage: N/A**

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

Details on the Oyster Fisheries in Franklin County

In the previous LMS plan, a report from the University of Florida, UF report: Collapse of Oyster Industry Due to Drought, Salinity, April 26, 2013 was inserted revealing that drought, insufficient rainfall and salinity in the Apalachicola Bay helped cause a dramatic fall in the oyster population.

July 2020
The Oyster Fishery is one of the most vulnerable assets for Franklin County. On July 22, 2020, the Florida Fish and Wildlife Conservation Commission voted to shut down the Apalachicola oyster fishery for up to 5 years after years of drought and other pressures that have devastated the wild oyster beds, effective date: August 1, 2020.

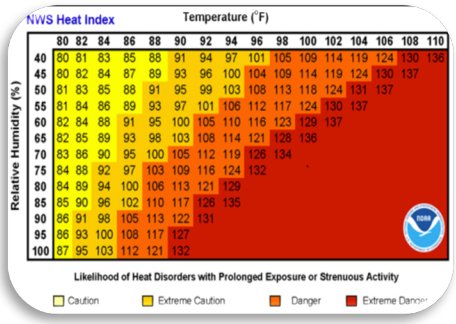
The pressure has been mounting for oyster harvesters in Franklin County due to droughts, the BP oil disaster, Hurricane Michael, and lack of fresh water from the rivers upstream. The Florida fisheries regulators say a moratorium on oyster harvesting for up to five years will give wild oyster reefs time to regenerate.

At the height in 2012, the dockside value of the fishery was just over $9 million. Since the 2012 federal fisheries disaster declaration, several state and federal projects have sought to restore the bay but with little lasting success. Th annual oyster harvest has dropped from more than 3 million pounds to less than 21,000 pounds. The dockside dollar value of that catch declined 98% over that time period which has presented a significant impact to the County.

Grant
An $8 million grant from the Triumph board was given to Florida State University Marine Lab to develop a full-scale plan of action for restoring the Apalachicola Bay ecosystem and its oyster reefs.

Heat Wave/Extreme Heat

Figure 4.29 - Heat Index Chart



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

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

To find the HI, look at the Heat Index Chart, Figure 4.29. As an example, if the air temperature is 98°F (found on the top of the table) and the RH is 50% (found at the left of the table), the HI or how hot it really feels - is 113°F.

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

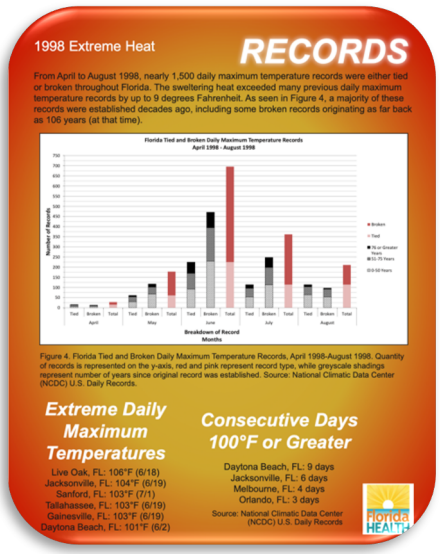
shaded zone above 105°F. This corresponds to a level of HI that may cause increasingly severe heat disorders with continued exposure and/or physical activity.

Franklin County's hot season are the months of June to September with an average temperature range 88.9°F in June, 90°F in July, 90°F in August and 87°F in the month of July. Heat wave events occurring in the hot season would be in the 100°F plus temperature range. From researched resources (i.e. NWS), *the hottest temperature recorded in Carrabelle was 104°F on September 26, 1899, and 98°F for the City of Apalachicola in 2015*. Although the relative humidity data was not available, the county is located in a humid subtropical climate zone and at the time, the humidity was probably high. To determine what the Heat Index might have been for this record temperature of 104°F, if the RH was only 45%, the HI would have been 124°F based on the Heat Index Chart.

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

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

Although no data is recorded on any historical heat related death occurrences in the County, it was stated in the extreme-heat-factsheet from Florida Heath 1998, there were at least 8 heat-related deaths from April to August in the State of Florida. Due to the fact that the City of Carrabelle had a record high heat of 104°F, there probably were some heat-related incidents reported on June 18 - 19, 1998 timeframe.



Heat Related Occurrence

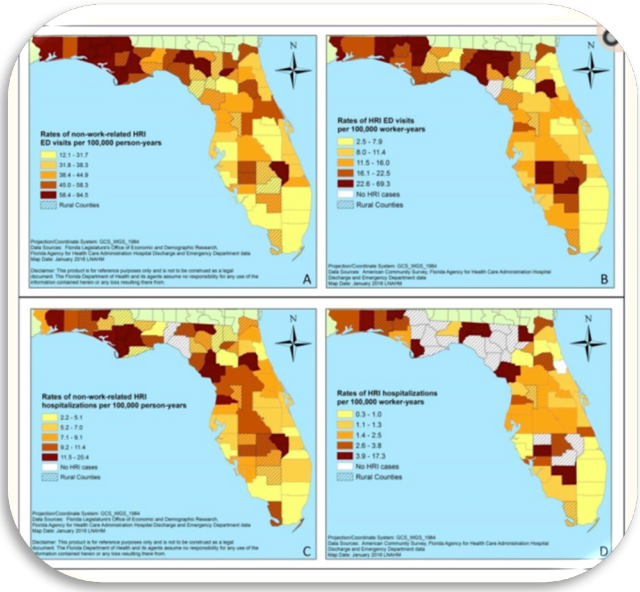
As reported by the International Journal of Environmental Research and Public Health, A Comprehensive Evaluation of the Burden of Heat-Related Illness and Death within the Florida Population, June 2016, among Florida residents, during the Florida warm season (May–October) for 2005–2012, there were 23,981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

Figure 4.30 demonstrates that Franklin County details are as follows:

- Box A -Rates of non-work related HRI ED visits per 100,000 person-years (45 - 58.3 for Franklin); the 2nd highest category
- Box B - Rates of HRI ED visits per 100,000 worker-years (16.1 – 22.5 for Franklin); the 2nd highest category
- Box C – Rates of non-work related HRI hospitalization per 100,000 person-years (2.2 – 5.1 for Franklin); lowest category
- Box D – Rates of HRI hospitalizations per 100,000 worker-years (No HRI cases for Franklin)

Figure 4.30 – Statistics on Heat-Related Incident Rates for the Florida Counties

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



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

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

According to the Florida Department of Health in Franklin County, data as to exact number of residents to ED related incidents for HRI is not recorded for the county.

Historical Heat Related Occurrences from NCDC

According to the NCDC, 1/1/1950 – 7/20/2020 there was 3 heat and excessive heat occurrences reported in Franklin County.

Table 4.47 – Franklin County Heat and Excessive Heat (1/1/1950 –7/20/2020)

Location or County	Date	Time	Type	Death	Injuries	Property Damage	Crop Damage
Coastal Franklin Zone	7/29/201	15:00	Heat	0	0	0.00K	0.00K
Coastal Franklin Zone	7/30/2010	11:00	Heat	0	0	0.00K	0.00K
Coastal Franklin Zone	7/31/2010	12:00	Excessive Heat	0	0	800K	0.00K
Total							**Property Damage: N/A**

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

Hazard Event Narrative – Extent and Impact

1. 7/31/2010, Coastal Franklin Zone – Above normal temperatures and high humidity combined to produce heat index values above 110°F across part of the Florida panhandle at the end of the month. Heat index values exceeded 115°F in a few locations on occasion. Dewpoint values in the 80s combined with temperatures in the 90s produced a long stretch of heat index values frequently above 110°F. The heat index exceeded 115 °F with a peak value of 124°F. The temperature was 95°F with a dewpoint of 84.2 °F.

Additional Heat Related Occurrence

1. 8/22 – 23/2014, Franklin County – Record temperatures occurred in the incorporated and unincorporated areas of the county. The record for Apalachicola was 97°F with a 70% humidity level. According to the NWS, the heat index was about 130°F.

Risk and Vulnerability Assessment

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

During the onset of a drought, which can occur every year in a given area can result in elevated fire risk and as discussed a critical risk that has occurred to the vital and very important asset for Franklin County, the Oyster Fisheries have been significantly impacted from drought and a few other causes.

Vulnerability for the Franklin County's Population

Franklin County had a 6.3% growth rate from 2010 to 2019 with population total in 2019 of 12,273. The % projected assessment for the population growth from 2019 to 2020 is -0.5%, or an estimated population total of 12,213. The 2020 – 2025 population projection is expected to increase 2.7% to 12,541 in 2025. The entire estimated population could be affected by a drought or a heat wave event, especially water shortages, which could present a serious problem.

Heat Wave Event

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

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

Table 4.48 – Estimated % of the Franklin Population that could be Affected by a Heat Wave Event

Estimated % of the Franklin County Population ACS Demographic and Housing Estimates, 2018 that could be affected by a Heat Wave Occurrence	
% of 65 years of age over	21.4% or approximately 2,515 elderly residents (based on data from Table 3.3)
% of children 5 years or younger	4.3%, or approximately 516 children (based on data from Table 3.3)
% in poverty, all ages	22.8% or approximately 2,676 residents (based on data from Table 3.5)

Vulnerability for Franklin County's Structures and Facilities

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

Summary details for drought/heat wave events:

Probability of Future Occurrences	The probability for drought or heat wave events is high (at least 1 occurrence every year).
Geographic Area	The entire planning area (the City of Apalachicola, the City of Carrabelle, and unincorporated areas of Franklin County) is likely to be uniformly exposed to a drought or heat wave event (in the populated unincorporated areas). Drought has presented a very high risk for the Oyster Fisheries in the Apalachicola Bay.
Extent	**Drought** Based on the quantitative measurement for droughts, the extent and worse-case scenario for a drought event would be the drought occurrences from 1998 – 2002 and 2006 - 2008. the longest duration of drought (D1 – D4) in Florida lasted 124 weeks beginning on April 11, 2006 and ending on August 19, 2008. 1998-2002 As stated by the USGS… " Lower than normal precipitation caused a severe statewide drought in Florida from 1998 to 2002. Based on precipitation and stream flow records dating to the early 1900s, the drought was one of the worst ever to affect the State. In terms of severity, this drought was comparable to the drought of 1949-1957 in duration and had record-setting low flows in several basins. The drought was particularly severe over the 5-year period in the northwest, where rainfall deficits ranged from 38-40 inches below normal. Within these regions, the drought caused record-low stream flows in several river basins, increased freshwater withdrawals, and created hazardous conditions ripe for wildfires, sinkhole development, and even the draining of lakes." 2006 - 2008

	In May 2007, the PDSI value was ranked the lowest annual since established records in 1895. In May 2007 showed some of the driest extreme drought conditions over the three-year period which had an effect on Franklin County. Note: The drought occurrences over the 10+ years have slowly intensified the disastrous situation for the Oyster Fisheries in Apalachicola Bay with the closure over the next few years beginning August 1, 2020. **Heat Wave/Extreme Heat** The hottest temperature recorded in Carrabelle was 104 °F on September 26, 1899. Although the relative humidity data was not available, the county is located in a humid subtropical climate zone and at the time, the humidity was probably high. To determine what the Heat Index might have been for this record temperature of 104°F, if the RH was only 45%, the HI would have been 124°F based on the Heat Index Chart. Additional extent data for Heat Wave/Extreme Heat 7/31/2010, Coastal Franklin Zone – Above normal temperatures and high humidity combined to produce heat index values above 110°F across part of the Florida panhandle at the end of the month. Heat index values exceeded 115°F in a few locations on occasion. Dewpoint values in the 80s combined with temperatures in the 90s produced a long stretch of heat index values frequently above 110°F. The heat index exceeded 115 °F with a peak value of 124°F. The temperature was 95°F with a dewpoint of 84.2 °F. 8/22 – 23/2014, Franklin County – Record temperatures occurred in the incorporated and unincorporated areas of the county. The record for Apalachicola was 97°F with a 70% humidity level. According to the NWS, As stated in Figure 4.30 – in Franklin County from 2005 – 2012, the County experienced the 2nd highest category for non-work related and worker years for HRI ED visits: • Box A -Rates of non-work related HRI ED visits per 100,000 person-years (45 - 58.3 for Franklin); the 2nd highest category • Box B - Rates of HRI ED visits per 100,000 worker-years (16.1 – 22.5 for Franklin); the 2nd highest category
Impact	**Drought** Drought is a prolonged period when there is a precipitation deficit from normal values. The duration of below normal precipitation amounts and their impacts can affect the County's water supplies, the fisheries, and the fire danger levels and is measured on the basis of the severity of these impacts. Droughts impact on the water levels and can last for months or even years and the data shows a continued trend of lower groundwater levels, which could present a significant impact for the entire community. Oyster Fisheries At the height in 2012, the dockside value of the fishery was just over $9 million. Since the 2012 federal fisheries disaster declaration, several state and federal projects have sought to restore the bay but with little lasting success. Th annual oyster harvest has dropped from more than 3 million pounds to less than 21,000 pounds. The dockside dollar value of that catch declined 98% over that time period which has presented a significant impact to the County. **Heat Wave/ Extreme Heat** The Franklin County community and residents would be impacted from a heat wave/extreme heat event with a combination of high temperatures with a high heat index especially during the summer months. Elderly persons, small children, special needs, and those on certain medications or drugs, are particularly susceptible to heat reactions, especially during heat waves in areas where a moderate climate usually prevails.

	Small children are incredibly susceptible to heat, especially in a vehicle as it only takes approximately 10 minutes to heat up 19 degrees, so that it can reach lethal temperatures quickly. A child is more susceptible than adults to heat as their bodies heat up 3 to 5 times quicker and can suffer a heat stroke. And as stated in Figure 4.30 – in Franklin County from 2005 – 2012, the County experienced the 2nd highest category for non-work related and worker years for HRI ED visits: • Box A -Rates of non-work related HRI ED visits per 100,000 person-years (45 - 58.3 for Franklin); the 2nd highest category • Box B - Rates of HRI ED visits per 100,000 worker-years (16.1 – 22.5 for Franklin); the 2nd highest category

.

Winter Storms/Freezing Temperatures

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

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

Freezing Temperature Record

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

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

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

Historical Winter Weather Occurrences

According to the NCDC in table 4.49, there was four winter weather/storm occurrences reported in Franklin County over the last 70 years, however, additional data on winter events are noted from other resources.

Table 4.49 – Winter Weather/Storm Occurrences in Franklin County – (1/1/1950 – 7/20/2020)

Location or County	Date	Time	Type	Death	Injuries	Property Damage	Crop Damage
Coastal Franklin Zone	1/28/2014	16:00	Winter Storm	0	0	100K	0.00K
Inland Franklin Zone	1/28/2014	16:00	Winter Storm	0	0	100K	0.00K
Coastal Franklin Zone	1/3/2018	03:00	Winter Weather	0	0	0.00K	0.00K
Inland Franklin Zone	1/3/2018	03:00	Winter Weather	0	0	0.00K	0.00K
Totals:	**Property Damage:$200,000**						

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

Hazard Event Narrative – Extent and Impact

1. 1/28/2014, Coastal and Inland Franklin Zone – The 3rd winter storm to impact the NWS Tallahassee County warning area in 5 years brought a wintry mis of precipitation to virtually the entire forecast area. The predominant precipitation types were sleet and freezing rain. Total liquid estimates were greater than ¼ inch across portions of most of the Florida Panhandle counties. Several roads were closed, including a large stretch of I-10 in the Florida Panhandle. Most bridges were closed at one point from Tallahassee westward, and during the peak of the event, there was no road access to cross over the Apalachicola River.

   Source: https://www.weather.gov/tae/event-20140128_winterstorm

   This led to very large transportation impacts with significant monetary losses for trucking companies. The bridge going to St. George Island was closed at one point due to ice. The property damage estimates were $200,000.

1. 1/3/2018, Coastal and Inland Franklin Zone – Early in the morning on 1/3/18, portions of north Florida had a mix of wintry precipitation. In the areas around Tallahassee, the precipitation was initially freezing rain and sleet, but changed to snow. Snow accumulations in north Florida were less than ½ inch. There was no property damage recorded.

Additional Winter Weather/Freezing Temperature Occurrences

(Recorded data from the following sources: NOAA News; NOAA Southern Region Headquarters; NWS; and NCDC, (there weren't specific details for Franklin County regarding the Storm of the Century).

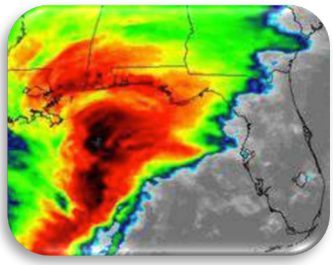
- ✓ 2/9/1999 — One hundred years ago this week an arctic blast froze two-thirds of the nation, setting records that stand today. A blizzard paralyzed the Eastern Seaboard and for only the second time in recorded history, the Mississippi River brought ice to the Gulf of Mexico. In Florida, the centennial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

- ✓ 3/13/1993 – The No Name Storm (data from NCDC) - The "Storm of the Century" roared across Florida producing a variety of severe and unusual weather conditions for a period of about 18 hours from late Friday, 3/12 to late Saturday, 3/13. A severe squall line raced eastward at 50 mph ahead of an intense low producing several tornadoes and strong downbursts as it moved through the state and directly causing fatalities. From intense storm surge and flooding on the gulf coast to a period of 8 to 12 hours of high sustained winds of up to 50 mph with gusts to 70 mph to cold air which poured in behind the intense low with up to four inches of snow falling in the panhandle to a trace to 3 inches elsewhere across north Florida. Record or near record low temperatures occurred over much of the state the following two nights. Total property damage for the State was estimated at $1.6 billion and 47 fatalities, Upstream, the artic, polar and subtropical jet streams were merging and a deep flow of tropical moisture over the Gulf was coming north from the Caribbean Sea. These merging factors set the timer for the impending explosion. The winds howled as the storm moved north with the strongest recorded wind gusts were 110 mph for Franklin County, (specific property damage for Franklin County statistics and fatality data was not available).

- ✓ The coldest temperature recorded in Apalachicola was 9°F on January 21, 1985.

Risk and Vulnerability Assessment

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



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

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

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

Vulnerability for the Franklin County's Population

Franklin County had a 6.3% growth rate from 2010 to 2019 with population total in 2019 of 12,273. The % projected assessment for the population growth from 2019 to 2020 is -0.5%, or an estimated population total of 12,213. The 2020 – 2025 population projection is expected to increase 2.7% to 12,541 in 2025.

The entire population would be at risk and vulnerable to winter storm and freezing temperature leaving several homes without heat or water resulting in shelter needs to assist and care. The most vulnerable residents would be the elderly, the poor, the sick, the special needs, the poor and the mobile home residents. Having backup power and a designated emergency shelter is important during a winter storm or freezing temperature event.

Table 4.50 – Estimated % of the Franklin Population that could be Affected by a Winter Storm/Freeze Event

Estimated % of the Franklin County Population ACS Demographic and Housing Estimates, 2018 that could be affected by a Winter Storm/Freeze Occurrence	
% of 65 years of age over	21.4% or approximately 2,515 elderly residents (based on data from Table 3.3)
% of children 5 years or younger	4.3%, or approximately 516 children (based on data from Table 3.3)
% in poverty, all ages	22.8% or approximately 2,676 residents (based on data from Table 3.5)

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

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

Summary details for winter storm/freezing events:

Probability of Future Occurrences	Based on past occurrences, the probability of winter storm and freeze occurrence in Franklin County, is low for winter storms to possibly medium for freezing temperatures (winter storms at least 1 occurrence every 10 years, and freezing temperatures at least 1 occurrence every 3 years).
Geographic Area	The entire planning area (the City of Apalachicola, the City of Carrabelle, and unincorporated areas of Franklin County) is at risk to winter storms and freezing temperatures. Especially the residents that live on the coastal line of the county with icy road that could lead to road and bridge closures.

Extent	Based on historical data for the State of Florida, the coldest temperature was -2°F in February 1899. The coldest temperature recorded in Apalachicola was 9°F on January 21, 1985. These recorded temperatures would be the extreme and worse-case scenario for the State and Franklin County. In addition, although rare for Franklin County, freezing temperatures in the 20s and 30s can potentially occur and last for several days. Also, the County also suffered the effects from the Storm of the Century in March 1993.
Impact	Freezing temperatures and winter storms can have a destructive impact on the county's infrastructure. On 1/28/2014, the 3rd winter storm to impact the NWS Tallahassee County warning area in 5 years brought a wintry mis of precipitation to virtually the entire forecast area. The predominant precipitation types were sleet and freezing rain. Total liquid estimates were greater than ¼ inch across portions of most of the Florida Panhandle counties. Several roads were closed, including a large stretch of I-10 in the Florida Panhandle. Most bridges were closed at one point from Tallahassee westward, and during the peak of the event, there was no road access to cross over the Apalachicola River. This led to very large transportation impacts with significant monetary losses for trucking companies. The bridge going to St. George Island was closed at one point due to ice. The property damage estimates were $200,000.

Future Land Use

Buildout and Safe-Growth Analyses

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

Table 4.51 – Building Inventory by Occupancy Type, 2020

Type of Structure	County (Unincorporated)	City of Apalachicola	City of Carrabelle
Single Family Residential	4,823	1,154	491
Multi-Family Residential	1		3
Mobile Homes	960	65	244
Agricultural	195		
Commercial and Industrial	285	132	103
Government	20	110	36
Institutional			
Miscellaneous	57	47	375
Subtotal	**6,567**	**1,401**	**1543**
Total			**9,511**

Source: Franklin County Property Appraiser, July 2020

Table 4.52 – Parcel Count and Total Just Value of the Real Property in Franklin County

Property Type	# of Parcels	Just Value - Real Property
Single Family Residential	8,051	$1,627,869,879
Multi-Family Residential	472	$26,198,318
Vacant Residential	7,202	$365,634,165
Agricultural	185	$59,623,741
Vacant Acreage	57	$5,552,914
Commercial and Industrial	507	$97,947,940
Vacant Commercial and Industrial	181	$11,961,294
Government	1,374	$549,430,295
Institutional	93	$29,276,135
Miscellaneous	25	$1,785,016
Total # of Parcels	**18,147**	
Total Just Value of Real Property		**$2,775,279,697**

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

Franklin County Comprehensive Plan

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

The Comprehensive Plan has the following sections: Land Use; Traffic Circulation; Housing; Infrastructure; Coastal/Conversation; Recreation and Open Space; Intergovernmental Coordination; and Capital Improvements. There are several areas throughout the COMP that references future land use and highlights are detailed below. These specifics are important aspects in planning a buildout and safe-growth analyses and each area will be evaluated as amended. In addition, the Future Land Use Map should be viewed along with other important maps for the County.

LAND USE

GOAL - ENSURE THAT THE CHARACTER AND LOCATION OF LAND USES IN FRANKLIN COUNTY MINIMIZE THE THREAT TO THE NATURAL ENVIRONMENT OR PUBLIC HEALTH, SAFETY, AND WELFARE, AND MAXIMIZE THE PROTECTION OF THE APALACHICOLA BAY, WHILE RESPECTING INDIVIDUAL PROPERTY RIGHTS.

OBJECTIVE 1
Future development activities shall be directed to appropriate areas as depicted on the Future Land Use Maps to assure that soil conditions, topography, drainage, and natural conditions are suitable for development and adequate public facilities are available, and the Apalachicola Bay is protected from harmful impacts.
Policy 1.1 The Future Land Use Maps will be reviewed to be sure that adequate infrastructure is in place before areas are permitted for development. Adequate infrastructure is defined as the infrastructure necessary to maintain the adopted levels of service in this plan. The County shall not issue development orders that will degrade the existing levels of service below that level adopted as the minimum in this Comprehensive Plan.
Policy 1.2 The Future Land Use Maps will be reviewed to insure that the proposed uses, in the various categories, do not conflict with the prevailing natural conditions including:

(a) SOIL CONDITIONS - When the US. Soil Conservation Service completes and publishes the maps of their soil survey for Franklin County the County will coordinate the land use maps with the soil survey maps to ensure that areas proposed for development have soils suitable to support the proposed development.
(b) TOPOGRAPHY - Areas of excessive topographical relief shall be classified for low density development.
(c) DRAINAGE - Natural drainage features will be protected and preserved to ensure the continuation of their natural function.
(d) WETLANDS - No development will be allowed within 50 feet of wetlands, except as allowed pursuant to Policies 1.6 and 1.7 of this element, Policies 1.1, 1.2, and 1.5 of the Coastal Conservation Element or as provided in paragraphs 1-6, below.
(e) FLOODPLAINS - Any structural development will have to comply with the
county's Flood Hazard Ordinance which regulates construction within flood prone areas.
Policy 1.9 No parcel shall be created after April 3, 2001, which consists entirely of wetlands or which would not accommodate the construction of a single-family residential structure and the buffering standard established in Policies 1.2(d) and 3.1 of this Element, unless such parcel is included within a DRI consistent with Policy 1.6 or is encumbered by a deed or plat restriction, which prohibits future development on the parcel.

OBJECTIVE 2
Future growth and development shall be managed through the preparation, adoption, implementation, and enforcement of land development regulations.

OBJECTIVE 4
The County shall improve coordination with affected and appropriate governments and agencies to maximize their input into the development process and mitigate potential adverse impacts of future development and redevelopment activities by requesting in writing that agencies participate in the scheduled County Planning and Zoning Commission meeting when development along the shoreline is reviewed. This objective shall be accomplished by fulfilling the following policies.

OBJECTIVE 6
The County shall continue to review existing land uses for the purpose of eliminating any which are incompatible or inconsistent with the Future Land Use Plan.
Policy 6.1 Expansion or replacement of land uses which are incompatible with the Future Land Use Plan shall be prohibited.

OBJECTIVE 10
Adequate and suitable land for public facilities will be provided to serve future development. This objective shall be accomplished by fulfilling the following policy.

OBJECTIVE 3
The County shall coordinate transportation system improvements with the intent of Chapter 380.0555, Florida Statutes (Apalachicola Bay Area Protection Act), the future land uses shown on the future land use map of this plan, and with the plans of the Apalachee Regional Planning Council and the Florida Department of Transportation's Five-Year Transportation Plan. 9J-5.007(3)(b)2, 3

HOUSING

GOAL - PROVIDE DECENT, SAFE, AND SANITARY HOUSING TO MEET THE NEEDS OF ALL THE PRESENT AND FUTURE RESIDENTS OF THE COUNTY

OBJECTIVE 1
Increase the supply of affordable, standard housing to meet the housing needs of all existing and anticipated populations of the county. 9J-5.010(3)(b)1

POLICY 1.1 Through its land use and zoning maps, the County shall make sure that there is adequate land available to develop the required residential units. Adequate land shall be defined as maintaining at least the current ratio of vacant platted lots to developed platted lots in the unincorporated county.

COASTAL/CONSERVATION

GOAL - BALANCING GROWTH AND COASTAL RESOURCES – THE NATURAL AND HISTORIC RESOURCES OF THE COASTAL AREA SHALL BE PRESERVED, PROTECTED OR ENHANCED AS THE DEVELOPMENT PROPOSED IN THE FUTURE LAND USE ELEMENT OCCURS. 9J5.012 3(a)

OBJECTIVE 1
The wetlands of Franklin County shall be conserved and protected such that no net loss (after mitigation) shall occur. 9J5. 012 (3) (b) 1, (2); (2) (B) (3)
POLICY 1.5 No habitable development shall occur within 50 feet of the waters or wetlands of the State unless it is for principal water dependent structures in the commercial fishing district and then only after a stormwater management plan has been submitted and approved by the State Department of Environmental Protection (if applicable) and the local planning board. Docks and elevated pervious walkways may be permitted to allow access to the water. Habitable development may be permitted within 50 feet of the waters or wetlands of the State pursuant to Policies 1.2, 1.6 and 1.7 of the Future Land Use Element

OBJECTIVE 13
DEVELOPMENT DENSITY AND INTENSITY: The County shall through its Land Development Regulations, limit development density and intensity within the Coastal High Hazard Area and direct it outside of the Coastal High Hazard Area, to mitigate the impact of natural hazards in this area. 9J5.012 (3)(b)(6)
Policy 13.1 It shall be the policy of Franklin County to require that all land development applications within the Coastal High Hazard Area be planned and obtain approval pursuant to a site plan review process, to ensure that development is compatible with site characteristics. Applications will be reviewed for compliance with all applicable flood control regulation requirements.
Policy 13.2 Franklin County shall limit the density of new residential development within the Coastal High Hazard Area to a maximum of one dwelling units per acre (i.e., the maximum density associated with the low intensity residential category described in the Land Use Element). Maximum density/intensity of new commercial development within any area of the Coastal High-Hazard Area shall be limited to the lowest density/intensity for those areas as provided for in the Future Land Use Element.

OBJECTIVE 14
Hurricane Evacuation - The County shall conduct its hurricane evacuation procedures to ensure that Countywide evacuation clearance times do not exceed 16 hours for Category 1 storms and 24 hours for Category 2, 3, 4, and 5 storms. 9J5.012(3)(b)(7)
Policy 14.4 All future improvements to roads along the evacuation routes shall include remedies for flooding problems.

OBJECTIVE 15
Post-Disaster Redevelopment. By 2009, the County shall adopt a post-disaster response and cleanup assistance, procedures for redevelopment permitting and hazard mitigation measures. 9J5.012 (3)(b)(8)
Policy 15.7 As modified pursuant to policy 15.2, the County shall incorporate into this plan recommendations listed in the hazard mitigation appendix of the Comprehensive Emergency Management Plan, as well as applicable hazard mitigation recommendations from future revisions to the Regional Hurricane Preparedness Plan.

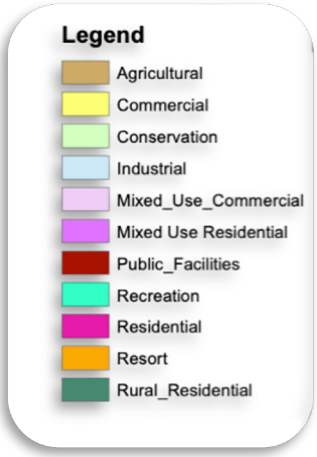
Future Land Use Map (FLUM)

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

The Franklin County Future Land Use Plan Map was updated in 2016 and the legend identifies the category areas: agriculture; commercial; conservation; industrial; mixed-use commercial; mixed-use residential; public facilities; recreation; residential; resort; and rural-residential.

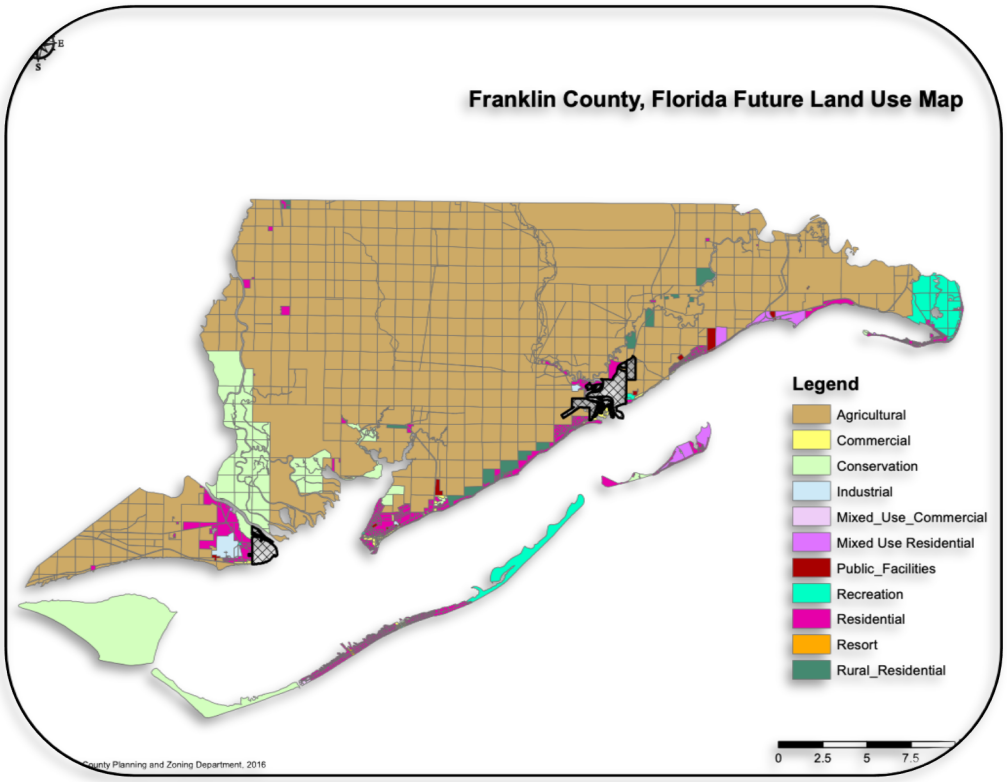
The map classification identifies that most of the county is agricultural. The jurisdictions specific are the City of Apalachicola and the City of Carrabelle with an overall population growth rate expected to increase at a fairly slow rate of 2.7% over the next five years (2020 – 2025).

Figure 4.31 - Classifications for the FLUM



As stated by the United States Department of Agriculture, Soil Conservation Service, Soil Survey of Franklin County, Florida, Woodland Management and Productivity… "Approximately 317,000 acres, or 91% of the county, is forestland. Of this total, the county has over 34,200 acres of federally owned land, of which about 21,800 acres is the Apalachicola National Forest. About 86% of the nonfederal land is owned by large companies that make woodland products. In this analysis, the projected land use for the county will remain predominately agricultural.

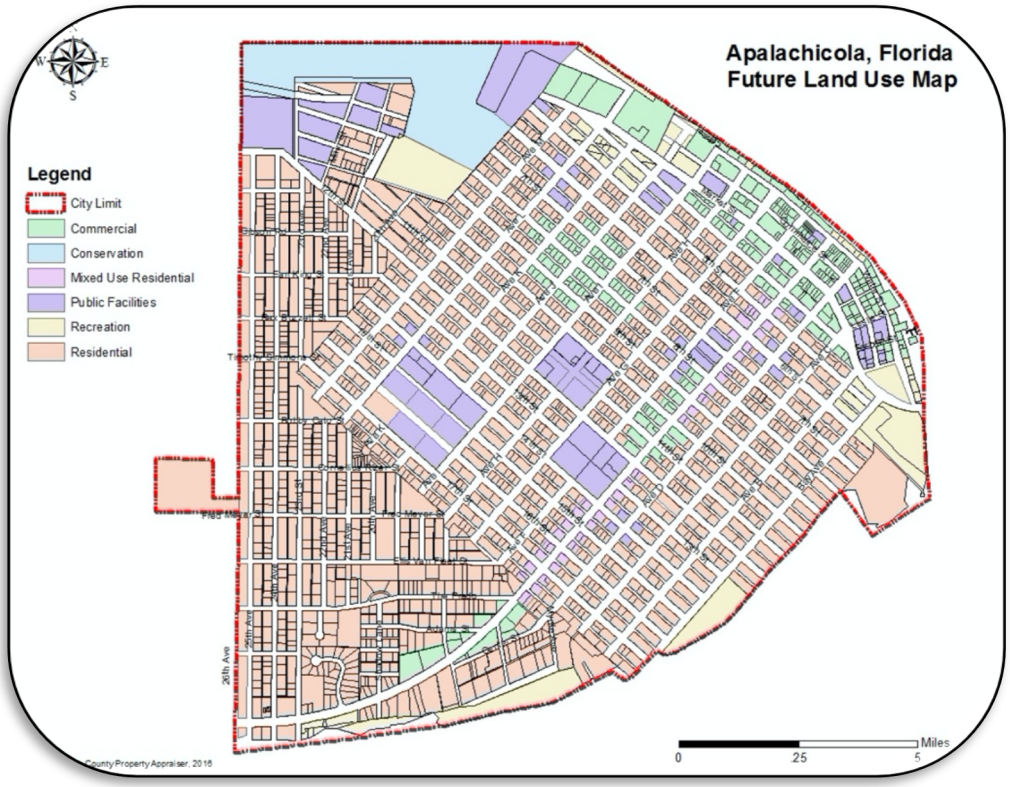
Figure 4.32 - Future Land Use Map for Franklin County



Source: Franklin County Planning and Zoning Department

The Classifications identified in the City of Apalachicola FLUM include the following: commercial; conservation; mixed use residential; public facilities; recreation; and residential.

Figure 4.33 – Future Land Use Map for the City of Apalachicola



Source: Franklin County Property Appraiser

As stated, Franklin County's projected growth rate for 2025 is only 2.7% increase in residents. Despite Franklin County's historically slow growth rate, the county still has much room for growth. It is clear that of the hazards with geographic boundaries, the county needs to predominantly consider ***flood, hurricanes, tropical storms, storm surge*** *and* ***coastal erosion*** in directing future development. Being a coastal county, these two hazards present the highest risk, as well as the highest potential for additional future losses in the future. The county should however keep all hazard areas in mind when permitting new development, so that development in these areas can be avoided or properly mitigated.

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