

Executive Summary

The experiences of the 2004 Hurricane Season epitomize the importance of better integrating hazard mitigation activities into local comprehensive planning. Residents from all over the state experienced significant damages from Hurricanes Charley, Frances, Jeanne, and Ivan by either winds, tornadoes, surge, or flooding. But this was not the only time that we have experienced natural disaster, nor will it be the last. In 1992, Hurricane Andrew devastated South Florida. In 1998 and 1999, most counties in Florida experienced wildfires. In some cases, despite fire fighters best efforts, the fires advanced through neighborhoods and homes were lost. Every year in Central Florida, new sinkholes emerge swallowing homes and damaging infrastructure. The cost of recovery for these various disasters ranges from hundreds of thousands to billions of dollars, significantly taxing local, state, and federal financial sources. Losses covered through federal funding as a result of the 2004 hurricanes alone could reach as high as \$7 billion. Worst of all, however, are the many lives that, directly or indirectly, are lost due to natural disasters. It is imperative that we reduce the human and financial costs of natural disasters. Through better integration of natural hazard considerations into local comprehensive planning, we can build safer communities.

This profile of Liberty County has been prepared as part of a statewide effort by the Florida Department of Community Affairs (DCA) to guide local governments on integrating hazard mitigation principles into local comprehensive plans. Through the process outlined in this profile, planners will be able to (1) convey Liberty County's existing and potential risk to identified hazards; (2) assess how well local hazard mitigation principles have been incorporated into the County's Comprehensive Plan; (3) provide recommendations on how hazard mitigation can better be integrated into the Comprehensive Plan; and (4) determine if any enhancements could be made to the LMS to better support comprehensive planning. Best available statewide level data is provided to convey exposure and risk as well as to illustrate the vulnerability assessment component of the integration process.

Summary of Recommendations

Liberty County's Comprehensive Plan has good integration of hazard mitigation principles and its LMS has adequate data and goals to support comprehensive planning. There are many goals, objectives, and policies that support risk reduction from floods in the LMS and Comprehensive Plan. However, there are always ways to strengthen such plans, and the following is a summary of options for the County to do so.

Comprehensive Plan Preliminary Recommendations

The following recommendations include hazard mitigation measures in which Liberty County can continue to reduce or eliminate risks from flood and wildfire. These recommendations pertain to the use of vacant lands and/or redevelopment practices. Based on the land use tabulations, most of the vacant acreage is susceptible to flood. For more information about the methodology and data used for the land use tabulations, please refer to Section 2. Hazard Vulnerability in this hazards profile.

Of the vacant lands, 676 are susceptible to 100-year flood and 165 acres are susceptible to wildfire. According to the Liberty County LMS, the County is deemed to have a low risk from sinkhole hazards.

Flood

About 38% of the 676 vacant acres in the 100-year floodplain are to be developed for residential or industrial uses, indicating that these risk reduction strategies should be considered prior to development of this vacant land.

- The Comprehensive Plan should continue restricting fill, structures, common water or sewage facilities, roads, agriculture, silviculture and residential structures in flood prone areas; and designating some floodplains for conservation.
- The Comprehensive Plan should continue to include a Future Land Use Map that includes the 100-year floodplain.
- The Comprehensive Plan should continue require all development to be elevated one foot above the base flood elevation, consider the loss of pervious surface during the site plan review for new development, and protect natural and historic resources from flooding.
- The Comprehensive Plan should continue the implementation of policies for preserving and enhancing the natural environment (i.e., 100-year floodplain) through the enforcement of land development regulations for floodplain management and stormwater management to maintain the natural functions.
- The Comprehensive Plan should continue to require that all developments have compensatory storage to ensure other areas do not become floodprone, and to require that harvests are planned so as not to significantly modify the natural hydrology and hydroperiod of wetlands.
- The Comprehensive Plan should continue to require that developer provide funding for stormwater management expenses to meet the adopted level of service, and that post-development runoff does not exceed pre-development rates.
- The Comprehensive Plan should continue to prohibit the conversion of wetland systems to upland systems.
- The Comprehensive Plan should continue requiring that stormwater runoff from properties, parking areas or roads not impact adjacent properties; and that post-development runoff rates not exceed pre-development rates.
- The Comprehensive Plan should consider requiring new school sites or future expansions be located outside floodplains, floodprone areas, or floodways, and avoid wetlands when possible.
- The Comprehensive Plan should continue to prohibit the storage of hazardous waste or materials in the floodplain.
- The Comprehensive Plan should continue to require that new roads be constructed to prevent interruption of natural drainage flows.
- The Comprehensive Plan should consider prohibiting new septic tanks in flood hazard areas or wetlands.
- The Comprehensive Plan should consider requiring that new or expansions of existing critical facilities not occur in floodways and in areas where potential for flooding exists.
- The County should consider retrofitting stormwater management facilities.
- The County should consider including a policy for reducing future losses through transfers of development rights from areas within the 100-year floodplain to areas outside the 100-year floodplain.
- The County should consider including a policy to not approve variances to required flood elevations.
- The County should consider requiring areas that have not established base flood elevations to be studied prior to development.

- The County should consider calling for compensating storage calculations in flood hazard areas.

Wildfire

About 76% of the 165 vacant acres that are susceptible to wildfire are to be developed for residential use, indicating that these risk reduction strategies should be considered prior to development of this vacant land.

- The County should consider participating in the Firewise Medal Community program to reduce risks within the wildland urban interface.
- Where reasonable, consideration should be made to design structures and sites within the County to minimize potential for loss of life and property (e.g., outdoor sprinkler systems, fire-resistant building materials or treatments, and landscaping and site design practices); review proposals for subdivisions, lot splits, and other developments for fire protection needs during site plan review process; coordinate with fire protection service or agencies to determine guidelines for use and development in wildfire-prone areas.
- The County should consider a requirement for all new development to include and implement a wildfire mitigation plan specific to that development, subject to review and approval by the County Fire Rescue Department.
- The County should consider increasing public awareness of prescribed burning and require management plans for conservation easements that address reduction in wildfire fuels.

Sinkhole

Sinkhole risk was considered to be very low in the hazards analysis in the latest version of the Liberty County LMS.

Sinkhole hazards could be evaluated further in the next update of the hazards analysis of the LMS to determine the risk. However, based on available data, it appears that sinkhole risk is very low.

General

- The Comprehensive Plan should consider including a policy to incorporate recommendations from existing and future interagency hazard mitigation reports into the Comprehensive Plan, and should consider including these recommendations during the Evaluation and Appraisal Report process as determined feasible and appropriate by the Board of County Commissioners.
- Include each hazard layer on the existing and future land use maps to determine where risks are possible to target hazard mitigation strategies.
- The Comprehensive Plan should consider including a policy to incorporate applicable provisions of the Comprehensive Plan into the Comprehensive Emergency Management Plan and the Local Mitigation Strategy.
- Continue educating the public, especially those at high risk from hurricanes, floods, and wildfires, & make them aware of proactive steps they can take to mitigate damage.

Local Mitigation Strategy Preliminary Recommendations

The following data and information could be included in an update of the LMS. This information could help convey how and where disasters impact the population and the built environment to support comprehensive planning.

- Provide information about demographic, income, and special needs populations.
- Include data layers on hazard maps to illustrate population (i.e., density) or property (i.e., value) exposure.
- Include a future land use maps that include hazard data layers to illustrate which future land use categories are susceptible to each hazard.
- Include loss estimates by land use.
- Include a quantitative risk assessment for future development (i.e., loss estimates) or specific critical facilities.
- Use complementary, not contradictory, data in the plans such as the LMS, CEMP, and Comprehensive Plan.

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1. County Overview



Geography and Jurisdictions

Liberty County is located in the Florida Panhandle. It covers a total of 843.2 square miles, of which 835.9 square miles are land and 7.3 square miles are water. There is one incorporated municipality within Liberty County, as shown in **Table 1.1**. The City of Bristol serves as the county seat.

Population and Demographics

According to the April 1, 2004 population estimate by the University of Florida’s Bureau of Economic and Business Research (BEBR), population estimates for all jurisdictions within Liberty County and the percent change from the 2000 U.S. Census are presented in **Table 1.1**. While some residents live in incorporated jurisdictions, over 87% live in unincorporated areas of the county. Liberty County has experienced significant population growth in recent years, a trend that is expected to continue. Between 1990 and 2000, Liberty County had a growth rate of 26.1%, which is slightly higher than the statewide average of 23.5% for the same time period.

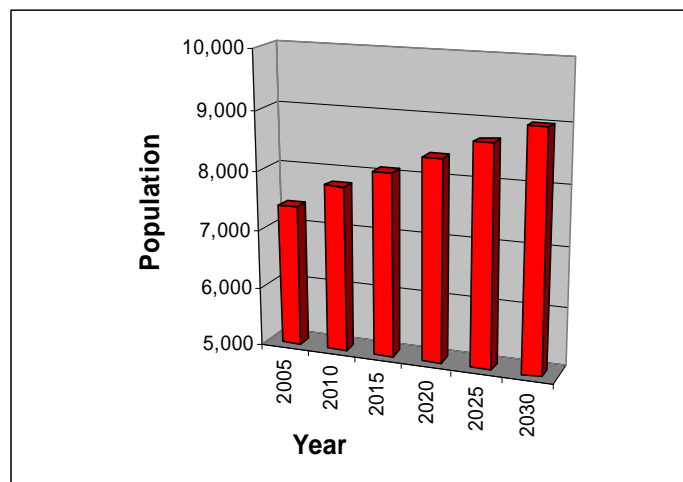
Table 1.1 Population Estimates by Jurisdiction

Jurisdiction	Population (Census 2000)	Population (Estimate 2004)	Percent Change 2000-2004	Percent of Total Population (2004)
Unincorporated	6,176	6,412	3.82%	87.19%
Bristol	845	942	11.48%	12.81%
Total	7,021	7,354	4.74%	100.00%

Source: University of Florida, Bureau of Economic and Business Research, 2004

According to BEBR (2004), Liberty County’s population is projected to grow steadily and reach an estimated 9,000 by the year 2030, increasing the average population density of nine to eleven persons per square mile. **Figure 1.1** illustrates medium growth population projections for Liberty County based on 2004 calculations.

Figure 1.1 Population Projections for Liberty County, 2005–2030



Source: University of Florida, Bureau of Economic and Business Research, 2004

Of particular concern within Liberty County’s population are those persons with special needs or perhaps limited resources such as the elderly, disabled, low-income or language isolated residents. According to the 2000 Census, of the 7,021 persons residing in Liberty County, 10.2% are listed as 65 years old or over, 28.4% are listed as having a disability, 19.9% are listed as below poverty, and 5.5% live in a home where the primary language is other than English.

2. Hazard Vulnerability

Hazards Identification

The highest risk hazards for Liberty County as identified in the County’s Local Mitigation Strategy (LMS) are tropical storms, hurricanes, floods, and wildfire. Although Liberty County is not a coastal county, storm surge that is pushed through the Apalachicola River from the Gulf of Mexico could pose a flood risk to areas along the eastern county boundary. Sinkhole risk was deemed to be medium to low.

Hazards Analysis

The following analysis examines two hazard types: flood and wildfire. All of the information in this section was obtained through the online Mapping for Emergency Management, Parallel Hazard Information System (MEMPHIS). MEMPHIS was designed to provide a variety of hazard related data in support of the Florida Local Mitigation Strategy DMA 2K project, and was created by Kinetic Analysis Corporation (KAC) under contract with the Florida Department of Community Affairs (DCA). Estimated exposure values were determined using FEMA’s designated 100-year flood zones (i.e., A, AE, V, VE, AO, 100 IC, IN, AH) for flood; all medium-to-high risk zones from MEMPHIS for wildfire (Level 5 through Level 9); and the combined high, very high, extreme and adjacent zones for sinkhole based on the KAC analysis. For more details on a particular hazard or an explanation of the MEMPHIS methodology, consult the MEMPHIS Web site (<http://lmsmaps.methaz.org/lmsmaps/index.html>).

Because the Liberty County LMS considers storm surge and sinkholes to be negligible hazards and MEMPHIS data indicates that no persons or structures are exposed to these hazards, no further analysis was conducted for these hazards.

Existing Population Exposure

Table 2.1 presents the population currently exposed to each hazard in Liberty County. Of the 7,021 (U.S. Census 2000) people that reside in Liberty County, 28.9% are exposed to 100-year flooding and 7.5% are exposed to wildfire. Of the 2,031 people exposed to flood, 57.9% are disabled and 19.1% are impoverished.

Table 2.1 Estimated Number of Persons Exposed to Selected Hazards

Segment of Population	Flood	Wildfire
Total (all persons)*	2,031	525
Minority	163	81
Over 65	209	54
Disabled	1,176	204
Poverty	388	105
Language-Isolated	0	0
Single Parent	133	21

Source: Mapping for Emergency Management, Parallel Hazard Information System

*Note: The “Total” amount does not equal the sum of all segments of the population, but indicates the total population at risk to the selected hazards.

Evacuation and Shelters

As discussed in the previous sections, population growth in Liberty County has been steady, and the trend is projected to continue. Additionally, storm events requiring evacuation typically impact large areas, often forcing multiple counties to issue evacuation orders simultaneously and placing a greater cumulative number of evacuees on the roadways which may slow evacuation time further. Thus, it is important to not only consider evacuation times for Liberty County, but also for other counties in the region as shown in **Table 2.2**. Also, population that will reside in new housing stock might not be required to evacuate as new construction will be built to higher codes and standards.

Table 2.2 County Clearance Times per Hurricane Category (Hours)
(High Tourist Occupancy, Medium Response)

County	Category 1 Hurricane	Category 2 Hurricane	Category 3 Hurricane	Category 4 Hurricane	Category 5 Hurricane
Calhoun	24	24	24	30	30
Gadsden	<i>Not Available</i>				
Holmes	6.25	7	7	10.25	10.25
Jackson	5.5	8.25	8.25	11	11
Liberty	<i>Not Available</i>				
Washington	6.25	6.5	6.5	8.5	8.5

Source: DCA, DEM Hurricane Evacuation Study Database, 2005

Note: This is best available data in 2005, although data is not available for some counties.

Data regarding evacuation clearance times for Liberty County is not yet available. The data in Table 2.2 was derived from eleven regional Hurricane Evacuation Studies that have been produced by FEMA, the United States Army Corps of Engineers and Regional Planning Councils in Florida. The study dates range from 1995 to 2004. These regional studies are updated on a rotating basis.

Similar to most of Florida’s coastal counties, Liberty County currently has a significant shelter deficit. According to Florida’s Statewide Emergency Shelter Plan, Liberty County has an existing shelter capacity of 600 people. The 2004 shelter demand for a Category 4 or Category 5 hurricane is 1,154 people, leaving an existing shelter deficit of 554. In 2009, the projected shelter demand is 1,273, leaving an anticipated shelter deficit of 673. This deficit is likely to be greater due to the influx of evacuees seeking shelter from nearby counties, as Liberty is a host county. Therefore, it is essential that Liberty County continue to coordinate with nearby counties for evacuation and shelter planning. The opportunity also exists to construct new facilities to standards that will allow them to serve as shelters, and to construct future public facilities outside of floodplain areas.

It is important for counties to maintain or reduce hurricane evacuation times. This could be accomplished by using better data to determine the hazard risk to populations to evaluate which areas to evacuate, and increasing the ability to shelter in place to decrease the number of evacuees. Liberty County could encourage new homes to be built with saferooms, community centers in mobile home parks or developments to be built to shelter standards (outside of the hurricane vulnerability zones), or require that new schools be built or existing schools be retrofitted to shelter standards; which would be based on FEMA saferoom and American Red Cross shelter standards. Additionally, the county could establish level of service (LOS) standards that are tied to development.

Existing Built Environment Exposure

While the concern for human life is always highest in preparing for a natural disaster, there are also substantial economic impacts to local communities, regions, and even the state when property damages are incurred. To be truly sustainable in the face of natural hazards, we must work to protect the residents and also to limit, as much as possible, property losses that slow down a community’s ability to bounce back from a disaster. **Table 2.3** presents estimates of the number of structures in Liberty County by occupancy type that are exposed to each of the hazards being analyzed. Exposure refers to the number of people or structures that are susceptible to loss of life, property damage and economic impact due to a particular hazard. The estimated exposure of Liberty County’s existing structures to the flood and wildfire hazards was determined through MEMPHIS.

Table 2.3 Estimated Number of Structures Exposed to Selected Hazards

Occupancy Type	Flood	Wildfire
Single Family	781	671
Mobile Home	210	143
Multi-Family	134	84
Commercial	141	105
Agriculture	1,217	870
Gov. / Institutional	307	180
Total	2,790	2,053

Source: Mapping for Emergency Management, Parallel Hazard Information System

There are 4,843 structures exposed to at least one of the two hazards, of which most are used for agriculture. Of these structures, 57.6% are exposed to flood. Nearly 2,800 structures are located within the 100-year floodplain. According to the latest National Flood Insurance Program Repetitive Loss Properties list, as of March 2005, there are no repetitive loss properties in unincorporated areas of Liberty County. Under the National Flood Insurance Program (NFIP), repetitive loss properties are defined as “any NFIP-insured property that, since 1978 and regardless of any change(s) of ownership during that period, has experienced: a) four or more paid flood losses; or b) two paid flood losses within a 10-year period that equal or exceed the current value of the insured property; or c) three or more paid losses that equal or exceed the current value of the insured property.”

Slightly over 42%, or 2,053 structures are exposed to wildfire, of which 42.4% are used for agriculture. Liberty County is a rural area where fires represent a major hazard, particularly for persons living outside of municipal boundaries. Wildfires, and structural fires with the potential to turn into wildfires, are of significant concern. (Liberty County LMS, 2005).

In addition to understanding exposure, risk assessment results must also be considered for prioritizing and implementing hazard mitigation measures. The risk assessment takes into account the probability (how often) and severity (e.g., flood depth, storm surge velocity, wildfire duration) of the hazard as it impacts people and property. Risk can be described qualitatively, using terms like high, medium or low; or quantitatively by estimating the losses to be expected from a specific hazard event expressed in dollars of future expected losses. Although people and property are exposed to hazards, losses can be greatly reduced through building practices, land use, and structural hazard mitigation measures. The next section of this report examines the existing and future land use acreage in hazard areas. This information can be useful to consider where to implement risk reducing comprehensive planning measures.

Analysis of Current and Future Vulnerability Based on Land Use

The previous hazards analysis section discussed population and existing structures exposed to flood and wildfire according to MEMPHIS estimates. This section is used to demonstrate the County's vulnerabilities to these hazards in both tabular format and spatially, in relation to existing and future land uses. DCA tabulated the total amount of acres and percentage of land in identified hazard exposure areas, sorted by existing land use category for the unincorporated areas. Existing land use data was acquired from County Property Appraisers and the Florida Department of Revenue in 2004. DCA also tabulated the total amount of acres and percentage of land in the identified hazards areas sorted by their future land use category according to the local Future Land Use Map (FLUM), as well as the amount of these lands listed as vacant according to existing land use. Liberty County future land use data was acquired in March 2001 and might not reflect changes per recent future land use amendments. DCA has provided maps of existing land use within hazard areas based on the 2004 County Property Appraiser geographic information system (GIS) shapefiles. Maps of future land uses in hazard areas were developed using the Liberty County future land use map dated March 2001. A series of maps were created as part of the analysis and are available as attachments to the county profile. All maps are for general planning purposes only.

For the purposes of this profile, the identified hazard areas include the coastal hazards zone in relation to storm surge, flood zones in relation to the 100-year flood, and wildfire susceptible areas.

In **Attachment A**, two maps present the existing and future land uses within the Coastal Hazards Zone (CHZ), which represents the Category 1 Hurricane Evacuation Zone joined with the Category 1 Storm Surge Zone. The areas that are most susceptible to storm surge are predominately public conservation lands located almost entirely within the Apalachicola National Forest, at the extreme southern end of the county. The total amount of land in the CHZ is 2,721 acres. As shown in **Table 2.4**, 88.1% are parks, conservation areas and golf courses; 10.4% are used for government, institutional, hospitals or education purposes; 0.7% is used for agriculture; and 0.7% is used for residential single-family homes. **Table 2.5** shows that there is no vacant acreage located in the CHZ

In **Attachment B**, two maps present the existing and future land uses within a 100-year flood zone. There are flood-prone areas scattered across the County. However, a majority of the large swaths surround the many creeks, streams and rivers like the Apalachicola River that forms the western county boundary and the Ochlockonee River that forms the eastern boundary, both which run south into the Gulf of Mexico. The total amount of land in the special flood hazard area is 314,574.1 acres. As shown in **Table 2.4**, 78.9% are parks, conservation areas and golf courses; 18.9% are in agricultural use; 1.2% is used for government, institutional, hospitals or education purposes; and 0.6% is used for transportation, communication, and rights-of-way. **Table 2.5** shows that of the 675.9 undeveloped acres, 60.9% are designated for agricultural use. The County has taken favorable action in designating a large portion of vacant acreage in the 100-year flood zone for agriculture.

In **Attachment C**, two maps present the existing and future land uses within wildfire susceptible areas. These isolated areas are scattered across the northern and eastern portions of the County. The total amount of land in the wildfire susceptible areas is 9,477.9 acres. As shown in **Table 2.4**, 71.9% are in agricultural use; 23.7% are parks, conservation areas and golf courses; 1.7% is currently undeveloped; and 0.8% is used for transportation, communication, and rights-of-way. **Table 2.5** shows that of the 165.4 undeveloped acres, 70.7% are designated for rural village development. The County should continue to take measures to reduce wildfire risk within the urban/rural interface.

Table 2.4 Total Unincorporated Acres in Hazard Areas by Existing Land Use Category

Existing Land Use Category		Coastal Hazard Zone	Flood Zones	Wildfire Susceptible Areas
Agriculture	Acres	19.8	59,450.1	6,815.6
	%	0.7	18.9	71.9
Places of Worship	Acres	0.0	0.0	3.6
	%	0.0	0.0	0.0
Commercial	Acres	0.0	4.0	0.0
	%	0.0	0.0	0.0
Government, Institutional, Hospitals, Education	Acres	282.7	3,770.9	47.3
	%	10.4	1.2	0.5
Industrial	Acres	0.0	0.0	2.0
	%	0.0	0.0	0.0
Parks, Conservation Areas, Golf Courses	Acres	2,396.9	248,311.2	2,250.7
	%	88.1	78.9	23.7
Residential Multi-Family	Acres	0.0	4.7	0.0
	%	0.0	0.0	0.0
Residential Mobile Home, or Commercial Parking Lot	Acres	0.0	167.2	35.9
	%	0.0	0.1	0.4
Residential Single-Family	Acres	19.6	263.3	77.1
	%	0.7	0.1	0.8
Transportation, Communication, Rights-Of-Way	Acres	2.0	1,926.8	79.6
	%	0.1	0.6	0.8
Utility Plants and Lines, Solid Waste Disposal	Acres	0.0	0.0	0.7
	%	0.0	0.0	0.0
Vacant	Acres	0.0	675.9	165.4
	%	0.0	0.2	1.7
Total Acres	Acres	2,721.0	314,574.1	9,477.9
	%	100.0	100.0	100.0

Source: Department of Community Affairs

Table 2.5 Total Unincorporated Acres in Hazard Areas by Future Land Use Category

Future Land Use Category		Coastal Hazard Zone		Flood Zones		Wildfire Susceptible Areas	
		Total	Vacant	Total	Vacant	Total	Vacant
Agriculture	Acres	272.2	0.0	61,154.4	411.3	6,488.2	39.0
	%	10.0	0.0	19.4	60.9	68.5	23.6
Industrial	Acres	0.0	0.0	29.0	26.3	1.3	0.0
	%	0.0	0.0	0.0	3.9	0.0	0.0
Mixed Use Rural Residential	Acres	0.0	0.0	278.4	11.4	56.2	0.7
	%	0.0	0.0	0.1	1.7	0.6	0.4
Mixed Use Suburban Residential	Acres	0.0	0.0	391.2	12.3	63.5	8.7
	%	0.0	0.0	0.1	1.8	0.7	5.3
Open Space/Conservation	Acres	2,308.2	0.0	249,436.2	8.5	2,099.6	0.0
	%	84.8	0.0	79.3	1.3	22.2	0.0
Prison	Acres	0.0	0.0	0.2	0.0	7.4	0.0
	%	0.0	0.0	0.0	0.0	0.1	0.0
Rural Village	Acres	140.7	0.0	3,284.7	206.2	761.8	117.0
	%	5.2	0.0	1.0	30.5	8.0	70.7
Total Acres	Acres	2,721.1	0.0	314,574.1	675.9	9,477.9	165.4
	%	100.0	0.0	100.0	100.0	100.0	100.0

Source: Department of Community Affairs

The amount of total land and existing vacant land in identified hazard areas was also tabulated for Liberty County's one incorporated municipality. These amounts are listed in **Table 2.6**. The intent of this table is to show the vacant acreage in hazard zones in the municipality, and to show the percentage of vacant acreage in each hazard zone for the municipality. In the total column for each hazard, the percentage for the municipality is the hazard zone acreage as a percent of total acreage for the municipality. In the vacant column for each hazard, the percentage for the municipality is the percent of area in the hazard zone for the respective municipality. The total municipal percent of vacant acreage is the percent of acreage in the hazard zones for all municipalities.

Bristol has less than one vacant acre in flood zones, which is 1.4% of all floodplain acreage in Bristol. Bristol also has 8.7 vacant acres in wildfire susceptible areas, which is 17.3% of all wildfire susceptible acreage in Bristol.

Vacant land is often destined to be developed. It is prudent to conduct further analyses of what the vacant lands will be used for, to determine whether they will be populated, and at what level of intensity/density, to ensure that hazard risks are minimized or eliminated. Each of the municipalities in Liberty County has vacant lands that are in hazard areas. Since hazards cross jurisdictional boundaries, it is important to consider all hazard areas to collaboratively formulate hazard mitigation strategies and policies throughout the county.

Table 2.6 Total Land and Existing Vacant Land in Hazard Areas by Municipal Jurisdiction

Jurisdiction		Flood Zones		Wildfire Susceptible Areas	
		Total	Vacant	Total	Vacant
Bristol	Acres	32.3	0.4	50.2	8.7
	%	100.0	1.4	100.0	17.3
Total Municipal Acres	Acres	32.3	0.4	50.2	8.7
	%	100.0	1.4	100.0	17.3

Source: Department of Community Affairs

3. Existing Mitigation Measures

Local Mitigation Strategy (LMS) Assessment

The Local Mitigation Strategy is suited to be a repository for all hazard mitigation analyses (i.e., vulnerability and risk assessment), programs, policies and projects for the county and municipalities. The LMS identifies hazard mitigation needs in a community and alternative structural and nonstructural initiatives that can be employed to reduce community vulnerability to natural hazards. The LMS is multi-jurisdictional and intergovernmental in nature. Communities can reduce their vulnerability to natural hazards by integrating the LMS analyses and mitigation priorities into the local government comprehensive plan.

As noted in DCA's *Protecting Florida's Communities* Guide, one significant strategy for reducing community vulnerability is to manage the development and redevelopment of land exposed to natural hazards. Where vacant land is exposed to hazard forces, local government decisions about allowable land uses, and the provision of public facilities and infrastructure to support those uses, can have major impacts on the extent to which the community makes itself vulnerable to natural hazards. Where communities are already established and land is predominately "built out," local governments can take initiatives to reduce existing levels of vulnerability by altering current land uses both in the aftermath of disasters, when opportunities for redevelopment may arise, and under "blue sky" conditions as part of planned redevelopment initiatives.

Per the *DCA's Protecting Florida's Communities* Guide, LMSes prepared pursuant to the state's guidelines (Florida Department of Community Affairs, 1998) have three substantive components:

Hazard Identification and Vulnerability Assessment. This section identifies a community's vulnerability to natural hazards. Under Florida rules, the HIVA is required to include, at a minimum, an evaluation of the vulnerability of structures, infrastructure, special risk populations, environmental resources, and the economy to any hazard to which the community is susceptible. According to FEMA, LMSes revised pursuant to the Disaster Mitigation Act of 2000 (DMA 2000) criteria must include maps and descriptions of the areas that would be affected by each hazard to which the jurisdiction is exposed, information on previous events, and estimates of future probabilities. Vulnerability should be assessed for the types and numbers of exposed buildings, infrastructure, and critical facilities with estimates of potential dollar losses. Plan updates will be required to assess the vulnerability of future growth and development.

Guiding Principles. This section lists and assesses the community's existing hazard mitigation policies and programs and their impacts on community vulnerability. This section typically contains a list of existing policies from the community's Comprehensive Plan and local ordinances that govern or are related to hazard mitigation. Coastal counties frequently include policies from their PDRPs.

Mitigation Initiatives. This component identifies and prioritizes structural and non-structural initiatives that can reduce hazards vulnerability. Proposals for amendments to Comprehensive Plans, land development regulations, and building codes are often included. Structural projects typically address public facilities and infrastructure, and buy-outs of private structures that are repetitively damaged by flood. Many of these qualify as capital improvement projects based on the magnitude of their costs and may also be included in the capital improvements elements of the counties' and cities' Comprehensive Plans.

The Liberty County LMS (adopted in 2005) was assessed to determine if the hazard analysis and vulnerability assessment (i.e., surge, flood, wildfire, and sinkhole) data can support comprehensive planning, whether the guiding principles include a comprehensive list of policies for the county and municipalities, and whether the LMS goals and objectives support comprehensive planning goals, objectives, and policies (GOP).

Hazard Analysis and Vulnerability Assessment (Page 6-39)

The strengths and weaknesses of the Hazard Analysis and Vulnerability Assessment are as follows:

Strengths:

- Provides a hazards analysis and a qualitative vulnerability assessment.
- Provides a clear description of geographic areas exposed to each of the hazards.
- Includes maps for each of the hazards.
- Includes a qualitative risk assessment for each hazard.

Weaknesses:

- Does not provide information about demographic, income, and special needs population.
- Hazard maps do not include data layers to illustrate population (i.e., density) or property (i.e., value) exposure.
- Does not include a future land use map, nor does it include future land use maps that include hazard data layers to illustrate which future land use categories are susceptible to each hazard.
- Does not include loss estimates by land use.
- Does not include a quantitative risk assessment for existing or future development (i.e., loss estimates) or specific critical facilities.

Incorporating land use and population data into the risk assessment of the LMS provides a better source of data for planners to use in policy making and policy evaluation of the local comprehensive plan. The LMS also sets a standard for the quality of data that should be used in determining risk and thereby used to determine mitigation policies.

Guiding Principles

The Liberty County LMS does not include a Guiding Principles section for the county nor the municipality. The Guiding Principles section is found in most counties' LMSes and is useful in providing the different jurisdictions ideas for enhancing their own plans or providing the LMS committee an analysis of where there may be weaknesses in implementing mitigation strategies. It is recommended that Liberty County's next LMS update include a Guiding Principles section.

LMS Goals and Objectives

The Jackson County LMS is currently being updated. The versions (July 2005 and 2006 draft) of the LMS that were reviewed referenced goals in Appendix A. These were not available for review at the time this report was prepared.

Maintaining consistent language for outlining goals and objectives in both the LMS and comprehensive plan presents a united front on decreasing risk in the county. While the LMS may not be able to regulate land use as the comprehensive plan does, having these common goals and objectives increases the likelihood of the jurisdictions of Liberty County adopting and implementing corresponding policies that are legally enforceable.

Comprehensive Emergency Operations Plan (CEMP)

The Liberty County CEMP references the LMS in the Mitigation Annex. The CEMP notes that Liberty County Emergency Management has a Mitigation Coordinator on staff that is responsible for the creation and continuous update of the LMS as well as the post-disaster function of mitigation. The CEMP briefly discusses hazard mitigation in the context of standard operating procedures, activities, responsibilities and available programs. This includes the post-disaster implementation of the Hazard Mitigation Grant Program and related disaster mitigation, response

and recovery assistance programs such as the FEMA Public Assistance Program which includes Hazard Mitigation funding, as well as pre-disaster mitigation programs such as the National Flood Insurance Program. The CEMP indicates that post-disaster development plans will fall within the guidance of existing and proactive code requirements.

The jurisdictions cooperate with each other to accomplish pre-disaster and post-disaster mitigation strategies and activities. All County and Municipal departments and agencies are responsible for the development of necessary plans to outline required functions following any natural disaster. Primary agencies coordinating mitigation activities are the Department of Emergency Management and the Building Department. The Mitigation Coordinator is responsible for the development of a Mitigation Assessment Team following a disaster. The Liberty County Growth Management Department will carefully review each hazard mitigation proposal and appropriate funding source(s).

As such, the CEMP is a good tool for planners, which includes collaborative procedures for working with emergency managers to reduce vulnerability from hazards.

Post-Disaster Redevelopment Plan (PDRP)

The Liberty County PDRP was not available for review at the time that this profile was developed.

National Flood Insurance Program/Community Rating System

Liberty County participates in the National Flood Insurance Program (NFIP). The municipality of Bristol does not currently participate in the NFIP. Neither Liberty County nor the municipality of Bristol currently participates in the NFIP Community Rating System (CRS).

4. Comprehensive Plan Review

Purpose and Intent

The Liberty County Comprehensive Plan (adopted July 25, 2000) was reviewed for the purpose of developing this profile. This review was undertaken in order to assess what steps Liberty County has taken to integrate hazard mitigation initiatives from their Local Mitigation Strategy (LMS) and hazard mitigation initiatives in general, into the local planning process. Each Element of the Plan was evaluated to establish the extent to which the principles from the LMS were incorporated into the objectives and policies of the existing Comprehensive Plan.

Approach

This review includes an assessment of flooding, wildfire, and sinkhole hazards. A preliminary list of objectives and policies currently contained in the Plan that pertain to hazard mitigation and any policies related to these hazards is found in **Attachment E**. The following is a discussion of the extent to which the Plan appears to address each of the hazards. Recent policy amendments may not have been available for review, or proposed policies might be in the process of creation, which address these hazards. As a result, this assessment is considered preliminary and subject to input from the local government.

Summary of Findings

The highest risk hazards for Liberty County as identified in the County's Local Mitigation Strategy (LMS) are tropical storms, hurricanes, floods, and wildfire. Liberty County is not a coastal county; though storm surge could cause riverine flooding. Sinkhole risk was deemed to be medium to low. Policies relating to hazard mitigation within the Plan include those relating to flooding and stormwater control and protection. There are no policies in the Plan focused on wildfire mitigation and protection measures.

The Liberty County Comprehensive Plan also focuses on the protection of natural features such as floodplains and wetlands, through development controls and stormwater management. The Plan supports a surface water management strategy that relies on natural features and natural systems to receive and otherwise manage storm and surface waters.

Flooding

Flooding is addressed from two vantage points, the protection of natural drainage features, and protection of properties through development standards and stormwater abatement. There are several policies directed at minimizing flooding and stormwater runoff, and protecting flood prone areas from potential development impacts. The Plan incorporates development controls in place to minimize the impact of new development within the 100-year floodplain which include: compensatory storage of floodwaters to ensure other areas do not become flood-prone (Policy 3.1 Conservation Element), permitting development within the 100-year floodplain if the finished floor elevation of first floor construction is at least one foot above the 100-year flood (Policy 3-2 CE), and requiring platted subdivisions to include buildable area outside of the floodplain on each lot (Policy 3-6 CE).

The mitigation of flood waters through stormwater quantity levels are addressed in the Capital Improvements and Infrastructure Elements. These elements stress the importance of providing adequate stormwater facilities, as well as maintaining stormwater discharge rates to an adopted level of service. Additionally, the Plan requires the Land Development Regulations to proactively protect natural drainage features and ensure future development provide adequate stormwater drainage facilities (Policy 3-1 CIE).

Sheltering

As with many inland counties in Florida, in the event of a hurricane, Liberty County may receive evacuees from coastal counties. The County is currently has a significant shelter deficit. According to Florida's Statewide Emergency Shelter Plan, Liberty County has an existing shelter capacity of 600 people. The 2004 shelter demand for a Category 4 or Category 5 hurricane is 1,154 people, leaving an existing shelter deficit of 554. The opportunity also exists to construct new facilities to standards that will allow them to serve as shelters, and to construct future public facilities outside of floodplain areas. This deficit is likely to be greater due to the influx of evacuees seeking shelter from nearby counties, as Liberty is a host county. Therefore, it is essential that Liberty County continue to coordinate with nearby counties for evacuation and shelter planning. The opportunity also exists to construct new facilities to standards that will allow them to serve as shelters, and to construct future public facilities outside of floodplain areas.

Wildfire

The Liberty County Comprehensive Plan does not address wildfire mitigation and management practices goals, objectives or policies.

Sinkholes

Although the LMS considers sinkholes a low risk to Liberty County, the Liberty County Comprehensive Plan requires sinkhole protection in Policy 3-4.3.c of the Capital Improvements Element. Any development which drains into a sinkhole must first allow the runoff to enter a grassed swale designed to percolate 80 percent of the runoff from a three year, one- hour design storm within 72 hours after a storm event.

5. Data Sources

County Overview:

Florida Statistical Abstract – 2004 (38th Edition). Bureau of Economic and Business Research, Warrington College of Business, University of Florida. Gainesville, Florida.

State and County QuickFacts. U.S. Census Bureau. Data derived from 2000 Census of Population and Housing.

Hazard Vulnerability:

Florida Repetitive Loss List March 05. Florida Department of Community Affairs, Division of Emergency Management, Flood Mitigation Assistance Office. March 2005.

Mapping for Emergency Management, Parallel Hazard Information System (MEMPHIS). Florida Department of Community Affairs, Division of Emergency Management.
<http://lmsmaps.methaz.org/lmsmaps/>

Protecting Florida's Communities – Land Use Planning Strategies and Best Development Practices for Minimizing Vulnerability to Flooding and Coastal Storms. Florida Department of Community Affairs, Division of Community Planning and Division of Emergency Management. September 2004.

State of Florida 2004 Statewide Emergency Shelter Plan. Florida Department of Community Affairs, Division of Emergency Management.

State of Florida. 2005 Hurricane Evacuation Study Database. Florida Department of Community Affairs, Division of Emergency Management.

GIS Data:

Flood Zone

Source: FEMA FIRM GIS coverages (1996), supplied by University of Florida GeoPlan Center Florida Geographic Data Library Version 3.0.

- Areas with an "A_", "V_", "FPQ", "D", "100IC", or "FWIC" value in the "Zone" field in these coverages were considered to be in the 100-year flood zone, and were used in the mapping/analysis.

Hurricane Evacuation Zone/Coastal High-Hazard Area (Category 1 Hurricane Evacuation Zone)

Source: GIS coverage of hurricane zones compiled by Florida Department of Community Affairs/Division of Emergency Management (2003), from GIS data collected from county emergency management agencies in the State of Florida.

- Areas shown/analyzed are those areas in the above-referenced GIS coverage where the value in the field "Evac_cat" is equal to "Zone TS", "Zone A/1", "Zone B/2", or "Zone C/3", in the maps/tables for the Hurricane Vulnerability Zone.
- Areas shown/analyzed are those areas in the above-referenced GIS coverage where the value in the field "Evac_cat" is equal to "Zone TS" or "Zone A/1", in the maps/tables for the Coastal Hazards Zone.

Hurricane Storm Surge Zone GIS Data

Source: GIS coverage of storm surge zones compiled by Florida Department of Community Affairs/Division of Emergency Management (2004), from various storm surge studies performed by regional planning councils and the U.S. Army Corps of Engineers.

- Areas shown/analyzed are those areas in the above-referenced GIS coverage where the value in the field "Category" is equal to "Tropical Storm" or "Category 1".

Sinkhole Hazard GIS Data

Source: Kinetic Analysis Corporation web site (2005),
at: http://lmsmaps.methaz.org/lmsmaps/final_cty/

- Areas shown/analyzed are those areas in the "Rawsink1.shp" GIS coverage supplied by KAC, where the value in the field "Gridcode" is 3 to 6, representing "High", or Very High, "Extremely High", or "Adjacent", based on the classification system used in the sinkhole hazard maps available at the above website.

Wildfire Susceptibility GIS Data

Source: Florida Department of Agriculture and Consumer Services/Division of Forestry, Florida Fire Risk Assessment System (FRAS) data, 2004.

- Areas shown as "wildfire susceptible areas" and that were analyzed are those areas with a "Wildfire Susceptibility Index" value of greater than 10,000 (in north Florida counties) or greater than 0.1 (in south Florida counties)*, based on the FRAS model, and that are also within areas of forest or shrub vegetation or "low impact urban" land cover, based on the Florida Fish and Wildlife Conservation Commission "Florida Vegetation and Land Cover - 2003" GIS data.
 - The rating scale in the "Wildfire Susceptibility Index" GIS coverages has a range of 0 to 100,000 in north Florida counties, and a range of 0 to 1.0 in south Florida counties.

Parks, Conservation Areas, Golf Courses

"Parks, Conservation Areas, Golf Courses" existing land uses include all public and private conservation areas depicted on the statewide GIS coverage of conservation lands "flma_200501.shp", produced by FDEP (2005).

Municipal Boundaries

Source: Boundaries of municipalities were extracted from the U.S. Census 2000 "Places" GIS coverage for the State of Florida.

ATTACHMENT A
Maps of the Existing and Future Land Uses within Coastal Hazards Zone

ATTACHMENT B
Maps of the Existing and Future Land Uses within the 100-year Floodplain

ATTACHMENT C
Maps of the Existing and Future Land Uses within Wildfire Susceptible Areas

ATTACHMENT D
Local Mitigation Strategy
Goals and Objectives Pertaining to Comprehensive Planning

Liberty County's LMS includes the following goals and objectives that are directly related to local comprehensive planning and growth management:

ATTACHMENT E
Liberty County Comprehensive Plan Excerpts Pertaining to Hazard Mitigation

From the July 25, 2000 Liberty County Comprehensive Plan

FUTURE LAND USE ELEMENT

Policy 1-1: (in part) Regulations in the County's Development Code shall include: subdivision of land, compatibility of adjacent land uses, open space, flood prone area protection, signage, traffic circulation, parking and site plan requirements.

Policy 1-4: (in part) Protect environmentally sensitive lands, including wetlands, floodplains that drain into waters of the state, endangered and threatened species habitat, existing at the time of the request for a development order and high recharge areas, through the designation of such lands as Conservation, Resource Protection, and Resource Management Areas, or through the implementation of comprehensive plan policies that are applicable to these areas. Development, as defined in Section 380.04, Florida Statutes, in these areas shall be limited to recreation, fish and wildlife management, and single family residential at a density of not more than 1 unit per 5 acres (unless more restrictive densities are established elsewhere in the plan).

Environmentally Sensitive Lands: Lands located within the unincorporated areas of Liberty County and within the city limits of Bristol, which are characterized by one or more of the following:

1. Specific denoted designated areas shown as conservation areas on the Future Land Use Map located within the one-hundred (100) year floodplain of a stream, river, lake, or depression, and possibly including the boundary or shoreline area associated with such floodplain. For the purposes of this definition, the one-hundred (100) year floodplain area shall be as shown on the Flood Insurance Rate Map (FIRM) as issued under the National Flood Insurance Program administered by the Federal Emergency Management Agency, and boundary or shoreline areas shall be those areas located within fifty (50) feet of the one-hundred (100) year floodplain.

2. Located within a wetland (connected or isolated) and including wetland fringe areas which are essential for maintaining the hydroperiod of the wetland. For the purposes of this definition, wetlands means lands that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands include swamps, marshes, bogs, sloughs, wet prairies, bay heads, cypress domes and strands, riverine swamps and marshes, hydric seepage slopes, and similar areas.

Policy 3-2: Liberty County shall ensure that natural and historic resources are protected through the provision of adequate drainage and stormwater treatment facilities, drainage and stormwater treatment plans will be submitted as part of the site plan and/or subdivision review process.

Policy 7-2: (in part) In order to maintain the overall ecological integrity of the wetlands community, select cuts, small clear cuts, or other irregularly shaped harvesting techniques will be allowed provided:

2. Harvests are planned to provide for varying age and height diversity supporting a variety of vegetative successional stages within the overall wetland ecosystem.
3. The natural hydrology and hydroperiod of wetlands are not significantly modified on a long-term basis and state water quality standards are not violated.

4. There is no conversion of wetland systems to upland systems. Nothing in this Policy is intended to conflict with Policy 7-1.

CONSERVATION ELEMENT

Policy 2-5: Removal of vegetation in wetlands shall be limited to the minimum which is necessary for development.

Policy 2-6: Access roads, driveways, and roads which are shown on the five year schedule of capital improvements shall be designed to minimize disturbance to natural water flows, hydroperiods, and other wetland functions, and shall be located in previously disturbed areas or the least environmentally sensitive area of the property.

Policy 2-7: Fill shall be limited to the minimum which is necessary for access and development. As an alternative structures shall be elevated on pilings.

Policy 2-8: Development on sites which include areas within wetlands shall be required to be located outside of the wetlands wherever possible.

Policy 2-9: New Subdivisions shall be required to include buildable area outside of the wetlands on each lot.

Policy 2-10: Fill will only be permitted within wetlands areas when it is placed and designed so as to minimize interference with natural water flows.

Objective 3: Future development within flood-prone areas may increase hazards to public safety and property, as well as impair the natural functions of floodplains. In order to reduce such hazards, the City and County shall implement mandatory site plan review criteria and requirements for development within flood-prone areas through the Land Development Regulations.

Policy 3-1: All proposed development in the 100 year floodplain will provide compensatory storage of floodwaters to ensure other areas do not become flood-prone.

Policy 3-2: Development meeting the criteria in Policy 3-1 shall be permitted if the finished floor elevation of first floor construction is at least one foot above the 100-year flood.

Policy 3-3: Other criteria for development in the 100 year floodplain shall include the use of anchoring to prevent flotation, use of piers and breakaway walls, and other criteria deemed necessary by the City and/or County to protect public health and safety. No development within Liberty County/Bristol shall be permitted which disrupts, significantly alters, or destroys the functioning of a major natural or preexisting man-made drainage feature or facility.

Policy 3-4: "Floodplain" shall be defined as the one-hundred (100) year floodplains shown on the Flood Insurance Rate Maps (FIRM) published by the Federal Emergency Management Agency, effective July 16, 1991.

Policy 3-5: Development on sites which include areas within the one-hundred (100) year floodplain shall be required to be located outside of the floodplain wherever possible.

Policy 3-6: Subdivisions shall be required to include buildable area outside of the floodplain on each lot.

Policy 3-7: Fill within floodplains shall be limited to the minimum which is necessary for development and access.

Policy 3-8: Fill shall be placed and designed so as to minimize interference with natural water flows.

Policy 5-2: Ensure post-development stormwater runoff rates for new development do not exceed pre-development runoff rates. Redevelopment activities will be treated as new development.

Policy 5-3: Site plan review of new development should consider loss of pervious surfaces which result in lowering of recharge capabilities and increasing runoff.

INTERGOVERNMENTAL COORDINATION ELEMENT

Policy 2.2: The County shall request assistance as needed from the Northwest Florida water Management District and the Department of Environmental Protection to coordinate the management of wetlands, natural drainage features, and prime recharge areas.

Policy 2.4: The County shall request assistance from the Florida Department of Environmental Protection to ensure that all development complies with stormwater treatment permitting requirements.

CAPITAL IMPROVEMENTS ELEMENT

Policy 3-1: All proposed capital improvement projects shall be evaluated based on their necessity to accomplish the goals identified by the comprehensive plan and their costs and affordability based on the annual budget for capital improvements and the Capital Improvements Element. Each of the following shall be considered when evaluating the necessity/feasibility of capital improvement projects:

1. The elimination of public hazards,

Policy 3-4: (in part) The following level of service (LOS) standards for public facilities shall be established. These standards are those found in the other elements of the comprehensive plan (Note: these LOS standards shall apply to new development located within Bristol and Unincorporated Liberty County):

3. Drainage - Water Quantity Standards: All drainage swales and ditches shall be designed to convey the runoff generated from a 10 year, 24-hour storm event. For local (not classified as County roads) roadways, culverts and cross drains shall convey the runoff from a 10-year, 24-hour storm event; for county roadways, culverts and cross drains shall convey the runoff from a 25-year, 24-hour storm event.
 - a. All development in the Residential, and Mixed Use categories of the Future Land Use Map shall meet the following standards:

All new residential subdivisions; all new residential development not part of a new subdivision which proposes greater than 20,000 square feet of impervious surface, and all new nonresidential development shall provide stormwater management facilities which ensure that the peak rate of runoff will not exceed the peak-rate of predevelopment runoff. For the purposes of this LOS requirement, redevelopment shall be considered as new development.

- b. All other land use categories of the Future Land Use Map shall be required to meet the following standards:
 - 2) All development meeting the minimum threshold for DER review under Chapter 17-25, F.A.C., shall provide stormwater management consistent with those DER rules. Proof of meeting the standard shall be a permit from DER.

- c. Any development exempt from DER rule 17-25, F.A.C., and which is adjacent to, or drains into a surface water, canal, or stream, or which enters a ditch which empties into a sinkhole, shall first allow the runoff to enter a grassed swale designed to percolate 80 percent of the runoff from a three year, one- hour design storm within 72 hours after a storm event.

INFRASTRUCTURE ELEMENT

Water Quantity Standards: All drainage swales and ditches shall be designed to convey the runoff generated from a 10- year, 24-hour storm event. For local (not classified as County roads) roadways, culverts and cross drains shall convey the runoff from a 10-year, 24 hour storm event, for county roadways, culverts and cross drains shall convey the runoff from a 25-year, 24-hour storm event.

Water Quality Standards: Policy 1-1.A: For all land developments the Level of Service Standard shall be a twenty-five (25) year design storm of twenty-four (24) hour duration and detention shall be such that post-development runoff rates mimic pre-development runoff rates. Water quality standards shall be established by the State Water Policy as set forth in Rule 17-40.420, F.A.C. Individual residential lots shall not be required to conform to a specific standard if the development in which the lot is located meets the applicable standard. The Land Development Regulations may permit an exception to the strict application of the standards in this policy for certain single family and duplex units, consistent with the provisions in the third paragraph of this policy.

Stormwater management systems shall also be required to meet the design and performance standards established in Chapter 17-25, Rule 17-25.025, and Rule 17-25.035, F.A.C., with on-site treatment of the first inch of run-off to meet water quality standards required by Chapter 17-302, Section 17-302.500. Stormwater discharge facilities must be designed so as to not degrade the receiving water body below the minimum conditions necessary to assure the suitability of water for the designated use of its classification as established in Chapter 17- 302, F.A.C. The Land Development Regulations shall provide that all water quality and discharge standards cited in this policy shall be applied to all development and redevelopment activities, irrespective of exceptions which are contained in the cited regulations.

Individual single family and duplex lots which are not part of a subdivision, or which exist as isolated vacant lots within developed subdivisions (and would therefore constitute infill), shall utilize standardized swales or other detention/retention facilities, based on professionally accepted and applied engineering principals and standards, which ensure that the adopted water quality and quantity standards are met.

GOAL 5: Adequate stormwater drainage will be provided to afford protection from flooding, and to prevent degradation of quality of receiving waters, consistent with State water quality rules.

Objective 5: The County/City Land Development Regulations shall provide for protection of natural drainage features and ensure that future developments provide adequate stormwater drainage facilities in accordance with the following policies

Policy 5-2: As part of the Land Development Regulations the County/City shall restrict development in flood prone areas. The regulations shall restrict the following within the 100 year floodplain: fill, structures, common water supplies or sewage treatment facilities roads, agriculture, silviculture and residential structures. The regulations shall protect the functions of flood prone areas through its requirement that flood areas are to be treated as wildlife habitat, and as water recharge and discharge resources.

Policy 5-4: The County shall require that adopted levels of service for stormwater management be provided for all new development, at the developer's expense. The

developer's engineer shall be required to prove the standards are being met for the new development by sealing the plans.

Policy 7-2: The Land Development Regulations shall limit impervious surface ratios for new development, and shall require management of stormwater to ensure post-development runoff does not exceed predevelopment runoff rates.