

Integrating Hazard Mitigation into Comprehensive Planning

Hendry County Profile

Florida Department of Community Affairs

Executive Summary

The experiences of the 2004 hurricane season epitomize the importance of better integrating hazard mitigation activities into local comprehensive planning. That fall, residents all over the state experienced significant damages from Hurricanes Charley, Frances, Jeanne, and Ivan as a result of winds, tornadoes, surge, and/or flooding. But this was not the only time we have experienced natural disasters, 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 firefighters' best efforts, 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 Hendry County Profile has been prepared as part of a statewide effort by the Florida Department of Community Affairs to guide local governments in integrating hazard mitigation principles into local Comprehensive Plans. Information provided in this profile will enable planners to (1) convey Hendry 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 be better integrated into the Comprehensive Plan; and (4) determine if any enhancements could be made to the Local Mitigation Strategy (LMS) to better support comprehensive planning. Best available statewide level data are provided to convey exposure and risk as well as illustrate the vulnerability assessment component of the integration process.

In this profile, we present an argument for why hazard mitigation needs to be a part of comprehensive planning through an examination of population growth, the hazards that put the County at risk, the special needs population and structures that could be affected by these hazards, and the distribution of existing and future land uses in different hazard areas. We hope that this analysis will serve as an example of the issues each jurisdiction should consider as they update their plans to include hazard mitigation. The profile also contains a review of the LMS and the Comprehensive Plan. Based on the analysis and review, we were able to develop specific options for the County on how to incorporate more hazard mitigation into the Comprehensive Plan and how to enhance the LMS so that it is also a better tool for local planners.

During our review, we found that Hendry County had many strengths regarding hazard mitigation in both its LMS and Comprehensive Plan, and these are outlined in the profile. There are always ways to further strengthen such plans, however, and the following is a summary of some of the options that would enable the County to do so.

HENDRY COUNTY GENERAL RECOMMENDATIONS

- Currently, the Office of Emergency Management, in coordination with the local Working Group, is responsible for maintenance of and updates to the Local Mitigation Strategy. The Planning Department staff could contribute in this process by increasing the linkages between the LMS and the Comprehensive Plan, with specific focus on land use. Clear directives for planning and emergency management staff to work together on hazard mitigation plans and ensure that the plan fully addresses all aspects of hazards could be included in the LMS, CEMP, and/or Comprehensive Plan.

- The County can include maps of applicable hazard zones overlaid on existing and future land uses as a component of the Future Land Use Map Series. Also, the Comprehensive Plan can reference the LMS as a source of data to be used in the EAR process and in considering land use amendments. The LMS could also include existing and future land uses on hazard maps, in addition to critical facilities. By using consistent data and showing linkages between the different plans, each plan will be stronger. Maps, such as the ones in this profile, provide useful visual knowledge on the relationship between land uses and hazard zones that can be used for planning mitigation or changes in future land use.
- The County can support a program in coordination with the LMS working group and other agencies, such as the South Florida Water Management District, to educate homeowners of mitigation techniques for protecting their structures against high winds, flood, wildfire, and sinkholes, where appropriate. A similar LMS initiative has been drafted which promotes building techniques that mitigate against the threat of lightening strikes and this could simply be expanded to address other hazards. As a member of the NFIP, Hendry County could undertake hazard mitigation education as a means of improving its CRS scores. One of the best ways to mitigate existing vulnerabilities is through education.
- The LMS prioritized project list is heavily reliant upon the Hazard Mitigation Grant Program. Considering the intense competition for statewide HMGP funds, the County could incorporate its LMS projects into the 5-year cycle of capital improvement projects in the Comprehensive Plan.
- The Hendry County LMS addresses the need to improve and expand its road network in order to improve countywide evacuation times. The Comprehensive Plan addresses traffic circulation without consideration for hazards. As the eastern half of Hendry experiences regional growth from the Ft. Myers area, the County could consider linking development permits to an LOS standard for evacuation times. This is considered a best management practice from *Protecting Florida's Communities* (FDCA, 2005b). Recognizing evacuations are a regional issue, the County could coordinate with the State Department of Transportation or seek assistance from local MPOs.
- The LMS states that the County intends to pursue funding to retrofit existing structures so they will meet State sheltering standards. In addition to this, the County can also encourage new residential developments to include a shelter in the development or build safe rooms into each home if not in a flood zone.
- The County could protect natural and cultural resources by locating cultural facilities away from hazard zones. The Comprehensive Plan discusses the county's approach to protecting significant sites and structures, but not in regard to hazards. The LMS could assess the vulnerability and risk of historic sites and structures to natural hazards. Also, the County could prioritize drainage projects that will protect historical structures, such as the numerous Native American mounds and historic military forts.
- The Comprehensive Plan addresses the ability of developers to cluster development at a higher density in order to reduce locating structures in hazardous areas. The LMS could add policies to reiterate the ability to mitigate hazards through land use and development decisions.
- Redevelopment is not addressed in either the Comprehensive Plan or the LMS. The County can address redevelopment in at-risk areas by only allowing post-disaster redevelopment to occur at the density/intensity of the land use designation currently in place. This is considered one of the best management practices from *Protecting Florida's*

Communities because it keeps vulnerable grandfathered-in land uses from continuing indefinitely. (FDCA, 2005b)

Flood Hazards

- The County has done an excellent job of recognizing the threat posed to the community by flooding. In addition to seasonal and coastal storm flooding, the county has a unique situation with the Herbert Hoover Dike System constraining Lake Okeechobee. Evaluating the existing land uses that coincide with the dam break inundation zones, which are mapped in the LMS, will allow planners to better consider hazard vulnerability and the siting of development.
- Much of the 100-year floodplain in Hendry County is designated agricultural on the future land use map, however, the Comprehensive Plan could strengthen this limitation to development in the floodplain by stating that infrastructure and other development subsidies will not be extended into such hazardous and environmentally sensitive areas.

Wildfire Hazards

- The County does not currently address wildfire mitigation in its Local Mitigation Strategy or in the Comprehensive Plan. The LMS should include an objective and some policies on wildfire mitigation such as developing a fuel reduction strategy in coordination with the Florida Department of Forestry or educating homeowners of mitigation techniques like defensible space. The Comprehensive Plan should also include policies to reduce wildfire vulnerability, such as encouraging firewise neighborhood design or requiring dry hydrants in rural areas that do not have adequate water supplies for fire-fighting..
- The County can require management plans for conservation areas that address reduction of wildfire fuels. Forests that are maintained, through prescribed fire or other mechanical means, will not become a wildfire risk to the nearby community.
- The County can adopt LDRs that limit residential development or require substantial defensible buffers in high-risk fire areas, such as those adjacent to conservation lands. This could become a larger issue in the future as Hendry County is able to acquire open space/ conservation acreage as stated in Objective 5.6 of their Comprehensive Plan. Limiting development or requiring adequate defensible space near conservation areas will assuage some of the liability and practical issues of using prescribed fire as a management practice.
- The County can require firewise neighborhood design as a condition of approval for subdivision or PUD in high-risk areas in the vicinity of LaBelle.
- The County can adopt a firewise building code before future development occurs in the wildland-urban interface. They could develop a wildfire risk overlay zone to limit the building code to only those areas with a high risk of wildfire. The majority of the County does not experience threat from wildfire, but the areas around the Town of LaBelle are particularly vulnerable as the town expands into formerly wooded uplands.

Sinkhole Hazards

- The County can restrict development through overlay zones or preservation districts in high-risk, karst-sensitive areas of the county. This is considered a best management practice from *Protecting Florida's Communities* (FDCA, 2005b). This is applicable along the Caloosahatchee River, southwest of LaBelle.

- The County can use buffers to prevent development from building too close to an existing sinkhole.
- In areas susceptible to sinkholes, the County can require a geotechnical evaluation be made prior to development approval. This will reinforce the soil suitability analysis which is currently required of the land development regulations by the Comprehensive Plan.

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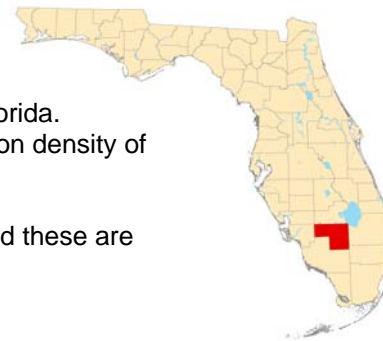
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1. County Overview

Geography and Jurisdictions

Hendry County is an interior county located in Southwestern Florida. It covers a total of 1,153 square miles with an average population density of 31.4 people per square mile (U.S. Census Bureau, 2000).

There are two incorporated municipalities within the County, and these are listed in **Table 1.1**.



Population and Demographics

Official 2004 population estimates for all jurisdictions within Hendry County as well as the percent change in population from the 2000 U.S. Census are presented in **Table 1.1**. The most current estimated countywide population of Hendry County is 37,394 people (University of Florida, Bureau of Economic and Business Research, 2004). The most populated city in Hendry County is Clewiston, but 70.3% of the countywide population lives in the unincorporated portion of the County. Between 1990 and 2000, Hendry County as a whole had a growth rate of 40.5%, which was much greater than the statewide growth rate of 23.5% in those 10 years (U.S. Census Bureau, 2000).

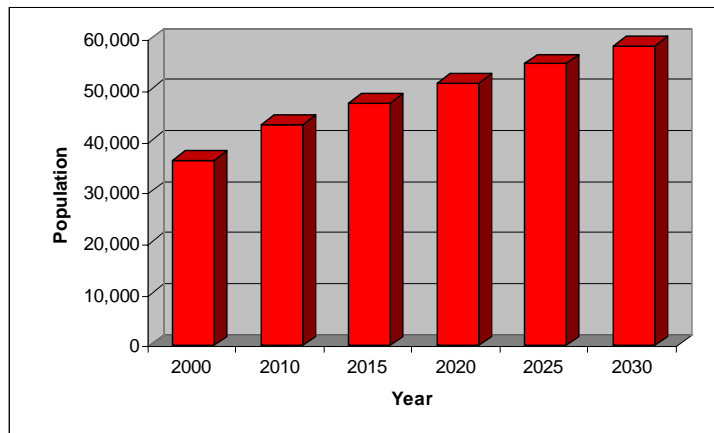
Table 1.1 Population Estimates by Jurisdiction

Jurisdiction	Population, Census 2000	Population Estimate, 2004	% Change, 2000-2004	% of Total Population (2004)
UNINCORPORATED	25,540	26,297	3.0%	70.3%
Clewiston	6,460	6,710	3.9%	17.9%
LaBelle	4,210	4,387	4.2%	11.7%
Countywide Total	36,210	37,394	3.3%	100.0%

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

According to the University of Florida, Bureau of Economic and Business Research (2004), Hendry County’s population is projected to grow steadily for the next 25 years, reaching 58,700 people by the year 2030. **Figure 1.1** illustrates medium population projections for Hendry County based on 2004 calculations.

Figure 1.1 Medium Population Projections for Hendry County, 2010-2030



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

Of particular concern within Hendry County’s population are those persons with special needs and/or limited resources such as the elderly, disabled, low-income, or language-isolated residents. According to the 2000 U.S. Census, 10.1% of Hendry County residents are listed as 65 years old or over, 20.0% are listed as having a disability, 24.1% are listed as below poverty, and 38.0% live in a home with a primary language other than English.

2. Hazard Vulnerability

Hazards Identification

The following are natural hazards that pose a risk for the County as identified in the County’s Local Mitigation Strategy (LMS): flooding, coastal storms, wildfire, tornadoes, thunderstorms and high wind events, dam break, drought, winter storms and freezes, and exotic pests and diseases (Hendry County, 2005, Risk Analysis, Section I-1). Sinkholes were considered to be a low risk for the county.

The County has experienced only three flooding events in the past ten years, though these are specifically associated with affects on the built environment, not the common sheet flows across agricultural lands and wetlands. The County has directly experienced (i.e., a storm within a 50-mile radius) more than eight tropical storms or hurricanes, most recently Wilma, in the past ten years. Each storm had reduced its wind velocity by the time Hendry County was affected by the associated gusts. There have been 39 recorded tornado events in Hendry County between 1950 and 2004 ranging from intensities of F0 to F3. Since 1999, 53 wildfires have been recorded in the county, with only three threatening the municipalities. (Hendry County, 2005)

Hazards Analysis

The following analysis looks at three major hazard types: flooding, sinkholes, and wildfire. All of the information in this section, except the evacuation and shelter estimates, 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 DMA2K revision project. It was created by Kinetic Analysis Corporation under contract with the Florida Department of Community Affairs (FDCA). Estimated exposure values were determined using the Federal Emergency Management Agency’s (FEMA’s) designated 100-year flood zones (A, AE, V, VE, AO, 100 IC, IN, AH), levels of concern 5 through 9 for wildfire, and high through adjacent risk zones for sinkholes. 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>) or your countywide LMS.

Existing Population at Risk

Table 2.1 presents the estimated countywide population at risk from hazards, as well as a breakdown of the sensitive needs populations at risk. The first column in the table summarizes the residents of Hendry County that live within FEMA Flood Insurance Rate Map zones that signify special flood hazard areas. According to these maps, 37.4% of the population, or 13,995 people, are within the 100-year flood zone. A majority of those at risk of flooding are either minority and/or disabled. These special-needs citizens require extra planning by local governments to ensure their safety. In Hendry County, sinkholes are a minor risk, with only 3.8% of the population is within a high to adjacent risk sinkhole zone. Wildfire puts the most people at risk in the County, with 53.7% of the population living in medium- to high-risk wildfire zones. Forty-eight percent of those at risk from wildfire are disabled or over 65 years old, possibly making a quick evacuation difficult.

Table 2.1 Estimated Number of Persons at Risk from Selected Hazards

Population	Flood	Sinkhole (high-adjacent risk)	Wildfire (medium-high risk)
Minority	4,690	62	5,690
Over 65	1,340	195	2,388
Disabled	3,684	706	7,303
Poverty	2,566	356	3,632
Language Isolated	790	0	0
Single Parent	925	93	1,054
Countywide Total	13,995	1,412	20,067

Source: Florida Department of Community Affairs, 2005a.

Evacuation and Shelters

As discussed in the previous sections, population growth in Hendry County has been steady, and this trend is projected to continue. As the population increases in the future, the demand for shelter space and the length of time it takes to evacuate the County is only going to increase. Currently, evacuation clearance times for Hendry County are estimated to be 6 hours for all categories of hurricanes, as shown in **Table 2.2**. These data were derived from 11 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 and are updated on a rotating basis. According to Rule 9J-5, counties must maintain or reduce hurricane evacuation times. Some experts have suggested that counties should try to achieve 12 hours or less clearance time for a Category 3 hurricane. This is due to the limited amount of time between the National Hurricane Center issuing a hurricane warning and when the tropical storm-force winds make landfall. Hendry County is easily able to meet this recommendation, but with continued growth in the future and the limited road network of the region, they should not become complacent. Additionally, storm events requiring evacuation typically impact larger areas, often forcing multiple counties to issue evacuation orders and placing a greater number of evacuees on the major roadways, further hindering evacuation progress. Thus, it is important to not only consider evacuation times for Hendry County, but also for other counties in the region as shown in **Table 2.2**.

**Table 2.2 County Evacuation Clearance Times in Hours
(High Tourist Occupancy, Medium Response)**

County	Hurricane Category				
	1	2	3	4	5
Desoto	18	18	18	18	18
Glades	3	3	3	9	9
Hardee	5	5	5	5	5
Hendry	6	6	6	6	6
Highlands	2	2	2	2	2
Polk	13	13	13	13	13

Note: Best available data as of 7/05 Source: State of Florida, 2005
(some counties may be in the process of determining new clearance times)

Coupled with evacuation is the need to provide shelters. If adequate space can be provided in safe shelters for Hendry County residents, then this could be a partial solution to increasing clearance times for evacuation. Currently, the State Shelter Plan reports that there is space for 4,004 people in the County’s shelters, and there are 2,218 more people that will need sheltering in the case of a Category 5 hurricane. It is projected that by 2009 the deficit will increase to 3,303 people in need of space (FDCA, 2004). The County will need to address this deficiency but might also try to decrease the demand for public shelters by encouraging new homes to be built with safe rooms if they are outside of flood zones. County residents who are not located in a flood zone could shelter in place if they had a safe room that could withstand hurricane-force winds. Safe rooms could at least be a last option for residents who cannot evacuate in time, especially in the case of a tornado. Also, as an interior county, Hendry should consider the potential influx of coastal county residents seeking shelter and could work on agreements for providing shelter space.

Existing Built Environment

While the concern for human life is always of utmost importance in preparing for a natural disaster, there also are large 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 recover from a disaster. **Table 2.3** presents estimates of the number of buildings in Hendry County by structure type that are at risk from each of the three hazards being analyzed.

Flooding presents the largest risk to property in the County, with 13,165 structures within a flood zone. The structures at risk are predominantly single-family or mobile homes. However, , there are no homes in Hendry County listed in the latest National Flood Insurance Program Repetitive Loss Properties Database.

Table 2.3 also shows 176 structures within high to adjacent risk sinkhole areas, with the majority (55.1%) of those structures being governmental and institutional structures. Single-family and mobile homes are the most at risk from wildfire, with 59.3% of the total 10,063 structures at risk being these residences.

Table 2.3 Estimated Number of Structures at Risk from Selected Hazards

Structure Type	Flood	Sinkhole (high-adjacent risk)	Wildfire (medium-high risk)
Single-Family Homes	4,211	60	3,215
Mobile Homes	2,556	8	2,749
Multi-Family Homes	1,484	10	899
Commercial	1,241	0	751
Agriculture	1,506	1	1,340
Gov./Institutional	2,167	97	1,109
Total	13,165	176	10,063

Source: Florida Department of Community Affairs, 2005a.

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 not only the people and property in a hazard area, but also the probability of occurrence that is necessary to understand the impacts to people and property. 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 in considering where to implement risk reducing comprehensive planning measures.

Analysis of Current and Future Vulnerability

The previous hazards analysis section discussed population and existing structures at risk from flooding, sinkholes, and wildfire according to MEMPHIS estimates. This section demonstrates the County’s vulnerabilities to these hazards spatially and in relation to existing and future land uses. The following maps and tabulations of existing land use within hazard areas are based on the 2004 geographic information system (GIS) shapefiles from the Hendry County Property Appraiser and the Florida Department of Revenue. Maps and tabulations of future land uses in hazard areas were developed using the Hendry County future land use map obtained January 2005.

In **Attachment A**, two maps present the existing and future land uses within the 100-year flood zone. A majority of the county is flood-prone due to the low lying topography southwest of Lake Okeechobee. The total amount of land in these special flood hazard areas is 646,311 acres for the unincorporated County. As shown in **Table 2.4**, only 7.7% of these acres are currently vacant. The majority of flood prone land is currently used for agriculture or parks and conservation, 70.9% and 17.4% respectively. **Table 2.5** shows that 84.8% of the flood prone acres are designated for agricultural use, with an additional 11.9% slated for agriculture conservation. Only a very small percentage of the flood zone is designated for development, with a mere 1.1% of undeveloped land allowing medium- or high-density residential development. Hendry’s rural preservation is commendable and if continued will preserve the county’s low vulnerability to flooding despite the widespread presence of the floodplain throughout the county.

In **Attachment B**, maps present the land uses associated with high-risk wildfire zones. There are small pockets of wildfire susceptible land scattered throughout the County, with a large concentration around LaBelle. A total of 28.1% of the land within these wildfire zones is currently vacant, as shown in **Table 2.4**. Of those 18,740 undeveloped acres, 68.6% is shown to be designated for Agriculture or Agriculture Preservation in the future (**Table 2.5**). Another 28.6% of the undeveloped wildfire susceptible areas are designated for future rural residential use, which will increase Hendry County’s vulnerability to wildfire hazards. Large-lot residential development

is the most at risk since these homes typically are surrounded by wooded lots and often do not have enough defensible space to stop a wildfire from spreading throughout the neighborhood.

Attachment C includes maps of potential sinkhole areas in the County. An area along the Caloosahatchee River (Canal C-43) southwest of LaBelle is the only part of the county with a high to adjacent risk from sinkholes. As **Table 2.4** shows, there are 1,285 acres within this hazard zone. Currently, 42.4% is used for agriculture, 24.1% is in residential use, 3.8% is used for government or institutional purposes, and 29.2% is undeveloped. Of the undeveloped 376 acres at risk, 188 acres are designated for future residential use and another 188 acres are designated for agricultural use (**Table 2.5**). This means that the potential persons and property at risk could increase, depending on densities and structural siting. Since this is such a small area with a potential for sinkholes, property owners could easily be encouraged to test the area before building there.

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

Existing Land Use Category		Flood Zones	Wildfire Susceptible Areas	Potential Sinkhole Areas
Agriculture	Acres	457,915.8	21,590.3	544.6
	%	70.9	32.4	42.4
Attractions, Stadiums, Lodging	Acres	38.3	2.0	0.0
	%	0.0	0.0	0.0
Places of Worship	Acres	169.0	219.8	0.0
	%	0.0	0.3	0.0
Commercial	Acres	996.5	180.8	0.0
	%	0.2	0.3	0.0
Government, Institutional, Hospitals, Education	Acres	14,008.9	11,521.9	49.3
	%	2.2	17.3	3.8
Industrial	Acres	757.3	64.0	0.0
	%	0.1	0.1	0.0
Parks, Conservation Areas, Golf Courses	Acres	112,363.4	7,001.6	0.0
	%	17.4	10.5	0.0
Residential Group Quarters, Nursing Homes	Acres	275.5	106.8	0.0
	%	0.0	0.2	0.0
Residential Multi-Family	Acres	579.2	387.0	26.8
	%	0.1	0.6	2.1
Residential Mobile Home, or Commercial Parking Lot	Acres	6,629.9	4,143.2	128.0
	%	1.0	6.2	10.0
Residential Single-Family	Acres	2,357.7	2,369.5	154.7
	%	0.4	3.6	12.0
Transportation, Communication, Rights-of-Way	Acres	261.3	48.6	6.2
	%	0.0	0.1	0.5
Utility Plants and Lines, Solid Waste Disposal	Acres	250.1	199.3	0.0
	%	0.0	0.3	0.0
Vacant	Acres	49,708.5	18,740.8	375.6
	%	7.7	28.1	29.2
Total Acres	Acres	646,311.4	66,575.6	1,285.2
	%	100.0	100.0	100.0

Table 2.5 Total and Undeveloped Acres in Hazard Areas by Future Land Use Category for the Unincorporated County

Future Land Use Category		Flood Zones		Wildfire Susceptible Areas		Potential Sinkhole Areas	
		Total	Undev.	Total	Undev.	Total	Undev.
Agriculture	Acres	547,905.8	33,890.3	44,296.9	10,489.3	649.4	187.5
	%	84.8	68.2	66.5	56.0	50.5	49.9
Agriculture Conservation	Acres	76,698.4	8,001.6	10,949.9	2,369.5	0.0	0.0
	%	11.9	16.1	16.4	12.6	0.0	0.0
Commercial	Acres	222.9	55.7	94.5	25.4	0.0	0.0
	%	0.0	0.1	0.1	0.1	0.0	0.0
Industrial	Acres	852.5	22.1	11.4	8.9	0.0	0.0
	%	0.1	0.0	0.0	0.0	0.0	0.0
Public	Acres	2,891.2	76.2	216.7	4.5	8.9	0.0
	%	0.4	0.2	0.3	0.0	0.7	0.0
Recreational	Acres	99.0	41.5	120.2	22.3	0.0	0.0
	%	0.0	0.1	0.2	0.1	0.0	0.0
Recreational Leisure	Acres	272.4	43.0	189.7	31.7	0.0	0.0
	%	0.0	0.1	0.3	0.2	0.0	0.0
Residential, High Density	Acres	824.6	171.2	88.7	7.8	0.0	0.0
	%	0.1	0.3	0.1	0.0	0.0	0.0
Residential, Low Density	Acres	44.6	0.0	127.3	0.0	0.0	0.0
	%	0.0	0.0	0.2	0.0	0.0	0.0
Residential, Medium Density	Acres	2,423.7	390.1	388.1	57.7	0.0	0.0
	%	0.4	0.8	0.6	0.3	0.0	0.0
Residential, PRE-Existing Rural Estate	Acres	8,296.8	4,632.7	4,757.1	2,709.3	396.8	126.4
	%	1.3	9.3	7.1	14.5	30.9	33.7
Residential, Rural Estate	Acres	271.5	55.7	358.0	78.5	230.1	61.8
	%	0.0	0.1	0.5	0.4	17.9	16.5
Residential, Special Density and Use	Acres	2,658.2	1,435.7	4,379.0	2,519.3	0.0	0.0
	%	0.4	2.9	6.6	13.4	0.0	0.0
Transitional	Acres	2,849.9	892.6	598.1	416.7	0.0	0.0
	%	0.4	1.8	0.9	2.2	0.0	0.0
Total	Acres	646,311.5	49,708.5	66,575.6	18,740.8	1,285.2	375.6
	%	100.0	100.0	100.0	100.0	100.0	100.0

Table 2.6 presents the total numbers of acres in a hazard zone in Hendry County's incorporated areas and how many of those acres are currently undeveloped. Clewiston is located along the shores of Lake Okeechobee, and as such, the town has more than 500 acres located in the 100-year floodplain. Only a small amount of those lands, 13%, have not yet been developed. Clewiston is not susceptible to wildfire or sinkholes. LaBelle has 439 acres located in a flood zone and 335 acres susceptible to wildfire, but it does not have a high risk from sinkholes. Fortunately, more than a third of the at-risk acreage in each category is not developed, providing an opportunity for mitigation.

Table 2.6 Total and Vacant Incorporated Acres in Hazard Areas

Jurisdiction		Flood Zones		Wildfire Susceptible Areas		Sinkhole Susceptible Areas	
		Total	Vacant	Total	Vacant	Total	Vacant
Clewiston	Acres	525.0	68.0	0.0	0.0	0.0	0.0
	%	100.0	13.0	0.0	0.0	0.0	0.0
LaBelle	Acres	438.7	164.7	335.1	119.3	0.0	0.0
	%	100.0	37.6	100.0	35.6	0.0	0.0
Total Acres	Acres	963.7	232.7	335.1	119.3	0.0	0.0
	%	100.0	24.1	100.0	35.6	0.0	0.0

3. Existing Mitigation Measures

Local Mitigation Strategy

The LMS is an ideal repository for all hazard mitigation analyses, policies, programs, and projects for the County and its municipalities due to its multi-jurisdictional and intergovernmental nature. The LMS identifies hazard mitigation needs in a community and structural or non-structural initiatives that can be employed to reduce community vulnerability. Communities can further reduce their vulnerability to natural hazards by integrating the LMS analyses and mitigation objectives into their Comprehensive Plans.

An LMS prepared pursuant to the State's 1998 guidelines has three substantive components (FDCA, 2005b):

Hazard Identification and Vulnerability Assessment (HIVA). 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 the community is susceptible to. According to FEMA, LMSs 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, 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 monetary 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. The Guiding Principles typically contain 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 Post-Disaster Redevelopment Plans (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 LMS Goals and Objectives will guide the priority of the mitigation initiatives.

The Hendry County LMS (adopted in 2005) was used as a source of information in developing this profile and was also reviewed for any enhancements that could be made to allow better integration with other plans, particularly the local Comprehensive Plans.

Hazard Identification and Vulnerability Assessment

This section of the LMS was reviewed for its ability to provide hazard data that can support comprehensive planning. The LMS uses detailed data on structures at risk for all of the major hazards discussed in this profile. It does not, however, discuss populations at risk, preferring to focus on financial risks to the built environment and top employers. Also, there is only a brief and inconclusive narrative regarding future development and land use issues. The maps in the LMS show only the hazard areas and do not attempt to correlate this with land uses. It does, however, map the hazards in relation to critical facilities and municipal boundaries. Incorporating land use 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. Hendry County's LMS could improve its usefulness to comprehensive planning by linking the extensive economic data provided in the risk analysis sections with existing and future land use.

Guiding Principles

The Existing Planning Mechanisms section of the Hendry LMS directly fits the above-described Guiding Principles section. The Hendry LMS lists policies from the Comprehensive Plan, CEMP, and local emergency ordinances that relate to hazard mitigation activities. Many of the cited policies appear to exceed the realm of mitigation, though. Also, hazard-related policies from each jurisdiction's Comprehensive Plan are included in the LMS for reference. This provides all jurisdictions and County departments access to this information which can be used to judge whether more integration is needed.

The LMS also has an excellent list of responsible players and their roles in mitigation and recovery activities. It is found in the Existing Planning Mechanisms section. The section includes both elected officials and county staff members as well as municipal players.

LMS Goals and Objectives

The LMS Goals and Objectives can be found in **Attachment D**. The following is a summary of how well the LMS has addressed mitigation issues that coincide with planning concerns.

Hendry County has a single overarching goal: to create a disaster resistant community where feasibly possible. The LMS also has several detailed objectives followed by policies formatted much like a comprehensive plan. Hendry's LMS goals and objectives are unique from other counties' LMSs because of the more detailed format and could be an example for others to improve their LMS framework. Its objectives address flooding, disaster response and recovery, lightning, hazardous materials, and the improvement of road networks needed for reduced regional evacuation times. No specific references are made to the Hendry County Comprehensive Plan or the Land Development Code, although there are some obvious opportunities for linkages. References to other plans where appropriate, could provide a clear foundation for integration of the LMS to occur in other plans. For instance, several of the issues mentioned could be incorporated into the Capital Improvements Element of the Comprehensive Plan to effectively reinforce the LMS emphasis of the issue. The objectives and policies of the LMS could be enhanced by adding more of them that touch on some of the highest risks to the County. The policies covering flooding and evacuation are great and detailed policies such as these could be added pertaining to wildfire mitigation as well.

Comprehensive Emergency Management Plan

The Mitigation Annex of the 2005 Hendry County CEMP was reviewed for consistency with the other plans and evaluated in its effectiveness as a tool for planners. The Annex describes the formation of a Mitigation Task Force which is empowered to set mitigation priorities. This body comes under the direction of the Hendry County Emergency Management Director, but it is comprised of a cross section of the county: elected officials, appointed county staff, representatives from both Clewiston and LaBelle, and private representatives of the Chamber of Commerce and utilities. From the CEMP, there appears to be a disconnect in that the EM Director is the head of the Task Force, yet the Planning Division is specifically called on to implement any hazard mitigation initiatives or projects. There could be more responsibility for mitigation assigned to those responsible for land use planning. There is no mention of a countywide Local Mitigation Strategy, nor any attempt to be consistent with that related document probable because the LMS did not exist when this annex was written. The Annex states that the Mitigation Task Force is required to revisit and update the goals, objectives, and projects of the CEMP annually. There are no specific structural or non-structural mitigation activities listed, however. There is mention of the intent to control hazardous materials exposure and riverfront flooding through improved zoning, building codes, and enforcement. Also, dependant upon funding, the County intends to retrofit and improve existing shelters according to the Annex. Overall, the Mitigation Annex of the CEMP needs to be updated to reflect the LMS as the primary source of mitigation information.

Post-Disaster Redevelopment Plan

A PDRP for Hendry County was not available for review at the time this profile was drafted. If Hendry County has a current PDRP, this will be obtained and reviewed for the final version of this document.

National Flood Insurance Program/Community Rating System

Hendry County, Clewiston, and LaBelle are all participating communities in the National Flood Insurance Program. In addition, Hendry County participates in the Community Rating System and has a current class of 8.

4. Comprehensive Plan Review

Hendry County's Comprehensive Plan (revised in 2005) was reviewed in order to see what the County has already done to integrate their LMS policies, and hazard mitigation in general, into their planning process. A list of the goals, objectives, and policies currently in the plan that contribute to hazard mitigation is found in **Attachment E**. The following is a summary of how well the plan addressed the four hazards of this analysis.

Flooding Hazards

Flooding was addressed in the Comprehensive Plan in multiple objectives and policies. There are several policies which limit densities in floodplains and wetlands, except where clustering on uplands is a viable option. Buffering is a priority between these environmental service providers and structures. Policies call for the preservation of natural drainage flows, the provision of stormwater management facilities, and the creation of a countywide master water management plan. The County also commits to advancing public awareness of other agency initiatives regarding surface water management.

Wildfire Hazards

There were no policies in the Comprehensive Plan that relate to wildfire hazards.

Sinkhole Hazards

No policies were found during this review that directly related to sinkhole hazards. There is mention of considering soil suitability and topography when developing a site. Such a basic description could be applied to the unstable soils where properties are susceptible to sinkholes.

Other Hazard Mitigation Policies

The protection and restoration of historic resources are mentioned. The Housing Element also highlights policies to fund housing rehabilitation and structural improvements, each of which supports mitigation-related retrofits or hardening. The Capital Improvements Element has a policy to prioritize projects with hazard elimination being the first criteria. Maintaining effective traffic circulation on the county road network is cited as a priority where it improves public safety and health, both of which could be related to hazards.

5. Recommendations

For the LMS to be effective in the decision-making process of growth management, its objectives and policies must be integrated into the Comprehensive Plan. The Plan is the legal basis for all local land use decisions made. If hazard mitigation is to be accomplished beyond the occasional drainage project, these hazards must be addressed in comprehensive planning, where development can be limited or regulated in high-risk hazard areas just as sensitive environments are routinely protected through growth management policies. Mitigation of hazards is considerably easier and less expensive if done when raw land is being converted into development. Retrofitting structure and public facilities after they have been built is significantly more expensive. However, if older neighborhoods or communities are scheduled to be revitalized or redeveloped, hazard mitigation needs to be an aspect considered and integrated into the project prior to the time of development approval.

Hendry County has begun this process of integrating hazard mitigation throughout its Plan's elements. The prior section summarized how the major hazards for the County have been for the most part well-addressed. There is, however, still some disconnection between the LMS objectives and initiatives, and the policies in the Comprehensive Plan. By tightening the connection between these documents, the County will find it easier to implement hazard mitigation, and there will be higher awareness of these issues within more departments of the County government. In the final version of this document, a table will be included that presents options for further integration, such as those listed in the **Executive Summary**, as well as the basis for these recommendations.

NOTE: The recommendations set out in this section are only suggestions. Through the workshop process and contact with the local governments, the goal of this project is to result in specific recommendations tailored and acceptable to each county. While the profile addresses hurricanes, flooding, wildfire, and sinkholes, the County should consider other hazards, if appropriate, such as tornadoes and soil subsidence, during the update of the local Comprehensive Plan.

6. Sources

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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 Potential Sinkhole Hazard Areas**

Attachment D

Hendry County Local Mitigation Strategy Goals and Objectives

GOAL: CREATE A DISASTER RESISTANT COMMUNITY WHERE FEASIBLY POSSIBLE.

Objective 1 Hendry County shall actively pursue the establishment and maintenance of a Countywide Master Surface Water Management Plan. The Plan will include appropriate scale maps of flood prone areas and areas subject to recurring flood damage, as well as policies, actions and recommendations designed to prevent or reduce potential flood damage to public or private property in Hendry County.

Policy 1.1: The County shall maintain a data base of flood prone areas, properties or structures which have received frequent flood damage, and critical facilities which have the potential to receive flood damage.

Policy 1.2: The County will undertake to address floodplain management issues through stronger building and zoning codes, inspections and enforcement. Revised building codes may include, but not be limited to, requirements for "break-away" lower floors, and/or properly anchored stilts, or adequate fill for residential structures built in or adjacent to floodplains. Revised zoning codes may include, but not be limited to, establishment of a "buy-out" policy for structures repeatedly and severely damaged by flooding, prohibition of new development in areas which are frequently flooded, buffer zones between new development and floodplains, and the use of appropriate setbacks to prevent floodplain encroachment.

Policy 1.3: Hendry County, in conjunction with the South Florida Water Management District and the Florida Department of Environmental Protection, shall establish drainage and flood prevention Best Management Practices (BMPs) for new development. The County shall develop an incentives program, designed to encourage new development to adhere to BMP guidelines.

Objective 2: Hendry County shall improve its ability to manage both small and large-scale disaster response and recovery events.

Policy 2.1: Hendry County shall require the protection of natural resources (such as environmentally sensitive lands) in order to maximize their mitigative benefits and to safeguard them from damage caused by natural disasters.

Policy 2.2: Hendry County shall actively pursue funding for the purpose of retrofitting public, and suitable private buildings, to enable these structures to meet State public shelter criteria for wind speed. At such time as funding has been secured, the County shall initiate retrofitting.

Policy 2.3: Hendry County shall actively seek funding, and shall initiate the placement of emergency electrical generators in designated public shelters and critical public facilities.

Policy 2.4: The Hendry County SHIP Program, or other local housing agency, shall establish, either through mutual aid agreement with another local

government, or through establishment of a contract with an emergency housing provider, a source for emergency/temporary housing units, to be utilized in Hendry County, during recovery following a large-scale disaster.

Policy 2.5: The Hendry County Building Department shall establish a program to identify and inventory: suitable sites for emergency staging, storage and distribution; buildings suitable for use as disaster field offices; and, buildings suitable for use as disaster recovery centers.

Policy 2.6: Hendry County shall examine and, where feasible, implement methods to address the County's shortage of trained personnel for essential post-disaster functions. Methods to be examined can include, but may not be limited to, training volunteers, drawing personnel from non-impacted counties, and creating partnerships with private sector entities for temporary use of their personnel.

Objective 3: Hendry County has one of the highest rates of lightning strikes, per thunderstorm, in the Nation. The County shall cooperate with electric utility companies to develop and implement methods to reduce the potential for lightning-caused electrical damage.

Policy 3.1: Hendry County Zoning and Code Enforcement agencies shall examine the feasibility of establishing incentives to encourage builders and developers to install lightning rods, surge protectors and/or other protective devices in all new residential or commercial construction.

Policy 3.2: Hendry County shall encourage local electric utilities to implement increased public awareness of lightning and power surge hazards.

Objective 4: Hendry County shall, where feasible, implement strategies and procedures to increase its ability to respond to, and contain, hazardous materials incidents.

Policy 4.1: Hendry County's volunteer fire departments, shall implement, where feasible, an integrated hazardous materials/hazardous wastes response training program for all County and/or fire department personnel who may be involved in hazardous materials clean up and disposal activities. Wherever possible, the County shall identify and actively seek funding sources for this purpose.

Policy 4.2: Hendry County's volunteer fire departments, shall implement, where feasible, a program to procure the proper equipment and clean up materials to enable improved response to hazardous materials incidents. Wherever possible, the County shall identify and actively seek funding sources for this purpose.

Policy 4.3: The County Government shall develop a "Best Management Practices" checklist, for incorporation into local zoning, building and site planning procedures, regarding the proper use, storage and disposal of hazardous substances.

Objective 5: Hendry County shall actively seek means to improve and expand the County road network for the purpose of improving Countywide evacuation times (particularly pass-through evacuations from other counties), reducing the overall number of automobile accidents on local roads, reducing the likelihood of

hazardous materials incidents involving transportation accidents, and generally providing for a safer, healthier community.

Policy 5.1: Countywide road improvement efforts shall initially concentrate on State Road 80, U.S. 27, State Road 29, and County Road 78, as well as main roadways connecting to these facilities. In this effort, the County shall investigate the possibility of combining its efforts with the Cities of LaBelle and Clewiston, other neighboring jurisdictions, and the Florida Department of Transportation.

Policy 5.2: Secondary road improvement efforts shall be directed toward local roadways most heavily utilized by major users and transporters of hazardous materials, roadways likely to support the bulk of emergency evacuation and shelter traffic, and roadways with a high accident occurrence rate.

Attachment E

Hendry County Comprehensive Plan Excerpts Related to Hazard Mitigation

Economic Development Element

OBJECTIVE 1.1: Hendry County will promote the conservation and enhancement of natural, cultural, and social resources that represent the County's agriculture, retirement, recreation, and tourist-oriented economy.

Policy 1.1.3: Hendry County will encourage the preservation of sensitive natural resources, including wetlands, estuaries, clean air and water, historic resources, scenic vistas, and other unique natural resources.

Future Land Use Element

GOAL: To ensure the development and maintenance of a functional and well related pattern of land use types that provides for population growth, land development and redevelopment, and the appropriate distribution, location, densities and intensities of use consistent with adequate services and facilities and consideration of natural resources.

Policy 2.1.1a: **AGRICULTURE/CONSERVATION:** The areas designated on the Future Land Use Map as Agriculture/Conservation include generally rural areas with a large proportion of wetlands. Permitted uses and densities/intensities shall be the same as for Agriculture (Policy 2.1.1) except:

EXHIBIT A

II. FUTURE LAND USE ELEMENT

Adopted: March 5, 1991 II-14

Amended: November 9, 1999

Revised: 2005

- (a) No industrial development (including agriculture related) shall be permitted within a wetland;
- (b) Non-residential development shall be limited to ensure that wetlands are preserved and that activities which impair the natural function of the wetland are prohibited; and
- (c) Residential development within wetland areas shall not exceed one unit per 20 acres. This density may be clustered and may be blended with the density in the agriculture district provided the maximum density does not exceed the combined densities of the properties under their base district.

All other activities shall be discouraged away from wetlands so that incompatible land uses are minimized. Where incompatible land uses are allowed to occur, mitigation shall be considered as a means to compensate for the loss of wetlands (Rule 9J-5.013(3)(b), FACILITY). All activities in wetlands within this district shall comply with state and federal laws and rules regulating wetland development, specifically: FDEP regulations pursuant to Chapters 373 and 403, Florida Statutes, and U.S. Army Corps of Engineers regulations pursuant to Section 404 of the Clean Water Act, as amended. Publicly owned parks and other

recreation facilities are permitted in all residential and agricultural land use categories, except where prohibited or restricted by the Land Development Code. Nothing in this policy shall prevent a landowner from establishing that a given parcel in this category, or part thereof, is not a wetland under the definition set forth in the Conservation Element Policy 7.1.1. Such parcels or parts thereof which are determined not to be wetlands shall be subject to agricultural category restrictions as set forth in Policy 2.1.1, above.

Policy 2.2.7: The Land Development Regulations adopted September 1, 1991, requires that applications for Planned Unit Developments (PUD's) show the location of all wetlands within the area of the proposed development. No final permit for a Planned Unit Development shall be issued which will allow an activity to interfere with the function of any wetland or other environmentally sensitive land.

Policy 2.3.1: Hendry County shall allow schools in all land use categories, except Industrial, consistent with the following criteria.

- g)a) Schools shall be located in a coordinated manner ensuring that the planning, construction, and opening of educational facilities are coordinated in time and location, concurrent with both need and necessary services and infrastructure, and to ensure compatibility with the Comprehensive Plan;
- h)b) The proposed location is compatible with present and projected uses of adjacent property.

EXHIBIT A

II. FUTURE LAND USE ELEMENT

Adopted: March 5, 1991 II-33

Amended: November 9, 1999

Revised: 2005

- i)c) The proposed location is well drained and soils are suitable for development or are adaptable for development and outdoor educational purposes with drainage improvements;.
- j)The proposed location is not within a velocity flood zone or floodway;.
- k)Proposed school sites should be located away from industrial uses, railroads, airports, and similar land uses to avoid noise, odor, dust, and traffic impacts and hazards;.
- l)Disrupting influences caused by school yard noises and traffic shall be buffered to ensure sufficient distances from hospitals, adult communities, and nursing homes;.
- m)In the planning, siting, land acquisition and development of the facility, evaluation shall include consideration of the student population density of the area (such as sufficient student population of the existing rural communities), and public safety;.
- n)There are no significant environmental constraints that would preclude development of a public educational facility on the site; and.
- o)Hendry County shall advise the School Board of all Plan amendments that may affect the location of new schools and proposed improvements.

OBJECTIVE 2.4 **HISTORIC AND NATURAL FEATURES, FACILITIES AND SERVICES:**
Hendry County shall continue the coordination of future land uses with the appropriate underlying historic and natural resources, soils and

topography, and the availability of facilities and services and land for utilities. The general criteria and standards for the natural features are specified in the Goals, Objectives, and Policies of the Conservation Element. Furthermore, Hendry County shall require the protection of historically significant structures within the unincorporated area of the County as identified by the State of Florida or the National Register of Historic Places.

Policy 2.4.3:

With the Land Development Regulations adopted September 1, 1991, establish within zones or districts, adhering to the Future Land Use Map, criteria and standards specific enough to implement this Plan and regulate the future development of land in accordance with the provisions of this Plan, so that:

- a) historic and natural resources are protected by the adoption of such provisions as, but not limited to, identification of the actual location of such resources through references to official maps contained in this Plan, requirements for designing development projects to manage these resources, provisions for conservation easements and similar methods for permanently protecting these resources, and provisions for protection of resources through PUD or cluster development review techniques;
- b) soils and topography are suitable, by the adoption of such provisions as, but not limited to, special requirements for construction and other development activities on slopes or soils which are excessively wet or unable to support large structures; and
- c) facilities and services are available sufficiently to support proposed development, as indicated in this and the other elements of this Plan, and specifically as provided in the Concurrency Management System established pursuant to Policy 9.2.2 of the Capital Improvements Element. The owner/developer of any site shall be responsible for the onsite management of stormwater runoff at the time of development or redevelopment in a manner so that post development runoff rates are the same as pre-development conditions. The number of zones may be more numerous than those specified in Objective 2.1, and the criteria and standards may be more restrictive and/or specific, as long as they are consistent with the provisions of this Comprehensive Plan.

Policy 2.4.4:

All proposed subdivisions shall be developed in adherence with this Plan, with criteria and standards specific enough to implement this Plan and regulate the future subdivisions and platting of land in accordance with the provisions of this Plan, so that the protection of historic and natural resources, the suitability of soils and topography and the availability of facilities and services are required.

Policy 2.4.10:

In addition to density restrictions in other parts of the Comprehensive Plan, density and intensities of use in the 100-year FEMA floodplains shall be restricted to the extent necessary to preserve the flood storage capacity and other hydrological functions of the floodplain, and to protect important biological and ecological functions of a floodplain. For floodplains which drain directly into waters designated as "Outstanding

Florida Waters”, residential densities which exceed one unit per five acres are presumed to impair the hydrological, biological, and ecological functions of the floodplain. Except within five miles from the existing city boundaries of LaBelle and Clewiston, for floodplains which drain into other water bodies of the state, residential densities which exceed one unit per acre are presumed to impair the hydrological, biological, and ecological function of a floodplain.

A landowner may overcome the presumptions created in this policy by competent and substantial scientific or engineering evidence showing that a specific use will not impair the hydrological and important biological and ecological functions of the affected floodplain, provided that the densities and intensities of use as shown on the Future Land Use Map shall not be exceeded.

Policy 2.5.3:

Criteria, standards, and related provisions established in the Land Development Regulations for reducing the impacts from any land uses that are not in conformance or are inconsistent with this Comprehensive Plan shall as a minimum:

- a) Regulate the subdivision and platting of land.
- b) Regulate the use, intensity and location of land development in a manner that is compatible with adjacent land uses and provides delineation in the Conservation Element.
- c) Protect Conservation Use lands designated on the Future Land Use Map and those delineated in the Conservation Element.
- d) Regulate areas subject to seasonal and periodic flooding by requiring adequate drainage and stormwater.
- e) Ensure safe and convenient on-site traffic flow and vehicle parking needs through the Site Plan review process and offstreet parking regulations.
- f) Ensure that public facility, utility and service authorization has been procured prior to issuing any development order and that construction of said facilities, utilities, and services is concurrent with development.
- g) Provide that development orders and permits shall not be issued which result in a reduction of the level of services for affected public (community) facilities.

Policy 2.7.1:

WETLANDS: Wetlands are areas identified by plant communities commonly associated with lands inundated by water for a significant period each year. Those communities are shown on the Future Land Use Map Series map titled Priority Wetlands for Listed Species and Land Cover. The maps provide general location for various swamps, marshes, and wet prairies. This policy is intended to protect and conserve wetlands and shall include restrictions on the density of development within wetlands to one unit per 20 acres, and shall require all uses in wetlands to meet applicable state and Federal regulations and permitting requirements.

The County shall support the Everglades SWIM Plan as implemented by the Water Management District. Such support shall consist of, but not be limited to, review of the SWIM Plan to determine which portions should be incorporated into the County's Comprehensive Plan, distribution of information on the SWIM Plan to landowners, developers, and staff who

are affected by its provisions, and provision of available information to the District to assist the District in its own implementation efforts.

Hendry County shall discourage incompatible uses within wetlands. Permissible uses shall include single family and two-family residential dwellings. All other uses will be directed away from wetlands. Where incompatible uses are allowed to exist, mitigation shall be provided to compensate for loss of wetlands. Permits will be issued by any agency of Hendry County that provides evidence that the requirements of Chapters 373 and 403, Florida Statutes, Section 404 of the (Federal) Clean Water Act, and Section 10 of the (Federal) River and Harbours Act are met. Unless necessary permits have already been obtained under the foregoing laws, any permit issued by the County shall be contingent upon the issuance of state and federal permits.

Policy 2.7.5: **CALOOSAHATCHEE RIVER:** The Caloosahatchee River is shown on all of the Future Land Use Map Series. The Caloosahatchee River (also designated canal number C-43) is rated a Class III river according to the surface water quality classification system of the FDEP. This classification represents benefits from the river for recreation, fish, and wildlife, and is a middle range classification in the FDEP system which runs from Class I (potable water) to Class V (industrial). The Caloosahatchee River is under the management of the South Florida Water Management District (SFWMD). The County shall adopt land use regulations to protect the ambiance and environmental integrity of the Caloosahatchee River within one year of the adoption of this amendment dated .

Policy 2.7.7: **FLOODPLAINS:** The floodplains established by the Federal Emergency Management Agency (FEMA) as the 100-year floodplain on the Federal Insurance Rating Maps (FIRM) for the national flood insurance program covers a very large area of Hendry County. These areas are shown on “Map 2: FEMA Flood Prone Areas” map of the Future Land Use Map Series. The County has adopted the FEMA-required flood hazard regulations, and shall continue to maintain these regulations. No building permit, except for a single family or two-family residential unit, or land use or development permit will be issued by any agency of Hendry County until the applicant provides evidence that the requirements of the National Flood Insurance Act of 1973, as amended, have been or will be complied with by the applicant. Density and intensity of development shall be based on the land use category within which the property is located. If the floodplain area is a wetland, use, density, and intensity shall be as established for the agriculture/conservation category. The following general development standards shall apply within a defined 100-year floodplain:

- a) Development involving the storage, use, transfer, generation, or disposal of hazardous materials or waste shall be prohibited or shall conform to the guidelines in Future Land Use Policy 2.4.9.

Policy 2.7.8: Development is to be clustered or located on upland areas if available on parcels which contain wetlands, and all development shall avoid the creation of lots which do not include buildable upland areas, if upland areas are available.

Housing Element

- Policy 4.2.2:** As a guide for the maintenance of significant historic resources, the County will reference the *Secretary of Interior's Standards for Rehabilitation and Guidelines for Rehabilitation and Guidelines for Rehabilitating Historic Buildings*.
- Policy 4.2.3:** Hendry County, in cooperation with the Hendry County Area Housing Commission, shall continue to research State, Federal, private foundation grant and low-interest loan, and other programs available for funding housing rehabilitation, structural and aesthetic improvements, and demolition.
- Policy 4.2.4:** Hendry County will continue to prepare and submit housing assistance applications, as available, for the purposes of housing rehabilitation, structural and aesthetic improvements, and demolition.
- Policy 4.4.1:** By December 2000, conduct research or surveys to inventory the historically significant housing in Hendry County. The activities may include further inquiries to the Florida Master File, the National Society for Historical Preservation, the National Register of Historic Places, local historic societies, interviews with long term citizens, and other techniques. This survey may include other historic structures or sites.
- Policy 4.4.2:** Historically significant housing shall be afforded protection status by the Land Development Regulations in order to allow reasonable maintenance improvements, and specific criteria and standards for such status shall be included in the Land Development Regulations.
- Policy 4.4.3:** Hendry County shall request the assistance of the State of Florida to identify significant historic resources within the unincorporated areas which are in need of protection and develop management and restoration plans as appropriate.
- Policy 4.4.4:** Historically significant properties shall be protected through designation as historic sites by the State or County.

Recreation and Open Space Element

- OBJECTIVE 5.6:** **OPEN SPACE OR NATURAL RESERVATIONS.** Hendry County presently does not have publicly accessible reserved areas for open space or natural features, as well as, access to freshwater beaches and shores. The desire is that such areas be available for the residents and visitors of Hendry County. This shall be accomplished by undertaking the activities described in the policies below.
- Policy 5.6.1:** By the end of 2010, finalize sites suitable for open space or natural reservations.
- Policy 5.6.2:** By the end of 2010, coordinate with the South Florida Water Management District concerning land owned by the District that could be made available as open space or natural reservation. Coordination may include, but is not limited to, review of SFWMD land holdings to determine which are potentially appropriate for open space preservation.

Environmental Services Element

Policy 6.B.1.6: The County shall cooperate with the South Florida Water Management District by providing locations for display of water conservation exhibits and for distribution of water conservation literature in public buildings.

GOAL 6.D: To assure the control of current and future impacts to natural drainage patterns which may increase uncontrolled storm water run-off to unacceptable levels, and to maintain water quality standards.

OBJECTIVE 6.D.2: The natural drainage patterns of Hendry County have been considerably disrupted over the years, so that certain areas of residential development do experience some problem with retained water after storms. The desire is to reduce this deficiency by continued coordinating activities with the SFWMD.

Policy 6.D.2.1: The County shall coordinate with the South Florida Water Management District in correction of problems created by the major state and federal drainage projects in the past. The District has programmed correction of some of the problems.

Policy 6.D.2.2: Include drainage correction design in the design of any roadway improvements undertaken in the future. Design of new roads or major road improvements shall eliminate flooding conditions which specifically result from past road construction, or which can be relieved by new construction.

Policy 6.D.2.3: The County shall coordinate with the SFWMD and the U.S. Army Corp of Engineers in the Restudy of the Caloosahatchee River to ensure that the natural drainage patterns are not disrupted more than necessary.

OBJECTIVE 6.D.3: Coordinate the extension of increase of capacity of drainage. This shall be accomplished by carrying out the following activities.

Policy 6.D.3.1: As referenced in Policy 6.D.2.2 above, the County shall coordinate the completion of drainage improvements with future road projects where the two projects are tied together geographically. Design of new roads or major road improvements shall eliminate flooding conditions which specifically result from past road construction, or which can be relieved by new construction.

Policy 6.D.4.1: By the end of 2002, develop a County-wide master drainage and water management plan, to coordinate the different drainage basins and to coordinate the activities and standard of the local water management districts. Where individual basins are functionally related, plans for these basins shall be coordinated.

Policy 6.D.4.2: Continue a maintenance schedule for the drainage works in the County as preventative measures to maximize use of the existing drainage.

Policy 6.D.4.3: The County shall continue to monitor stormwater drainage patterns to ensure that urban development will be designed to maintain pre-development flow characteristics and that local flooding conditions be corrected. Where drainage is to a natural drainage feature (such as a lake, stream or wetland), regulations shall provide for retention/detention as necessary to improve water quality and flow. These standards shall be based on applicable SFWMD standards. These regulations shall

include provisions to ensure that natural drainage features are not modified or destroyed, except that modifications which do not adversely affect overall drainage functions may be permitted when necessary for the stormwater management system to meet the level of service standards in this Plan. Buffers will be created between development and environmentally sensitive areas, including wetlands and other surface waters. The purpose of the buffer is to protect natural resources from the activities and impacts of development. The buffers shall function to:

- a) Provide protection to the natural resources from intrusive activities and impacts of development such as trespass, pets, visual impacts, vehicles, noise, lights, and stormwater. The negative impacts of the uses upon each other must be minimized or, preferably, eliminated by the buffer such that the long-term existence and viability of the natural resources, including wildlife populations, are not threatened by such impacts and activities. In other words, incompatibility between the uses is eliminated or minimized and the uses may be considered compatible (which means a condition in which land uses or conditions can co-exist in relative proximity to each other in a stable fashion over time such that no use or condition is unduly negatively impacted directly or indirectly by another use or condition).
- b) Types of buffers: The buffer may be a landscaped natural barrier, a natural barrier, or a landscaped or natural barrier supplemented with fencing or other man-made barriers, so long as the function of the buffer and the intent of this policy is fulfilled.

Conservation Element

GOAL: To conserve and enhance the quality of the natural resources in Hendry County for present and future population.

Policy 7.1.1: **WETLANDS:** Wetlands are areas identified by plant communities commonly associated with lands inundated by water for a significant period each year. Those communities are shown on the Future Land Use Map Series maps titled Priority Wetlands and Land Cover. These maps provide general location for various swamps, marshes, and wet prairies. This policy is intended to protect and conserve wetlands and shall include restrictions on the density of development within wetlands to one unit per 20 acres, and shall require all uses in wetlands to meet applicable state and Federal regulations and permitting requirements.

The County shall support the Everglades SWIM Plan as implemented by the Water Management District. Such support shall consist of, but not be limited to, review of the SWIM Plan to determine which portions should be incorporated into the County’s Comprehensive Plan, distribution of information on the SWIM Plan to landowners, developers, and staff who are affected by its provisions, and provision of available information to the District to assist the District in its own implementation efforts.

Hendry County shall discourage incompatible uses within wetlands. Permissible uses shall include single family and two-family residential dwellings. All other uses will be directed away from wetlands. Where

incompatible uses are allowed to exist, mitigation shall be provided to compensate for loss of wetlands. Permits will be issued by any agency of Hendry County that provides evidence that the requirements of Chapters 373 and 403, Florida Statutes, Section 404 of the (Federal) Clean Water Act, and Section 10 of the (Federal) River and Harbours Act are met. Unless necessary permits have already been obtained under the foregoing laws, any permit issued by the County shall be contingent upon the issuance of state and federal permits.

Policy 7.1.3: **HISTORIC RESOURCES:** There are various Indian mounds, historic fort locations, and the Hendry County Courthouse listed in the Florida Master File of historic and archaeological places. The Indian mounds have not been located on local maps, and to avoid exposure to possible looting and vandalism, these are intentionally omitted from the Future Land Use Map Series. The historic fort locations are located on Map 2: FEMA Flood Prone Areas map, as is the Hendry County Courthouse.

Any development proposal which encompasses a historic and/or archaeological site which is listed on the Florida Master File or on the Map 2: FEMA Flood Prone Areas map shall be reviewed by Hendry County staff for historic significance.

Policy 7.1.4: **SOILS AND TOPOGRAPHY:** Soils classifications are included on the map titled Map 3: Land Surface Elevations. Extensive development potential rating of soils in Hendry County is not yet available. The only current rating system pertains to septic tank suitability, and has served as a guide for the location of land use categories and densities.

Policy 7.1.8: **FLOODPLAINS:** The floodplains established by the Federal Emergency Management Agency (FEMA) as the 100-year floodplain on the Federal Insurance Rating Maps (FIRM) for the national flood insurance program covers a very large area of Hendry County. These areas are shown on Map 2: FEMA Flood Prone Areas map of the Future Land Use Map Series. The County has adopted the FEMA-required flood hazard regulations, and shall continue to maintain these regulations.

No building permit, except for a single family or two family residential unit, or land use or development permit will be issued by any agency of Hendry County until the applicant provides evidence that the requirements of the National Flood Insurance Act of 1973, as amended, have been or will be complied with by the applicant.

Density and intensity of development shall be based on the land use category within which the property is located. If the floodplain area is a wetland, use, density, and intensity shall be as established for the agriculture/ conservation category.

The following general development standards shall apply within a defined 100-year floodplain:

- a) Development involving the storage, use, transfer, generation, or disposal of hazardous materials or waste shall be prohibited or shall conform to the guidelines in Future Land Use Policy 2.4.9.

Policy 7.2.3: The land development regulations adopted by the County shall continue to state that no building permit, except for a single family or two family residential unit, or development permit will be issued by any agency of Hendry County until the applicant provides evidence that the requirements of state and federal law as set forth in Policies 1.1, 1.8, 2.1, and 2.2 have been or will be complied with by the applicant and that the natural functions of designated or otherwise known environmentally sensitive lands will not be adversely affected by the use for which the application is sought. Wetlands, aquifer recharge areas, native vegetation communities, wildlife habitat, and potable water well cones of influence shall be regulated in accordance with the applicable Comprehensive Plan policies for these resources.

OBJECTIVE 7.6: The County shall seek to conserve, appropriately use, and protect the quality and quantity of current and projected water sources that flow into estuarine or oceanic waters, by implementing the program of activities described in the following policies:

Capital Improvements Element

Policy 9.5.1: The County shall continue to prioritize each type of facility under its fiscal responsibility as follows:

- a) Projects which eliminate hazards or to protect the public safety and health.
- b) Projects needed eliminate existing deficiencies.
- c) Projects which are rational extensions of existing facilities.
- d) Projects which promote infill development in existing development areas where other facilities are available.
- e) Projects which accommodate redevelopment.
- f) Projects for which outside sources of funding are available.
- g) Projects which otherwise have lower budget impact.
- h) Projects which include or further other projects of other entities, such as State agencies, the South Florida Water Management District, the Big Cypress Seminole Reservation, and the Cities of Clewiston and LaBelle.

OBJECTIVE 9.6: Chapter 9J-5 requires that an Objective be included in a comprehensive plan for the limitation of public facilities that subsidize development in high-hazard coastal areas. Hendry County is not a coastal county and does not have such areas, so this requirement does not apply.