

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 Suwannee 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 Suwannee 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

Suwannee 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 goals, objectives, and policies that support risk reduction from predominantly flood and sinkhole 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 through which Suwannee County can continue to reduce or eliminate risks from flooding, wildfire, and sinkholes. 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, wildfire and sinkholes. 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, 1,313 acres are susceptible to 100-year flood, 2,669 acres are susceptible to wildfire, and 450 acres are susceptible to sinkholes.

Flood

About 2% of the 1,313 vacant acres in the 100-year floodplain are to be developed for residential, commercial, industrial uses or public facilities, indicating that these risk reduction strategies should be considered prior to development of this vacant land.

- The Comprehensive Plan should continue to include policies pertaining to the Suwannee River System 100-Year Floodplain Special Planning Area.
- The County should continue to give priority to those projects listed on the LMS project list.
- 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 the County maintain an inventory of environmentally sensitive areas which shall include 100-year floodplains.
- The County should continue to identify floodplains for acquisition under existing programs.
- The County should continue to adopt or amend land development regulations which limit the density of dwelling units within FEMA designated 100-year floodplains such that existing flood storage is maintained and allowable densities do not create potential flood hazards, or degrade the natural functions of the floodplain.
- The County should continue to require that all structures built in the 100-year floodplain include at least one foot freeboard.
- The Comprehensive Plan should consider prohibiting septic tanks in flood hazard areas or wetlands.
- The County should consider including a policy to not approve variances to required flood elevations.
- The County should consider establishing an impact fee and/or other equitable user-oriented revenue sources for the construction of drainage facilities, either county-wide or in districts of high flooding potential.
- 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.
- The Comprehensive Plan should consider policies that include preparation of a stormwater master plan to further mitigate the impacts of flooding in the community. This should be listed as a prioritized project on their LMS project list for possible funding sources such as FEMA's Hazard Mitigation Grant Program.

Wildfire

About 6% of the 2,669 vacant acres that are susceptible to wildfire are to be developed for residential, commercial, industrial uses or public facilities, indicating that these risk reduction strategies should be considered prior to development of this vacant land.

- Where reasonable, the County should consider creating a policy in the Comprehensive Plan to update the Land Development Regulations for the County to include wildfire mitigation principles, such as defensible space buffering surrounding development or multiple exits for large development. This could also include provisions for vegetation maintenance and the required removal of exotic vegetation or land cover that could be conducive to wildfire.
- The County should consider including policies for coordination with area volunteer fire departments to ensure fire protection is provided to all areas of the County.

- The County should consider participating in the Firewise Medal Community program to reduce risks within the wildland urban interface.
- 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.

Sinkholes

About 2% of the 450 vacant acres that are susceptible to sinkholes are to be developed for residential, commercial, industrial uses or public facilities, indicating that these risk reduction strategies should be considered prior to development of this vacant land.

- The County should continue to designate appropriate setbacks from sinkholes.
- The County should consider promoting PDR and TDR in areas highly susceptible to sinkholes.
- Through the Comprehensive Plan and/or the overlay zones, promote the use of cluster development to mitigate sinkhole hazards. In this way, the areas highly susceptible to sinkholes could be preserved as open space, while allowing other areas to be developed at a higher density.

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 floods, wildfires and sinkholes, and make them aware of proactive steps they can take to mitigate damage.
- Suwannee County has many measures being currently undertaken that serve to mitigate the impacts of hazards, however they have not been identified as beneficial in this area. Current growth management techniques such as firewise policies, clustering, conservation of floodplains and wetlands, elevating structures in special flood hazard areas and stormwater mitigation policies are employed by the community to protect natural features and to protect areas from natural hazards. Therefore, the County should update these policies in the Comprehensive Plan, emphasizing the benefits of hazard mitigation.
- The County should determine whether or not the conserved areas in the County have lifetime designations. In North Florida, some areas that were formally designated as uses with low densities are being slated for rural and urban development. It is

important to determine if and when, all of the conservation agreements end, in order to determine if additional actions can be taken in the Comprehensive Plan to ensure that the property is protected.

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.

- Include hazard maps with data layers to illustrate population (i.e., density) or property (i.e., value) exposure.
- Include a future land use map with hazard data layers (i.e., one FLUM per hazard) to illustrate which future land use categories are susceptible to each hazard.
- Include loss estimates by land use.
- Include a quantitative risk assessment for existing and future development (i.e., loss estimates by occupancy class and land use) or specific critical facilities.

Table of Contents

1. County Overview	6
2. Hazard Vulnerability	7
3. Existing Mitigation Measures	13
4. Comprehensive Plan Review	16
5. Data Sources	18
Attachments	A-1

1. County Overview

Geography and Jurisdictions

Suwannee County is located in north-central Florida 691.9 square miles, of which 687.6 square miles are land and 4.3 square miles are water. There are two incorporated municipalities within Suwannee County, as shown in **Table 1.1**. The City of Live Oak 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 Suwannee County and the percent change from the 2000 U.S. Census are presented in **Table 1.1**. Most residents live in unincorporated jurisdictions. Suwannee County has experienced significant population growth in recent years, a trend that is expected to continue. Between 1990 and 2000, Suwannee County had a growth rate of 30.1%, which exceeded the statewide average of 23.5% for the same time period.

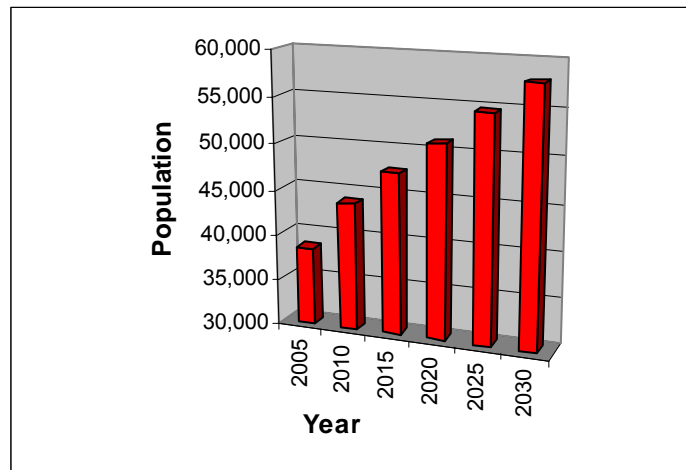
Table 1.1 Population Estimates by Jurisdiction

Jurisdiction	Population (Census 2000)	Population (Estimate 2004)	Percent Change 2000-2004	Percent of Total Population (2004)
Unincorporated	27,669	30,475	10.14%	80.81%
Branford	695	693	-0.29%	1.84%
Live Oak	6,480	6,545	1.00%	17.35%
Total	34,844	37,713	8.23%	100.00%

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

According to BEBR (2004), Suwannee County's population is projected to grow steadily and reach an estimated 57,800 by the year 2030, increasing the average population density of 55 to 84 persons per square mile. **Figure 1.1** illustrates medium growth population projections for Suwannee County based on 2004 calculations.

Figure 1.1 Population Projections for Suwannee County, 2005–2030



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

Of particular concern within Suwannee 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 37,713 persons residing in Suwannee County 16.9% are listed as 65 years old or over, 24% are listed as having a disability, 18.5% are listed as below poverty, and 7.3% live in a home where the primary language is other than English.

2. Hazard Vulnerability

Hazards Identification

The highest risk hazards for Suwannee County as identified in the County’s Local Mitigation Strategy (LMS) are tropical cyclone generated high winds, floods, and wildfire. Sinkholes were discussed in the LMS, and the risk was considered to be of medium probability for the entire county.

Hazards Analysis

The following analysis examines three hazard types: flood, wildfire, and sinkhole. 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 the FEMA’s designated 100-year flood zones (i.e., A, AE, V, VE, AO, 100 IC, IN, AH) for flood; and 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>).

Existing Population Exposure

Table 2.1 presents the population currently exposed to each hazard in Suwannee County. Of the 37,713 (U.S. Census 2000) people that reside in Suwannee County 7.9% are exposed to 100-year flooding, 18.9% are exposed to wildfire, and 12.5% are exposed to sinkholes. Of the 2,270 people exposed to wildfire, 48% are disabled.

Table 2.1 Estimated Number of Persons Exposed to Selected Hazards

Segment of Population	Flood	Wildfire	Sinkhole
Total (all persons)*	3,009	7,125	4,751
Minority	755	1,993	1,542
Over 65	485	1,582	742
Disabled	1,516	3,445	2,490
Poverty	674	1,504	1,187
Language-Isolated	0	0	0
Single Parent	265	487	372

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 Suwannee 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. Evacuees from coastal counties will likely evacuate to inland areas, seeking shelter in host counties such as Suwannee County. Thus, it is important to consider evacuation times for all counties in the region as shown in **Table 2.2**. As the population increases in the future, the demand for shelter space and the length of time to evacuate will increase, unless measures are taken now. Also, it should be noted that 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
Alachua	10.25	12	17.75	17.75	17.75
Bradford	18	18	18	18	18
Columbia	<i>Not Available</i>				
Gilchrist	6	6	8	8	10
Hamilton	<i>Not Available</i>				
Lafayette	<i>Not Available</i>				
Madison	8	8	8	8	8
Suwannee	<i>Not Available</i>				
Union	<i>Not Available</i>				

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 Suwannee 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 U.S. Army Corps of Engineers, and Florida Regional Planning Councils. The study dates range from 1995 to 2004. These regional studies are updated on a rotating basis with Northeast Florida region scheduled for completion in the fall of 2005.

Similar to most of Florida's coastal counties Suwannee County currently has a significant shelter deficit. According to Florida's Statewide Emergency Shelter Plan, Suwannee County has an existing shelter capacity of 355 people. The 2004 shelter demand for a Category 4 or Category 5 hurricane is 4,461 people, leaving an existing shelter deficit of 4,106. In 2009, the projected shelter demand is 4,990, leaving an anticipated shelter deficit of 4,635. This deficit is likely to be greater due to the influx of evacuees seeking shelter from nearby counties, as Suwannee is a host county. Therefore, it is essential that Suwannee 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. Suwannee County could encourage new homes to be built with saferooms, or 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 Suwannee County by occupancy type that are exposed to each of the four 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 Suwannee County’s existing structures to flood, wildfire, and sinkhole hazards was determined through MEMPHIS.

Table 2.3 Estimated Number of Structures Exposed to Selected Hazards

Occupancy Type	Flood	Wildfire	Sinkhole
Single Family	4,665	2,785	1,139
Mobile Home	1,442	1,470	335
Multi-Family	760	460	154
Commercial	928	346	259
Agriculture	5,798	1,958	231
Gov. / Institutional	519	1,380	390
Total	14,112	8,399	2,508

Source: Mapping for Emergency Management, Parallel Hazard Information System

There are 25,019 structures exposed to at least one of the three hazards, of which most are single-family homes in subdivisions. Of these structures, 56% are exposed to flood. There are over 14,000 structures are located within the 100-year floodplain, of which 33% are single-family homes, and 10% are mobile homes. According to the latest National Flood Insurance Program Repetitive Loss Properties list, as of March 2005, there are nine repetitive loss properties in Suwannee 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.”

About 33.5% or 8,339 structures are exposed to wildfire, of which 33% are single-family homes. The County is 80% rural, and the exposure to agriculture, people and property exist throughout the county. The vegetation that remains or grows back after these homes have been built could allow wildfires to spread from the rural parcels into neighborhoods. About 10% or 2,508 structures are located within sinkholes susceptible areas, of which 45% are single-family homes.

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, 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, sinkholes, 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, as of 1995, was acquired from the Florida Land Use, Cover and Forms Classification System (FLUCCS) provided by the Florida Department of Environmental Protection/Suwannee River Water Management District. DCA also tabulated the total amount of acres and percentage of land in the identified hazard exposure areas sorted by their future land use category according to the FLUCCS data, as well as the amount of these lands listed as vacant according to existing land use. Suwannee County future land use data was acquired in February 2001 from the North Central Florida Regional Planning Council 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 1995 FLUCCS geographic information system (GIS) shapefiles. Maps of future land uses in hazard areas were developed using the Suwannee County future land use map dated February 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 flood zones in relation to the 100-year flood, wildfire susceptible areas, and sinkhole susceptible areas.

In **Attachment A**, 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 Suwannee River. The total amount of land in the special flood hazard area is 53,565.4 acres. As shown in **Table 2.4**, 68.5% are in agricultural use; 20.6% are parks, conservation areas and golf courses; and 2.5% are currently undeveloped. **Table 2.5** shows that of the 1,313.1 undeveloped acres, 86% has been designated as environmentally sensitive areas; and 8% is designated agricultural with less than one dwelling unit per five acre. The County has taken favorable action in designating 86% of vacant acreage in the 100-year flood zone as environmentally sensitive area.

In **Attachment B**, two maps present the existing and future land uses within wildfire susceptible areas. These areas are scattered across the county. The total amount of land in the wildfire susceptible areas is 41,726.7 acres. As shown in **Table 2.4**, 74% are used for agriculture; 12% are used for low density residential; and 6.4% are undeveloped. **Table 2.5** shows that of the 2,668.5 undeveloped acres, 76.5% are designated agricultural with less than one dwelling unit per five acres, and 9.3% are for designated agricultural with less than one dwelling unit per two acres. The County should continue to take measures to reduce wildfire risk within the urban/rural interface.

In **Attachment C**, two maps present the existing and future land uses within sinkhole susceptible areas. These areas are primarily located in northwest and southwest of Live Oak, and east of Branford, though much of the land is agricultural. The total amount of land in the sinkhole susceptible areas is 2,1248 acres. As shown in **Table 2.4**, 77.6% are used for Agriculture; 6.9% are used for low density residential, and 2.1% are undeveloped areas. **Table 2.5** shows that of the 449.4 undeveloped acres, 55% are designated for agriculture with less than one dwelling unit per five acres; and 18.6% are designated for environmentally sensitive areas with residential with less than one dwelling units per 10 acres. The County has the opportunity to further research the vulnerability of the acreage designated for unknown purposes and development to determine if mitigation measures are necessary.

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

Existing Land Use Category		Flood Zones	Wildfire Susceptible Areas	Sinkhole Susceptible Areas
Agriculture	Acres	36,712.6	30,861.5	16,489.7
	%	68.5	74.0	77.6
Attractions, Stadiums, Lodging	Acres	30.1	16.9	17.4
	%	0.1	0.0	0.1
Places of Worship	Acres	17.4	2.7	19.8
	%	0.0	0.0	0.1
Commercial	Acres	153.2	2.5	216.2
	%	0.3	0.0	1.0
Government, Institutional, Hospitals, Education	Acres	37.9	2.2	70.4
	%	0.1	0.0	0.3
Industrial	Acres	9.6	0.7	40.4
	%	0.0	0.0	0.2
Parks, Conservation Areas, Golf Courses	Acres	11,052.9	1,307.3	787.6
	%	20.6	3.1	3.7
Residential Group Quarters, Nursing Homes	Acres	9.4	0.0	0.0
	%	0.0	0.0	0.0
Residential High-Density	Acres	18.9	0.9	11.8
	%	0.0	0.0	0.1
Residential Low-Density	Acres	1,556.3	5,016.1	1,462.0
	%	2.9	12.0	6.9
Residential Medium-Density	Acres	231.8	17.6	528.8
	%	0.4	0.0	2.5
Residential Mobile Home, or Commercial Parking Lot	Acres	471.3	1,444.4	392.1
	%	0.9	3.5	1.8
Submerged Land (Water Bodies)	Acres	1,653.0	77.8	31.0
	%	3.1	0.2	0.1
Transportation, Communication, Rights-Of-Way	Acres	223.4	108.1	553.5
	%	0.4	0.3	2.6
Utility Plants and Lines, Solid Waste Disposal	Acres	74.5	199.5	177.9
	%	0.1	0.5	0.8
Vacant	Acres	1,313.1	2,668.5	449.4
	%	2.5	6.4	2.1
Total Acres	Acres	53,565.4	41,726.7	21,248.0
	%	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		Flood Zones		Wildfire Susceptible Areas		Sinkhole Susceptible Areas	
		Total	Vacant	Total	Vacant	Total	Vacant
Agriculture - 1 (< 1 d.u. per 5 acres)	Acres	17,368.3	105.2	35,856.1	2,041.1	15,982.5	247.2
	%	32.4	8.0	85.9	76.5	75.2	55.0
Agriculture - 2 (< 1 d.u. per 2 acres)	Acres	249.5	16.3	989.8	247.9	144.5	0.0
	%	0.5	1.2	2.4	9.3	0.7	0.0
Commercial	Acres	83.2	4.2	171.2	58.9	122.4	30.3
	%	0.2	0.3	0.4	2.2	0.6	6.7
Conservation	Acres	2,930.2	0.0	248.3	0.0	81.6	0.0
	%	5.5	0.0	0.6	0.0	0.4	0.0
Environmentally Sensitive Areas - 1 (< 1 d.u. per 20 ac)	Acres	1,136.9	0.0	1,032.8	59.5	0.0	0.0
	%	2.1	0.0	2.5	2.2	0.0	0.0
Environmentally Sensitive Areas - 2 (< 1 d.u. per 10 ac)	Acres	28,346.4	1,129.4	1,428.5	101.0	1,161.5	83.8
	%	52.9	86.0	3.4	3.8	5.5	18.6
Highway Interchange	Acres	163.4	0.0	139.3	2.0	243.4	0.0
	%	0.3	0.0	0.3	0.1	1.1	0.0
Industrial	Acres	62.0	1.6	47.5	5.1	106.1	12.5
	%	0.1	0.1	0.1	0.2	0.5	2.8
None	Acres	1,031.3	32.8	288.5	52.2	1,440.1	10.9
	%	1.9	2.5	0.7	2.0	6.8	2.4
Public	Acres	154.0	0.0	65.1	16.3	63.3	4.9
	%	0.3	0.0	0.2	0.6	0.3	1.1
Recreation	Acres	1,227.9	0.0	517.0	0.0	175.2	0.0
	%	2.3	0.0	1.2	0.0	0.8	0.0
Residential - 1 (< 1 d.u. per acre)	Acres	436.3	0.9	885.5	75.1	1,727.5	59.7
	%	0.8	0.1	2.1	2.8	8.1	13.3
Residential - 2 (< 2 d.u. per acre)	Acres	0.0	0.0	23.0	0.0	0.0	0.0
	%	0.0	0.0	0.1	0.0	0.0	0.0
Residential - 4 (< 8 d.u. per acre)	Acres	348.2	19.8	28.5	5.8	0.0	0.0
	%	0.7	1.5	0.1	0.2	0.0	0.0
Residential - 5 (< 20 d.u. per acre)	Acres	27.6	2.9	5.6	3.6	0.0	0.0
	%	0.1	0.2	0.0	0.1	0.0	0.0
Total	Acres	53,565.2	1,313.1	41,726.7	2,668.5	21,248.1	449.4
	%	100.0	100.0	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 each of Suwannee County's two incorporated municipalities. These amounts are listed in **Table 2.6**. The intent of this table is to show the vacant acreage in hazard zones in each municipality, and to show the percentage of vacant acreage in each hazard zone for each municipality. In the total column for each hazard, the percentage for each municipality is the hazard zone acreage as a percent of total hazard acreage for all municipalities. In the vacant column for each hazard, the percentage for each 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.

Live Oak has the most acres in flood zones, as well as the largest proportion of flood zone acres out of its vacant land area. Live Oak also has the most acres in the wildfire susceptible areas, and the largest proportion of wildfire susceptible acres out of its vacant land area. Again, Live

Oak has the most acres in sinkhole susceptible areas and the largest proportion of sinkhole susceptible acres out of its vacant land area.

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 Suwannee 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		Sinkhole Susceptible Areas	
		Total	Vacant	Total	Vacant	Total	Vacant
Branford	Acres	64.4	1.3	9.8	0.4	456.3	126.2
	%	6.3	0.3	3.2	0.2	30.2	28.2
Live Oak	Acres	964.8	436.3	297.2	214.9	1,054.5	320.8
	%	93.7	99.7	96.8	99.8	69.8	71.8
Total Municipal Acres	Acres	1,029.3	437.6	307.0	215.4	1,510.8	447.0
	%	100.0	100.0	100.0	100.0	100.0	100.0

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 Suwannee County LMS (adopted in 2004) was assessed to determine if the hazard analysis and vulnerability assessment (i.e., 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). Future updates to the assessment will include working with Suwannee County to determine if the capital improvement projects are included in the LMS hazard mitigation project list.

Hazard Analysis and Vulnerability Assessment (Pages 2 – 64)

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

Strengths:

- Provides a hazards analysis and a quantitative vulnerability and risk assessment for each hazard.
- Provides information about demographic, income, and special needs population.
- Provides population (general and special needs) exposure to multi-hazards.
- Provides property exposure (building count and dollar value) within County land use categories to multi-hazards. Values are provided for damage classes (e.g., severe, moderate, etc.)
- Provides a description of geographic areas exposed to each of the hazards.
- Includes maps for each of the hazards.
- Includes loss estimates for each hazard by damage class within County land use categories.
- Includes a vulnerability of critical facilities that have been assigned a location vulnerability score for each hazard.

Weaknesses:

- Does not include loss estimates by occupancy class.
- Hazard maps do not include data layers to illustrate population (i.e., density) or property (i.e., value) exposure.
- Does not reference or include list or map of repetitive loss properties, but does have action items to elevate or acquire repetitive loss properties.
- Does not include a future land use maps that include hazard data layers to illustrate which future land use categories are susceptible to each hazard.

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 Suwannee County LMS Guiding Principles section contains a list of policies for the county and each municipality. They are categorized by those that address public health, safety and welfare; stormwater management; floodplain management; natural resource protection; land development regulations; infrastructure/critical facilities; construction codes; affordable housing; post-disaster development; hazards awareness; historical and cultural resources; governmental coordination; and disaster preparedness. 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.

LMS Goals and Objectives

The Suwannee County LMS has goals that support mitigation principles that are found in the comprehensive plan. A list of the LMS goals pertaining to comprehensive planning can be found in **Attachment D**. An assessment of whether the LMS goals and objectives are reflected in the comprehensive plan (and vice versa) is provided in **Table 5.1** as part of the preliminary recommendations. Final recommendations will result from a collaborative process between DCA, Suwannee County, and PBS&J. The following is a summary of the LMS goals that support comprehensive plan GOPs.

Goal 3 refers to maintaining current levels and rates of riverine erosion by limiting development within, and directing development away from the 100-year floodplains of rivers, streams and creeks.

Goal 4 supports minimizing damage to future buildings and infrastructure by identifying and mapping sinkholes and areas of known sinkhole formation and providing policy direction in local government comprehensive plans which limits and/or guides development away from such areas.

Goal 7 supports minimizing damage to existing and future buildings and infrastructure as a result of flooding.

Goal 8 supports Minimize damage to existing and future buildings and infrastructure as a result of wildfires.

Comprehensive Emergency Operations Plan (CEMP)

The Suwannee County CEMP Mitigation Annex references the LMS, and states that the LMS Working Group is responsible for developing strategies on guiding principles, hazard identification and vulnerability assessment and mitigation initiatives. The CEMP emphasizes that it is essential for both County and municipalities work together on mitigation planning activities to reduce the impact and cost of long term recovery and the CEMP ensures a high level of involvement by state and local government and the private sector. The CEMP notes that all pre-disaster mitigation priorities and projects are generated through the LMS. The CEMP 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, as well as pre-disaster mitigation programs such as the National Flood Insurance Program, Community Rating System Flood Mitigation Assistance Program, and public education and awareness on natural hazards mitigation techniques and funding mechanisms.

The document lists numerous activities and supporting agencies to assist in supporting mitigation in the County. All municipal planning departments are responsible to support pre- and post-disaster mitigation. The Department of Emergency Management and the Building Department primarily coordinate pre- and post-disaster hazard mitigation activities. As included in the LMS, proactive mitigation initiatives are accomplished through County ordinances, resolutions, zoning changes, financial incentives for hardening structures, the application of a stringent building code requirements, zoning changes, structural retrofits, stormwater management projects, the acquisition/demolition of repetitive loss or destroyed structures, and the FL DEM initiated shelter retrofit program. The CEMP also indicates that the County post-disaster development plan will fall within the guidelines of existing and proactive code requirements. Hazard mitigation funds will be used in accordance with the County Master Plan.

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)

Suwannee County is not required to develop a PDRP, but it is recommended.

National Flood Insurance Program/Community Rating System

Suwannee County, Live Oak and Branford participate in the National Flood Insurance Program (NFIP). The County participates in the NFIP Community Rating System (CRS) with a rating of 8.

4. Comprehensive Plan Review

Purpose and Intent

The Suwannee County Comprehensive Plan 2021 (Adopted June 2002; updated xxxx) was reviewed for the purpose of developing this profile. This review was undertaken in order to assess what steps Suwannee 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 Suwannee County as identified in the County's Local Mitigation Strategy (LMS) are floods, wildfires, and sinkholes for which the risk was considered to be of medium probability for the entire county. Suwannee County Comprehensive Plan primarily focuses on the protection of environmentally sensitive areas and natural drainage features such as wetlands, floodplains, aquifer recharge areas and wellfields. Policies focus on close monitoring of these environmentally sensitive areas and on the implementation of strong development controls for development and stormwater management. Specific emergency management references related to the three hazards discussed are limited in the Plan.

Suwannee County is not a coastal county, so policies are not geared toward coastal management and coastal resource protection. There is an intergovernmental coordination component integrated into the Plan. This element primarily focuses on resource and infrastructure related coordination with surrounding agencies and jurisdictions and with the Suwannee River Water Management District.

Flooding

Flooding is addressed from two vantage points, the protection and restoration of natural resources, and protection of vulnerable populations and properties. There are several policies directed at minimizing flooding and stormwater runoff. Suwannee River System 100-year Floodplain Special Planning Area policies are incorporated as a section of the Future Land Use Element. This section of the plan includes policies geared toward the relationship between development and re-development and the protection of the Suwannee River System. Policies also center on locating development outside of the 100-year floodplain, in order to protect life and property from the flood hazard.

Stormwater concurrency requirements are discussed extensively in the Sanitary Sewer, Solid Waste, Drainage, Potable Water and Natural Groundwater Aquifer Recharge Element. There are detailed policies to prevent the exacerbation of stormwater issues brought on by new development. For example, there is a policy in place to ensure that post-development stormwater runoff is no greater than pre-development stormwater runoff. There are additional buffering and filtering requirements for existing and proposed developments aimed at mitigating for and preventing stormwater runoff.

Sheltering

As with many inland counties in Florida, in the event of a hurricane, Suwannee County may receive evacuees from coastal counties. Similar to most of Florida's coastal counties Suwannee County currently has a significant shelter deficit. According to Florida's Statewide Emergency Shelter Plan, Suwannee County has an existing shelter capacity of 355 people. The 2004 shelter demand for a Category 4 or Category 5 hurricane is 4,461 people, leaving an existing shelter deficit of 4,106. In 2009, the projected shelter demand is 4,990, leaving an anticipated shelter deficit of 4,635. This deficit is likely to be greater due to the influx of evacuees seeking shelter from nearby counties, as Suwannee is a host county. Therefore, it is essential that Suwannee 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.

Sinkholes

The Future Land Use Element, Conservation Element, and Sanitary Sewer, Solid Waste, Drainage, Potable Water and Natural Groundwater Aquifer Recharge Elements contain numerous policies that directly relate to sinkhole hazards, groundwater recharge and aquifer protection. Policies contain language to protect groundwater aquifer recharge areas by preventing drainage wells and sinkholes from being used for stormwater disposal. Policies also address stormwater treatment requirements to prevent aquifer recharge contamination. One of the maps included in the Future Land Use Map Series, identifies groundwater resources for the application of the high groundwater aquifer protection policy of the Sanitary Sewer, Solid Waste, Drainage, Potable Water and Natural Groundwater Aquifer Recharge Element.

Wildfire

Policies directly relating to the wildfire hazard were not found during this review.

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.

Sinkhole Hazard GIS Data

Source: Kinetic Analysis Corporation (2005)

- 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:

http://lmsmaps.methaz.org/lmsmaps/final_cty/

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.

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 the 100-year Floodplain

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

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

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

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

- **Goal 3.1** – *Maintain current levels and rates of riverine erosion by limiting development within, and directing development away from the 100-year floodplains of rivers, streams and creeks.*
- **Goal 4.1** – *Minimize damage to future buildings and infrastructure by identifying and mapping sinkholes and areas of known sinkhole formation and providing policy direction in local government comprehensive plans which limits and/or guides development away from such areas.*
- **Goal 7.1** – *Minimize damage to existing and future buildings and infrastructure as a result of flooding.*
- **Goal 8.1** – *Minimize damage to existing and future buildings and infrastructure as a result of wildfires.*

ATTACHMENT E
Suwannee County Comprehensive Plan Excerpts Pertaining to Hazard Mitigation

FUTURE LAND USE ELEMENT

OBJECTIVE I.1 The County shall continue to direct future population growth and associated urban development to urban development areas through the establishment of such urban development areas within this Comprehensive Plan upon the adoption of this Comprehensive Plan. The total area of all the County's urban development areas shall be limited to 10 percent of the total acreage within the County.

Policy I.1.6 The County's land development regulations shall be based on and be consistent with the following land use classifications and corresponding standards for densities and intensities within the designated urban development areas of the County.

ENVIRONMENTALLY SENSITIVE LAND USE

Lands classified as environmentally sensitive are areas which are considered in need of special planning and treatment regarding land development regulation; Lands classified as environmentally sensitive are not preservation areas, but land uses permitted within these areas are to provide mitigating measures to protect the natural functions of the County's environmentally sensitive areas as designated within this Comprehensive Plan as regionally significant areas; Environmentally Sensitive Areas are lands within the areas of the 100-year' flood, as designated by the Federal Emergency Management Agency, Flood Insurance Rate Map, dated January 6, 1988, which are located in the Santa Fe River Corridor, Suwannee River Corridor Segment II and III, Ichetucknee River and the stream to sink recharge areas as shown on the Future Land Use Plan Map of this Comprehensive Plan shall conform with the following densities:

Environmentally Sensitive Area - 1 ≤ 1 d.u. per 20 acres
Environmentally Sensitive Area - 2 ≤ 1 d.u. per 10 acres

All lots shall have a length to width ratio no greater than 3 to 1; In addition, the County's land development regulations shall prohibit the location of intensive agriculture (the term intensive agriculture means all areas of concentrated animal density generally associated with milking barns, feedlots, chicken houses and holding pens), non-residential uses such as industrial activities and commercial uses within these areas, although nonintensive agriculture (which means agriculture activity which does not meet the definition of intensive agriculture), resource-based activities, such as campgrounds of less than 100 campsites may be approved as special exceptions or special permits and shall be limited to an intensity of .25 floor area ratio, provided that such campgrounds within environmentally sensitive areas shall not be located within 5 miles from another campground, and within lands classified as environmentally sensitive, silviculture activities shall be allowed in accordance with the silviculture policies contained within the Conservation Element of this Comprehensive Plan and 3. The development shall provide a minimum of a 50 foot buffer from adjacent land uses, 75 foot undisturbed buffer from a perennial river, stream or creek and a minimum 50 foot setback from a lake, pond or wetland. This buffer may be a portion of the required undeveloped area; 4. The developed area shall be configured in such a manner as to permit continued agriculture and/or silviculture uses of the undeveloped area; 5. The development shall contain approximately the same ratio of uplands to wetlands contained in the undeveloped area; 6. The development shall have direct access to a paved road; and 7. All internal roads shall be so located in order to minimize the number of access points to external roadways. Further, provided that within the Environmentally Sensitive Area-2 category, dwelling units may be clustered on smaller lots with no lot being less than 5 acres, if the site is developed as a Planned Residential Development and a density of 1 dwelling unit per 10 acres is maintained on site, as follows: 1. The development shall maintain 50 percent of the total land area as an undeveloped area; 2. The development shall be compact and contiguous and shall not

be scattered throughout the development parcel. Building lots shall be located on the highest elevations on the site;

OBJECTIVE I.3 In order that adjacent land uses are not adversely impacted by any change in land use, a landscaped buffer of not less than 10 feet wide shall be required along the affected rear and/or side yards of the site which abuts land within a residential land use category. In addition, such land uses shall provide within this buffer a landscaping which shall be designed, planted and maintained as to be 80 percent or more opaque between 2 and 6 feet above average ground level when viewed horizontally. A masonry or Wood opaque structure may be substituted for the landscaped buffer.

Policy I.3.6 National Flood Insurance Program requirements shall be included within the County's land development regulations, to apply to all development within the areas of special flood hazard, floodways, areas of shallow flooding.

Policy I.3.9 The County shall participate in the National Flood Insurance Program and regulate development and the installation of utilities in flood hazard areas in conformance with the programs requirements.

OBJECTIVE I.7 The County shall adopt regulations to protect natural resources arid environmentally sensitive lands (including but not limited to wetlands and floodplains) by April 1, 1992. For the purposes of this Comprehensive Plan "wetlands" means those areas that are inundated or saturated by surface water or groundwater at a frequency and a duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soils. Soils present in wetlands generally are classified as hydric or alluvial, or possess characteristics that are associated with reducing soil conditions. The prevalent vegetation in wetlands generally consists of facultative or obligate hydrophytic macrophytes that are typically adapted to areas having soil conditions described above. These species, due to morphological, physiological or reproductive adaptations, have the ability to grow, reproduce or persist in aquatic environments or anaerobic soil conditions. Florida wetlands generally include swamps, marshes, bayheads, bogs, cypress domes and strands, sloughs, wet prairies, riverine swamps and marshes, hydric seepage slopes, tidal marshes, mangrove swamps and other similar areas. Florida wetlands generally do not include longleaf or slash pine flatwoods with an understory dominated by saw palmetto.

Policy I. 7.3 The County shall protect high groundwater aquifer recharge areas identified in Appendix A of this Comprehensive Plan, by not issuing any development order or permit which allow stormwater disposal to drainage wells and sinkholes; requiring well construction modification and closure to be regulated in conformance with criteria established by the Water Management District and Florida Department of Health and Rehabilitative Services, (in particular, abandoned wells shall be closed in accordance with Chapter 17—2864E-8, Florida Administrative Code in effect upon adoption of this Comprehensive Plan);and prohibiting the discharge and requiring protection against accidental releases of hazardous or toxic materials to the soils or groundwater.

OBJECTIVE I.10 The County shall adopt maintain regulations by April 1, 1992 which regulate the location of development consistent with United States Department of Interior Geodetic Survey topographic information and soil conditions as identified within the United States Department of Agriculture Soil Conservation Service Natural Resources Conservation Service Soil Survey for the County.

Policy I.10.1 The County's land development regulations shall restrict development within unsuitable areas due to flooding, improper drainage, steep slopes, rock formations and adverse earth formations.

OBJECTIVE I.12 The County shall adopt maintain innovative land development regulations which shall include planned residential development regulations by April 1, 1992. The purpose of the Planned Residential Development regulations is to permit Planned Residential Developments within both the designated urban development areas and rural areas of the County which are intended to (1) encourage the development of land as planned residential developments; (2) encourage flexible and creative concepts of site planning; (3) preserve the natural amenities of the land by encouraging scenic and function open areas; (4) accomplish a more desirable environment than would be possible through the strict application of the minimum requirements of zoning and subdivision requirements; (5) provide for an efficient use of land resulting in smaller networks of utilities and streets and thereby lowering development and housing costs; and (6) provide a stable environmental character compatible with surrounding areas.

Policy I.12.1 The County's land development regulations shall contain specific and detailed provisions to manage future growth and development to implement the Comprehensive Plan which shall contain at a minimum the following provisions to:

1. Regulate the subdivision of land;
2. Regulate the use of land and water consistent with this Element and ensure the compatibility of adjacent land uses and provide for open space;
3. Protect environmentally sensitive lands identified within the Conservation Element;
4. Regulate areas subject to seasonal and periodic flooding and provide for drainage and stormwater management;
5. Protect potable water wellfields and aquifer recharge areas;
6. Regulate signage;
7. Ensure safe and convenient onsite traffic flow and vehicle parking needs; and
8. Provide that development orders and permits shall not be issued which result in a reduction of the level of service standards adopted in this Comprehensive Plan. Suwannee River System 100-year Floodplain Special Planning Area

OBJECTIVE S.1 To help ensure that development proposals and activities wholly or partially within the 100-year floodplain of the Suwannee River system are conducted in accordance with the physical limitations of this environmentally sensitive area, the County shall continue coordination provisions between the County and all agencies with jurisdiction within the 100-year floodplain of the Suwannee River system. Such coordination provisions shall provide a mechanism for all such agencies to review and make comment on such proposals or activities.

Policy S.1.1 The County shall request the Suwannee River Management District to provide a complete set of topographic maps delineating the 100-year and 10-year flood elevations within the County's jurisdiction along the Suwannee River system.

Policy S.1.2 The County shall notify the Suwannee River Water Management District of preliminary subdivision plats, site and development plans, rezoning or reclassification of lands, and special exception hearings within the 100- year floodplain of the Suwannee River system. The purpose of such notification is to provide opportunity for the District to coordinate, among appropriate agencies, the review and commenting on the potential impact of such plans or proposals on the natural resources of the Suwannee River system. The review and comment period shall be within the development review time frames established in the County's land development regulations.

Policy S.1.3 The review of preliminary subdivision plats and site and development plans within the 100-year floodplain of the Suwannee River system shall be based on the best available information regarding the physical characteristics of the site, including floodplain and wetlands delineation, soil conditions, vegetative cover, and critical wildlife habitat areas.

OBJECTIVE S.2 The County shall take the actions identified within the following policies by April 1, 1-992 to protect unique natural areas within the Suwannee River system, including but not limited to springs and spring runs, critical habitat areas for fish and wildlife, unique vegetative communities, and public recreation areas.

Policy S.2.1 The County's land development regulations shall provide for the evaluation of unique natural areas within the 100-year floodplain of the Suwannee River system during the development review process. The identification of such areas shall be based on the best available information provided by the Suwannee River Water Management District or other appropriate sources, including but not limited to land cover and vegetative mapping, resource investigations, and special site investigations. Strategies for protecting unique natural areas shall be coordinated with state and regional resource management agencies.

Policy S.2.2 The County shall require a 10 foot undisturbed regulated buffer along the property lines of public lands within the 100-year floodplain of the Suwannee River system for the purposes of visual screening, stormwater runoff and erosion control, public safety, and buffering potentially incompatible land uses. The width of such buffering shall be established using criteria within the land development regulations. Variations in the width of this buffer shall be made only for cases of undue hardship and on a site-specific review.

Policy S.2.3 The County shall participate in the acquisition planning process of state and regional agencies for lands and unique natural areas located within the 100-year floodplain of the Suwannee River system.

Policy S.2.4 The County shall annually monitor the use of County-owned facilities on or within the 100-year floodplain of the Suwannee River system to ensure that the public use of these facilities does not threaten the facility or adjacent natural resources. Such facilities shall be maintained in order to prevent any potential adverse impacts to the Suwannee River system such as erosion, release of inadequately treated stormwater or wastewater, or the accumulation of trash and debris.

Policy S.2.5 The County shall, upon adoption of this Comprehensive Plan designate publicly owned springs, spring runs, unique vegetative communities and critical habitats within the Suwannee River system as conservation on the Future Land Use Plan Map.

OBJECTIVE S.3 The County will regulate land use types, densities, and intensities for all lands within the 100-year floodplain of the Suwannee River system and will define and provide a mechanism to phase out nonconforming plated subdivisions which are unimproved and undeveloped, discontinue nonconforming uses, and bring nonconforming structures into compliance within the floodplain.

Policy S.3.1 The County hereby designates those lands within the County's jurisdiction lying within the 100-year floodplain of the Suwannee River system as an environmentally sensitive area.

Policy S.3.2 The areas within the 100-year floodplain, as designated by the Federal Emergency Management Agency, Flood Insurance Rate Map, dated January 6, 1988, of the Suwannee River system, which are located outside of the designated urban development areas shall conform with the densities specified within the Environmentally Sensitive Areas-1 and Environmentally Sensitive Areas-2 categories, provided that within the Environmentally Sensitive areas-2 category, dwelling units may be clustered on smaller lots with no lot being less than 5 acres if the site is developed as a Planned Residential Development and a density of 1 dwelling unit per 10 acres is maintained on site in accordance with the criteria listed in the land use classification policy of this element. In addition, the County's land development regulations shall prohibit the location of intensive agriculture (the term intensive agriculture means all areas of concentrated animal density generally associated with milking barns, feedlots, chicken houses and holding pens), non-residential uses such as industrial activities and commercial uses within these areas

(with the exception of water dependent commercial uses and resource based activities, such as campgrounds of less than 100 campsites may be allowed as special exceptions, provided that such campgrounds within environmentally sensitive areas shall not be located within 5 miles from another campground).

Policy S.3.3 The County shall, inside designated urban development areas within the 100-year floodplain of the Suwannee River System, limit dwelling unit density of residential uses to no greater than 1.0 dwelling units per acre in areas not served by centralized potable water systems and sanitary sewer systems. On-site sewage disposal systems shall conform to the standards as specified in Chapter 64E-6, Florida Administrative Code, in effect upon adoption of this policy. Development shall maintain the functions of the floodplain. Within the 100-year floodplain of the Suwannee River System, in order to amend the Future Land Use Plan Map to increase the dwelling unit density greater than 1.0 dwelling unit per acre, such areas shall be served and uses connected to centralized potable water and sanitary sewer systems. In no case shall such amendment permit a dwelling unit density greater than 2.0 dwelling units per acre. Each individual parcel shall conform to all applicable state and County regulations. In addition, new or expansion of designated urban development areas shall not be located within the 100-year floodplain of the Suwannee River System.

Policy S.3.4 The County shall prohibit development on the river berm by requiring a minimum undisturbed, vegetated buffer of seventy-five (75) feet measured from the generally recognized river bank of the Suwannee River and any other river of the Suwannee River System, and fifty (50) feet shall be required around all other streams tributary to the Suwannee River system, be maintained for all single-family residential uses and agricultural uses. Excepting single-family residential uses and agricultural, as provided for above, all other permitted land uses shall conform with the variable buffer requirements contained in Rule 40B-4,3030(4), F.A.C., as administered by the Suwannee River Water Management District in effect upon adoption of this policy. Exception shall be made for the provision of reasonable access to the river; resource-based recreational activities within buffer areas; and silviculture conducted in accordance with the silviculture policies contained within the Conservation Element of this Comprehensive Plan.

OBJECTIVE S.4 The County shall ensure that all development and redevelopment occurring in the 100-year floodplain of the Suwannee River system meet the building and design standards of the National Flood Insurance Program, the County, and the Suwannee River Water Management District.

Policy S.4.1 The County's land development regulations shall conform to the National Flood Insurance Program requirements for construction activities undertaken in the 100-year floodplain of the Suwannee River system.

Policy S.4.2 The County's land development regulations shall require all habitable structures be elevated no less than one foot above the 100-year flood elevation, provided that any such structures located in the floodway of the Suwannee River system shall be elevated without the use of fill materials.

Policy S.4.3 The County's land development regulations shall require all road construction and improvement projects within the 100-year floodplain of the Suwannee River system be designed in such a manner as to avoid any increase in floodway obstruction, any increase in the peak rate or volume of stormwater runoff, and any increase in pollutant loading to the receiving waters.

CAPITAL IMPROVEMENTS ELEMENT

DRAINAGE LEVEL OF SERVICE STANDARDS

The County hereby establishes the following level of service standards for drainage facilities:

Level Of Service Standard

For all projects not exempted from Chapter 40B-4 and 17-2562-25, Florida Administrative Code, in effect upon adoption amendment of this Comprehensive Plan within the County, stormwater management systems must be installed such that the peak rate of post development runoff will not exceed the peak-rate of pre-development runoff for storm events up through and including either: 1. A design storm with a 10-year, 24-hour rainfall depth with Soil Conservation Natural Resources Service Type II distribution falling on average antecedent moisture conditions for projects serving exclusively agricultural, forest, conservation, or recreational uses; or 2. A design storm with 100-year critical duration rainfall depth for projects serving any land use other than agricultural, silvicultural, conservation, or recreational issues. 3. Facilities which directly discharge into an Outstanding Florida Water shall include an additional level of treatment equal to the runoff of the first 1.5 inches of rainfall from the design storm consistent with Chapter 17-25.025(9)62-25.025(9), Florida Administrative Code, in effect upon adoption of this Comprehensive Plan, in order to meet the receiving water quality standards of Chapter 17-30262-302, Florida Administrative Code, in effect upon adoption of this Comprehensive Plan. Stormwater discharge facilities shall be designed so as not to lower the receiving water quality below the minimum conditions necessary to assure the suitability of water for the designated use of its classification as established in Chapter 17-30262-302, Florida Administrative Code, in effect upon adoption of this Comprehensive Plan.

Any development exempt from Chapter 17-2562-25 or 40B-4, Florida Administrative Code as cited above and which is adjacent to or drains into a surface water, canal, or stream, or which empties into a sinkhole, shall first allow the runoff to enter a grassed swale or other conveyance designed to percolate 80 percent of the runoff from a three year, one hour design storm within 72 hours after a storm event. In addition, any development exempt from Chapter 17-2562-25 or 40B-4, Florida Administrative Code, as cited above, which is directly discharged into an Outstanding Florida Water shall include an additional level of treatment equal to the runoff of the first 1.5 inches of rainfall from the design storm consistent with Chapter 17-25.025(9) 62-25.025(12), Florida Administrative Code, in effect upon adoption amendment of this Comprehensive Plan, in order to meet the receiving water quality standards of Chapter 17-302, F.A.C.62302, Florida Administrative Code. Stormwater discharge facilities shall be designed so as not to lower the receiving water quality below the minimum condition necessary to assure the suitability of water for the designated use of its classification as established in Chapter 17-30263-302, Florida Administrative Code, in effect upon adoption amendment of this Comprehensive Plan.

CONSERVATION ELEMENT

OBJECTIVE V.2 The County, in order to protect the quality and quantity of current and projected water sources, hereby establishes a 300 foot wellfield protection areas around community water system wells. In addition, the County in order to protect prime high groundwater aquifer recharge areas designated by the Water Management District and depicted in Appendix A of this Comprehensive Plan shall limit development in these areas as specified in Policy TV.5.2 the high groundwater aquifer recharge protection policy of the Sanitary Sewer, Solid Waste, Drainage, Potable Water and Natural Groundwater Aquifer Recharge Element of this Comprehensive Plan.

Policy V.2.5 The County shall, by April 1, 1992 through the development review process, require that post-development runoff rates and pollutant loads do not exceed pre-development conditions.

Policy V.2.6 The County's land development regulations shall require all new development to maintain the natural functions of environmentally sensitive areas, including but not limited to wetlands and 100-year floodplains so that the long term environmental integrity and economic and recreational value of these areas is maintained.

Policy V.2.7 The County shall provide for the regulation of development within 100- year floodplains of the Suwannee, Santa Fe and Ichetucknee Rivers by establishing these areas as Environmentally Sensitive in accordance with Policy 1.2.1 the land use classification policy contained in the Land Use Element of this Comprehensive Plan. In addition, in order to maintain the flood-carrying and flood storage capacities of the floodplains and reduce the risk of property damage and loss of life, by April 1, 1992, the County shall adopt flood damage prevention regulations and in the interim shall continue to enforce the provisions of the National Flood Insurance Program.

Policy V.2.11 The County shall limit development and associated impervious surfaces in high groundwater aquifer recharge areas designated by the Water Management District and depicted in Appendix A of this Comprehensive Plan, in accordance with the requirements stipulated in the high groundwater aquifer recharge policy contained in the Sanitary Sewer, Solid Waste, Drainage, Potable Water and Natural Groundwater Aquifer Recharge Element of this Comprehensive Plan in order to maintain the natural features of these areas.

Policy V.2.12 The County as part of the development review process shall require the maintenance of the quantity and quality of surface water runoff within natural drainage basins.

OBJECTIVE V.4 The County shall continue to include within the land development regulations, best management practices for the conservation, appropriate use and protection of fisheries, wildlife and wildlife habitats, identify, as provided in the critical wildlife habitat policy of this element, and protect native wildlife and their habitats, including state and federally protected plant and animal species (endangered, threatened and species of special concern), within proposed development sites and protect these natural resources from the impacts of development by the use of the Florida Fish and Wildlife Conservation Commission Critical Wildlife Conservation Areas, Florida Natural Areas Inventory, and North Central Florida Strategic Regional Policy Plan Regionally Significant Natural Resources map series to identify habitats which potentially contain endangered, threatened or species of special concern, and rare or unique vegetative communities prior to granting development approval.

Policy V.4.3 The County shall consult with the Florida Fish and Wildlife Conservation Commission prior to the issuance of a development order where there is an indication that such issuance would result on an adverse impact to any endangered or rare species. All new development will maintain the natural functions of environmentally sensitive areas, including but not limited to wetlands and 100-year floodplains so that the long term environmental integrity and economic impact and recreation value of these areas is maintained.

Policy V.4.4 The County shall address during the development review process the mitigation of development activities within environmentally sensitive areas, which include but are not limited to those areas identified as environmentally sensitive areas, on the Future Land Use Plan Map of this Comprehensive Plan to ensure that the possible impacts created by the proposed development activity will not significantly alter the natural functions of these significant natural resources. All new development will maintain the natural functions of environmentally sensitive areas, including but not limited to wetlands and 100-year floodplains so that the long term environmental integrity and economic impact and recreation value of these areas is maintained.

OBJECTIVE V.5 The County, in order to protect significant natural resources in a manner which is in conformance with and furthers the North Central Florida Strategic Regional Policy Plan, as amended August 28, 1997, hereby adopts the following maps as they apply to the unincorporated areas of the County as part of the Future Land Use Map Series of this Comprehensive Plan; (1) Regionally Significant Natural Resources - Ground Water Resources, dated May 23, 1996; (2) Regionally Significant Natural Resources - Natural Systems, dated August 28, 1997; (3) Regionally Significant Natural Resources - Planning and Resource Management Areas, dated May 23, 1996; (4) Regionally Significant Natural Resources - Planning and Resource Management Areas (Surface Water Improvement

Management Water Bodies), dated May 23, 1996; and (Regionally Significant Natural Areas - Surface Water Resources dated May 23, 1996. The following policies provide direction for the use of these maps in applying the referenced policies of this Comprehensive Plan.

Policy V.5.1 The map entitled Regionally Significant Natural Resources – Ground Water Resources, dated May 23, 1996, included within the Future Land Use Map Series, identifies groundwater resources for the application of the provisions of the high groundwater aquifer protection policy of the Sanitary Sewer, Solid Waste, Drainage, Potable Water and Natural Groundwater Aquifer Recharge Element of this Comprehensive Plan.

Policy V.5.4 The maps entitled Regionally Significant Natural Resources - Planning and Resource Management Areas (Surface Water Improvement Management Water Bodies), dated May 23, 1996, included within the Future Land Use Map Series identifies surface water management improvement water bodies for the application of the provisions of the surface water runoff policy of this element.

HOUSING ELEMENT

OBJECTIVE III.1 The County shall by April 1, 1992 provide for the allocation of at least 25 percent of the land use allocation which permit dwelling units to be provided to permit affordable housing such as mobile homes, for the existing and anticipated population.

Policy III.1.2 The County's land development regulations shall permit the construction of government subsidized housing only within areas which are served by public facilities which meet or exceed the adopted level of service standards established in the other elements of this Comprehensive Plan. In addition, government subsidized housing shall be prohibited within areas subject to the 100-year flood, as designated by the Federal Emergency Management Agency, Flood Insurance Rate Map, Flood Prone Areas Map in FLUM Series.

SANITARY SEWER, SOLID WASTE, DRAINAGE, POTABLE WATER AND NATURAL GROUNDWATER AQUIFER RECHARGE ELEMENT

Drainage Facility Sub-Element

OBJECTIVE IV.4 The County shall continue to coordinate the extension of, or increase in the capacity of drainage facilities by scheduling the completion of public facility improvements and requiring that they are concurrent with projected demand.

Policy IV.4.1 The County hereby establishes the following level of service standards for drainage facilities: LEVEL OF SERVICE STANDARD For all projects not exempted from Chapter 40B-4 and 172562-25, Florida Administrative Code, in effect upon adoption amendment of this Comprehensive Plan within the County, stormwater management systems must be installed such that the peak rate of post-development runoff will not exceed the peak-rate of pre-development runoff for storm events up through and including either: 1. A design storm with a 10-year, 24-hour rainfall depth with Soil Conservation Natural Resources Service Type II distribution falling on average antecedent moisture conditions for projects serving exclusively agricultural, forest, conservation, or recreational uses; or 2. A design storm with 100-year critical duration rainfall depth for projects serving any land use other than agricultural, silvicultural, conservation, or recreational issues. 3. Facilities which directly discharge into an Outstanding Florida Water shall include an additional level of treatment equal to the runoff of the first 1.5 inches of rainfall from the design storm consistent with Chapter 17-25.025(9)62-25.025(9), Florida Administrative Code, in effect upon adoption of this Comprehensive Plan, in order to meet the receiving water quality standards of Chapter 17-30262-302, Florida Administrative Code, in effect upon adoption of this Comprehensive Plan. Stormwater discharge facilities shall be designed so as not to lower the receiving water quality below the minimum conditions necessary to assure the suitability of water for the designated use of its classification as established in Chapter 17-30262-302, Florida Administrative Code, in effect upon adoption of this Comprehensive Plan. Any development

exempt from Chapter 17-2562-25 or 40B-4, Florida Administrative Code as cited above and which is adjacent to or drains into a surface water, canal, or stream, or which empties into a sinkhole, shall first allow the runoff to enter a grassed swale or other conveyance designed to percolate 80 percent of the runoff from a three year, one hour design storm within 72 hours after a storm event. In addition, any development exempt from Chapter 17-2562-25 or 40B-4, Florida Administrative Code, as cited above, which is directly discharged into an Outstanding Florida Water shall include an additional level of treatment equal to the runoff of the first 1.5 inches of rainfall from the design storm consistent with Chapter 17-25.025(9) 62- 25.025(9), Florida Administrative Code, in effect upon adoption amendment of this Comprehensive Plan, in order to meet the receiving water quality standards of Chapter 17-302, F.A.C. 62-30Z. Florida Administrative Code. Stormwater discharge facilities shall be designed so as not to lower the receiving water quality below the minimum condition necessary to assure the suitability of water for the designated use of its classification as established in Chapter 17-30263-302, Florida Administrative Code, in effect upon adoption amendment of this Comprehensive Plan.

Policy IV.4.2 The County shall prohibit the construction of structures or landscape alterations which would interrupt natural drainage flows, including sheet flow and flow to isolated wetland systems.

OBJECTIVE IV.6 The County shall require that, no sanitary sewer facility have any discharge of primary treated effluent into designated high groundwater aquifer recharge areas as designated by the Water Management District and depicted in Appendix A of this Comprehensive Plan.

Policy IV.6.1 The County shall require that during the development review process, all proposed development within the drainage basin of any designated priority water body shall be coordinated with the Water Management District and ensure that any proposed development is consistent with any approved management plans within that basin.

OBJECTIVE IV.7 The County shall require that, no sanitary sewer facility have any discharge of primary treated effluent into designated high groundwater aquifer recharge areas as designated by the Water Management District and depicted in Appendix A of this Comprehensive Plan.

Policy IV 7.1 The County's land development regulations shall provide for the limitation of development adjacent to natural drainage features to protect the functions of the feature, by establishing a design standard that require all development to conform to the natural contours of the land and natural drainage ways remain undisturbed. In addition, no development shall be constructed so that such development impedes the natural flow of water from higher adjacent properties across such development.

Policy IV.7.2 The County shall provide for the limitation of development and associated impervious surfaces in prime high groundwater recharge areas as designated by the Water Management District depicted in Appendix A of this Comprehensive Plan to protect the functions of the recharge area through requirement of the following: 1. Stormwater management practices shall not include drainage wells and sinkholes for stormwater disposal where recharge is into potable water aquifers. Where development is proposed in areas with existing wells, these wells shall be abandoned, including adequate sealing and plugging according to Chapter 17-28, Florida Administrative Code, in effect upon adoption of this Comprehensive Plan; 2. Well construction, modification, or closure shall be regulated in accordance with the criteria established by the Water Management District and the Florida Department of Health; 3. Abandoned wells shall be closed in accordance with the criteria established in Chapter 17-28, Florida Administrative Code, in effect upon adoption of this Comprehensive Plan; 4. No person shall discharge or cause to or permit the discharge of a regulated material as listed in Chapter 442, Florida Statutes, in effect upon adoption of this Comprehensive Plan, to the soils, groundwater, or surface water; and 5. No person shall tamper or bypass or cause or permit tampering with or bypassing of the containment

of a regulated material storage system, except as necessary for maintenance or testing of those components.

OBJECTIVE IV.9 The County shall include within the land development regulations a requirement that construction activity undertaken shall protect the functions of natural drainage features.

Policy IV.9.1 The County's land development regulations shall include a provision which requires a certification, by the preparer of the permit plans, that all construction activity undertaken shall incorporate erosion and sediment controls during construction to protect the functions of natural drainage features.