

VOLUSIA COUNTY

The 2004 hurricane season underscores the importance of better integrating hazard mitigation activities and local comprehensive planning. This past fall, Floridians experienced significant damage from Hurricanes Charley, Frances, Jeanne, and Ivan. In 1992, Hurricane Andrew devastated South Florida. In 1998 and 1999, most counties in Florida experienced wildfires, in some cases, the fires created devastating results – the loss of homes. 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. It is imperative to try to reduce the costs of natural disasters. One way is to better integrate hazard mitigation considerations into local comprehensive planning.

- Contents:**
1. County Overview
 2. Hazard Vulnerability
 3. Existing Mitigation Measures
 4. Comprehensive Plan Review
 5. Recommendations
 6. Municipal Case Study: New Smyrna Beach
 7. Sources

1. County Overview

Geography and the Environment

Volusia County is located along the northeastern coast of Florida. It covers a total of 1,103 square miles with an average population density of 401.9 people per square mile (U.S. Census, 2000).

There are seventeen incorporated municipalities within the County, and they are listed in **Table 1.1**.

Population and Demographics

Official 2004 population estimates for all jurisdictions within Volusia County, as well as, the percent change from the 2000 U.S. Census are presented in **Table 1.1**. The most current estimated countywide population of Volusia is 484,261 people (University of Florida, Bureau of Economic and Business Research, 2004). A total of 23.5% of the population lives in the unincorporated County, while the largest city is Deltona. Between 1990 and 2000, Volusia County experienced a growth rate of 19.6%, which is somewhat lower than the statewide growth rate of 23.5% during those 10 years.



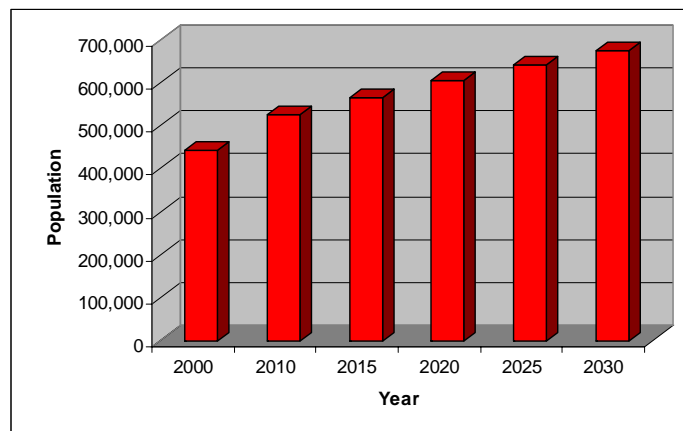
Table 1.1 Population by Jurisdiction

Jurisdiction	Population, Census 2000	Population Estimate, 2004	% Change, 2000-2004
Unincorporated	106,880	113,678	6.4%
Daytona Beach	64,112	65,077	1.5%
Daytona Beach Shores	4,299	4,568	6.3%
DeBary	15,559	17,856	14.8%
DeLand	20,904	23,829	14.0%
Deltona	69,543	80,052	15.1%
Edgewater	18,668	20,637	10.5%
Flagler Beach (part)	76	76	0.0%
Holly Hill	12,119	12,612	4.1%
Lake Helen	2,743	2,834	3.3%
New Smyrna Beach	20,048	21,334	6.4%
Oak Hill	1,378	1,841	33.6%
Orange City	6,604	7,900	19.6%
Ormond Beach	36,301	39,009	7.5%
Pierson	2,596	2,636	1.5%
Ponce Inlet	2,513	3,160	25.7%
Port Orange	45,823	53,217	16.1%
South Daytona	13,177	13,945	5.8%
Countywide Total	443,343	484,261	9.2%

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

According to the University of Florida, Bureau of Economic and Business Research (2004), Volusia County’s population is projected to continue to grow, reaching 674,500 people by the year 2030. **Figure 1.1** illustrates medium population projections for Volusia County based on 2004 calculations.

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



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

Of particular concern within Volusia 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, 22.1% of Volusia County residents are listed as 65 years old or over, 22.1% are listed as having a disability, 11.6% are listed as below poverty, and 10.8% live in a home with a primary language other than English.

2. Hazard Vulnerability

Hazards Identification

The Volusia Local Hazard Mitigation Plan has identified and prioritized hazards countywide and by individual jurisdiction. Being a large county in terms of land area, 832,000 acres of land and 238 square miles of water, there is diversity among its communities as to what are the most important hazards. Many municipalities are situated along the Atlantic Ocean, so storm surge is a specific hazard of concern. However, for inland communities like DeBary, Deltona, and Pierson, storm surge is not an issue. In addition to a countywide section, the plan contains a Jurisdictional Hazard Mitigation Plan for each municipality. This Profile contains a municipal case study for New Smyrna Beach, and as part of the LMS/Comp Plan assessment, the City's Jurisdictional Hazard Mitigation Plan and its Comprehensive Plan will be assessed.

Based on its Local Mitigation Plan, countywide the three top hazards are high wind, flooding, and wildfire. Sinkholes were identified as a low risk hazard, except for a small area where Routes 40 and 17 intersect.

High winds are the top hazard in Volusia County. Included in high winds are tornadoes. In May 1994, tornadoes caused \$6.7 million of damage to private property. Tornadoes and other El Nino-related wind events since 1997 have caused more than \$21 million in individual damage to residents and business, with 165 residences destroyed, 344 receiving major damage, and 413 receiving minor damage. Wind damage also can be caused by hurricane-spawned tornadoes. Tropical Storm Gordon in November 1994 caused over \$3.4 million in public damage and over \$9.3 million in private property damage. Damage from Hurricane Erin occurred in 1995, and evacuation and activation costs were incurred due to Hurricane Floyd in 1999.

The second highest ranked hazard is flooding. The County has more than 48 miles of ocean beaches, 39,488 acres of coastal marshland, and 135,808 acres of inland swamps. These low lying areas are highly susceptible to flooding and in many instances have flooded repeatedly. There are 26 repetitively flooded properties in the unincorporated County. All jurisdictions are a part of the National Flood Insurance Program, with the exception of Pierson and Lake Helen.

The third most significant hazard is wildfire. In 1998, 137,000 acres burned, attributable in large part to drought conditions and lightning. There were additional fires in 2000 and periodic brush fires since. Nearly the whole County is at medium or high risk with the exception of the coastline. The County also has a considerable amount of undeveloped areas with prime fuel sources for fires.

Hazards Analysis

The following analysis looks at four major hazard types: hurricanes and tropical storms (specifically surge), flooding, sinkholes, and wildfire. Most of the information in this section was obtained through the online Mapping for Emergency Management, Parallel Hazard Information System (MEMPHIS) provided by the Florida Department of Community Affairs (FDCA), Division of Emergency Management.

Existing Population at Risk

Table 2.1 presents the 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 Volusia County that live within Federal Emergency Management Agency Flood Insurance Rate Map zones, which signify special flood hazard areas. According to these maps, 15.4% of the population, or 68,361 people, are within the 100-year flood zone. Two-thirds of those at risk of flooding are either elderly and/or disabled. In Volusia County, sinkholes are a major risk. According to the MEMPHIS database, over half the population lives within a high- or medium-risk

sinkhole zone. There are 10,710 people living within a low-risk sinkhole zone, as reported in the second column of the table. Wildfire is a hazard of major concern to the County, and more people are at risk to wildfire compared to the other high-risk hazard estimates. Column 3 of the tables shows the amount of people that fall in medium- to high-risk wildfire zones, which is based on many factors, including vegetation and ease of access to the homes. A total of 242,291 people countywide, or 54.6% of the total population, are at medium- to extreme-risk from wildfire. Twenty-one percent of those at risk are disabled, making a quick evacuation difficult. The last column in **Table 2.1** represents those people in the County at risk from hurricane-related surge. The percentage of the countywide population that would be at risk from surge due to a Category 3 hurricane. Of the 54,233 potentially in the path of surge, up to 78% of them could be either elderly or disabled. All of the residents at risk from surge would have to evacuate or go to a County shelter.

Table 2.1 Countywide and Special Needs Populations at Risk from Hazards

Population	Flood	Sinkhole (low risk)	Wildfire (med-extreme risk)	Surge
Minority	6,466	30,390	37,258	4175
Over 65	17,571	51,654	51,337	17466
Disabled	28,017	97,680	93,419	24,838
Poverty	7,547	24,474	28,624	5873
Language-Isolated	0	0	0	0
Single Parent	3,591	14,075	14,713	3,015
Countywide Total	68,361	237,418	242,291	54,233

Source: Florida Department of Community Affairs, 2005a.

Evacuation and Shelters

As discussed in the previous sections, population growth in Volusia County has been steady, and this trend is projected to continue. A total of 12.2% of the County’s population is at risk from hurricane-related surge and therefore must be evacuated or sheltered. 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 Volusia are estimated to be 8 hours for Category 1 and 2 hurricanes, 10 hours for Category 3 hurricanes, and 11 hours for Category 4 and 5 hurricanes (FDCA, 2005b). The Florida Division of Emergency Management recommends that all counties achieve 12 hours or less clearance time for a Category 3 hurricane. This is due to the limited amount of time between when the National Hurricane Center issues a hurricane warning and when the tropical storm-force winds make landfall. Volusia County has met this standard for now, but with continued growth, it may be hard to maintain 12 hours or less clearance time in the future.

Coupled with evacuation is the need to provide shelters. If adequate space can be provided in safe shelters for Volusia’s residents, then this could be a solution to the ever-increasing clearance times for evacuation. Currently, there is space for 8,826 people in the County’s shelters, but there are 21,368 people more than that in need of shelter facilities in the case of a Category 5 hurricane. The County cannot supply enough space currently, and this deficit is expected to increase in the next 4 years to 24,061 people (FDCA, 2004). This is the largest deficit of shelter space in the Central Florida region.

Another option for Volusia County to consider in meeting future evacuation clearance time recommendations and shelter capacities is to encourage the construction of safe rooms in new houses that are built outside of flood zones. Residents who are further inland in the County and

not at risk for floods could shelter in place if they had a safe room that could withstand hurricane-force winds. This would free up more space in the shelters and on the roads.

Existing Built Environment

While the concern for human life is always highest 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 2.2** presents estimates of the number of buildings in Volusia County by structure type that are at risk from each of the four hazards being analyzed. A significant number of structures are situated in areas having a medium to high potential risk for wildfire. Many of the residential structures are single- and multi-family homes, 65,137 and 13,641, respectively; however, there are nearly 10,000 mobile homes also at risk. As people continue to move to Volusia County, less and less land along the coast is available for development; therefore, growth is pushed west into areas much more susceptible to wildfire. It is important to reduce fire risk; otherwise, another situation such as the one that occurred in 1998 is a very real possibility. Unlike out West, in Florida vegetation grows quickly, therefore areas that have a low wildfire risk today can become a high risk tomorrow.

Flooding is the second largest risk to property in the County, with nearly 100,000 structures situated within a flood zone. According to MEMPHIS data, 32,518 are single-family homes, 29,873 are mobile homes, and 21,822 multi-family homes. According to the latest National Flood Insurance Program Repetitive Loss Properties list, there are 26 repetitively flooded homes in unincorporated Volusia County that have had flood damage multiple times and received insurance payments (FDCA, 2005).

Table 2.2 also shows 98,586 structures within low or medium sinkhole risk areas, with almost half of those being single-family homes. A total of 51.3% of the structures at risk from surge are single-family homes and 33.8% are multi-family homes. Typically, structures at risk from surge are high-value real estate due to their proximity to the ocean.

Table 2.2 Countywide Number of Structures at Risk from Hazards

Structure Type	Flood	Sinkhole (med-adjacent risk)	Wildfire (med-high risk)	Surge
Single-Family Homes	32,518	72,278	65,137	18,696
Mobile Homes	29,873	3,980	9,273	2,050
Multi-Family Homes	21,822	11,921	13,641	12,304
Commercial	5,744	5,193	5,457	2,539
Agriculture	6,119	2,158	4,912	200
Gov./Institutional	2,101	3,056	2,769	652
Total	98,177	98,586	101,189	36,441

Source: Florida Department of Community Affairs, 2005a.

Analysis of Current and Future Vulnerability

The previous hazards analysis section discussed population and existing structures at risk from flooding, sinkholes, wildfire, and surge according to MEMPHIS estimates. This section is used to demonstrate the County’s vulnerabilities to these hazards spatially and in relation to existing and future land uses. The FDCA has provided maps of existing land use within hazard areas based on the 2004 County Property Appraiser geographic information system (GIS) shapefiles. Maps of future land uses in hazard areas were developed using the Volusia County future land use map.

In **Attachment A**, four maps show the existing and future land uses within the coastal hazard zone (Category 1 storm surge zone) and the hurricane vulnerability zone (Category 1 evacuation zone). **Table 2.3** presents the acres of land in the coastal hazard zone and in the hurricane vulnerability zone. Forty-one point eight percent of the land in the coastal hazard zone and 50.8% of land in the hurricane vulnerability zone is in Parks, Conservation Areas and Golf Courses use classification, much of it in public ownership. A major tract of land is the 15,000-acre Tiger Bay State Forest, which consists of large areas of swamp that also function as a natural water recharge area. This is a very good use of land in a hazard area since it preserves some of the natural features and keeps the population out of the way of the hurricane's biggest impacts. Single-family homes and vacant land consume another 27% of the land area. **Table 2.4** presents future land use estimates and a breakdown of how currently undeveloped land has been designated for future use. According to the data used, 56.9% of the undeveloped land in the coastal hazard zone is within the incorporated communities. The largest acreage (970 acres) in the unincorporated county is classified as Environmental Systems Corridor. The remainder is scattered among a host of other future land use categories.

In **Attachment B**, two maps present the existing and future land uses within a 100-year flood zone. There are large swaths of flood-prone areas present in the County; however, a majority of them are west of U.S. Highway 1 where there are many wetlands. The total amount of land in these special flood hazard areas is 353,897 acres countywide. A total of 15.7% of these acres are currently undeveloped. As shown in **Table 2.3**, besides being vacant, most of the flood prone areas are located in either Agriculture or Parks, Conservation Areas, and Golf Courses land use categories. **Table 2.4** shows that in the unincorporated county, 48.7% of the undeveloped lands have a Environmental Systems Corridors land use designation.

Maps presenting the land uses associated with high-risk wildfire zones are shown in **Attachment C**. Wildfire risk areas can be found throughout the County, with most of the larger contiguous areas being west of Interstate 95. A total of 17.4% of the land within these wildfire zones is currently vacant, according to the data in **Table 2.3**. Of those 16,549 undeveloped acres, 29% is shown to be designated either Environmental Systems Corridors or Forestry (**Table 2.4**).

Maps showing the sinkhole hazard zones and associated existing and future land uses can be found in **Attachment D**. According to the Volusia County Local Hazard Mitigation Plan, the risk for sinkholes is low except for in a small area situated where Routes 40 and 17 intersect. **Table 2.3** shows that of the 242,622 acres in the unincorporated county vulnerable to sinkholes, 50% of the designated future land uses are either in Agricultural or Parks, Conservation Areas, and Golf Courses classifications. **Table 2.4** shows that the Future Land Use for 34.2% of the undeveloped land risk to sinkholes located in the municipalities. In the unincorporated areas of the County, areas at risk are either designated as Agriculture or Environmental Systems Corridor. Ideally this hazard zone should be restricted from development or at least regulated so that geological testing must be done before structures can be built.

Table 2.5 presents the existing land uses for the acres in Volusia County that are incorporated within one of the 17 municipalities. A majority of the hazard areas that are incorporated are either in residential use or vacant. Most vacant acres within the municipalities are probably designated for future residential use. The municipalities therefore have even more reason to make changes to their land use patterns since hazard zones within their boundaries are more likely to be populated than those in the unincorporated County.

Table 2.3 Total Unincorporated Acres in Hazard Areas by Existing Land Use Category

Existing Land Use Category		Coastal Hazard Zone	Hurricane Vulnerability Zone	Flood	Wildfire Susceptible Areas	Sinkholes
Agriculture	Acres	232.5	1,017.7	115,634.0	37,609.0	66,402.8
	%	0.7	4.1	32.7	39.5	27.4
Attractions, Stadiums, Lodging	Acres	333.5	78.7	412.9	70.4	417.3
	%	1.0	0.3	0.1	0.1	0.2
Places of Worship	Acres	92.1	43.7	97.0	194.0	780.3
	%	0.3	0.2	0.0	0.2	0.3
Commercial	Acres	647.2	640.5	1,335.8	299.2	4,407.3
	%	2.0	2.6	0.4	0.3	1.8
Government, Institutional, Hospitals, Education	Acres	5,434.1	1,269.1	15,922.8	4,408.4	9,636.6
	%	16.6	5.1	4.5	4.6	4.0
Industrial	Acres	79.8	126.0	517.6	177.5	1,092.1
	%	0.2	0.5	0.2	0.2	0.5
Parks, Conservation Areas, Golf Courses	Acres	13,662.7	12,728.0	137,912.3	21,990.9	62,224.7
	%	41.8	50.8	39.0	23.1	25.7
Residential Group Quarters, Nursing Homes	Acres	116.6	126.2	222.3	46.2	362.3
	%	0.4	0.5	0.1	0.1	0.2
Residential Multi-Family	Acres	1,019.5	342.9	2,044.0	549.8	2,181.6
	%	3.1	1.4	0.6	0.6	0.9
Residential Mobile Home, or Commercial Parking Lot	Acres	135.3	377.4	3,183.9	2,420.1	4,437.4
	%	0.4	1.5	0.9	2.5	1.8
Residential Other	Acres	21.4	0.0	0.0	0.0	0.0
	%	0.1	0.0	0.0	0.0	0.0
Residential Single-Family	Acres	5,036.2	2,989.1	13,243.8	10,127.5	40,435.5
	%	15.4	11.9	3.7	10.6	16.7
Submerged Land (Water Bodies)	Acres	130.2	84.7	667.9	30.5	231.6
	%	0.4	0.3	0.2	0.0	0.1
Transportation, Communication, Rights-of-Way	Acres	60.6	11.2	510.3	79.4	136.9
	%	0.2	0.0	0.1	0.1	0.1
Utility Plants and Lines, Solid Waste Disposal	Acres	1,917.4	1,383.1	6,616.3	667.5	4,071.4
	%	5.9	5.5	1.9	0.7	1.7
Vacant	Acres	3,796.9	3,817.7	55,575.8	16,548.5	45,804.3
	%	11.6	15.3	15.7	17.4	18.9
Total	Acres	32,716.1	25,035.7	353,896.7	95,218.8	242,622.1
	%	100.0	100.0	100.0	100.0	100.0

Data from: Florida Department of Community Affairs, 2005a.

Table 2.4 Total and Undeveloped Acres in Hazard Areas by Future Land Use Category for the Unincorporated County

Future Land Use Category		Coastal Hazard Zone		Hurricane Vulnerability Zone		Flood		Wildfire Susceptible Areas		Sinkhole	
		Total	Undev.	Total	Undev.	Total	Undev.	Total	Undev.	Total	Undev.
Agriculture Resource	Acres	4	0	588	48	17,052	3,558	12,482	1,808	32,396	3,628
	%	0.0%	0.0%	2.3%	1.3%	4.8%	6.4%	13.1%	10.9%	13.4%	7.9%
Commercial	Acres	66	16	68	35	216	91	360	165	1,056	481
	%	0.2%	0.4%	0.3%	0.9%	0.1%	0.2%	0.4%	1.0%	0.4%	1.1%
Commercial/Office	Acres	0	0	0	0	21	0	15	0	0	0
	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Conservation	Acres	10,031	2	11,210	47	93,850	44	11,193	14	53,360	151
	%	30.7%	0.0%	44.8%	1.2%	26.5%	0.1%	11.8%	0.1%	22.0%	0.3%
Coordinated Development District	Acres	0	0	0	0	0	0	27	20	496	194
	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.2%	0.4%
Environmental Systems Corridor	Acres	4,453	970	2,230	505	106,989	27,043	9,474	2,454	21,302	5,259
	%	13.6%	25.5%	8.9%	13.2%	30.2%	48.7%	9.9%	14.8%	8.8%	11.5%
Federal Highway	Acres	0	0	0	0	20	17	10	8	3	2
	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Forestry Resource	Acres	0	0	0	0	44,470	7,323	21,920	2,567	17,508	4,319
	%	0.0%	0.0%	0.0%	0.0%	12.6%	13.2%	23.0%	15.5%	7.2%	9.4%
Generalized Activity Center	Acres	0	0	0	0	288	27	36	15	0	0
	%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%
Incorporated	Acres	13,245	2,159	8,046	2,332	44,708	7,620	20,675	3,797	61,031	15,649
	%	40.5%	56.9%	32.1%	61.1%	12.6%	13.7%	21.7%	22.9%	25.2%	34.2%
Industrial	Acres	4	2	132	51	441	234	266	92	287	95
	%	0.0%	0.1%	0.5%	1.3%	0.1%	0.4%	0.3%	0.6%	0.1%	0.2%
Low Impact Urban	Acres	62	33	103	48	2,918	1,146	1,478	612	1,688	736
	%	0.2%	0.9%	0.4%	1.2%	0.8%	2.1%	1.6%	3.7%	0.7%	1.6%
Mixed Use	Acres	0	0	0	0	26	7	37	13	160	43
	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%
Office	Acres	0	0	0	0	17	17	0	0	0	0
	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Public/Semi-Public	Acres	0	0	0	0	2,088	9	472	10	417	36
	%	0.0%	0.0%	0.0%	0.0%	0.6%	0.0%	0.5%	0.1%	0.2%	0.1%
Recreation	Acres	63	14	34	19	132	21	18	0	334	0
	%	0.2%	0.4%	0.1%	0.5%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%
Rural	Acres	285	51	334	163	10,424	4,147	10,519	2,737	26,840	7,461
	%	0.9%	1.3%	1.3%	4.3%	2.9%	7.5%	11.0%	16.5%	11.1%	16.3%
Tourist Commercial	Acres	0	0	0	0	48	47	10	4	0	0
	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%
Urban High Density	Acres	217	31	0	0	168	39	88	5	144	24
	%	0.7%	0.8%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%	0.1%	0.1%

Table 2.4 Total and Undeveloped Acres in Hazard Areas by Future Land Use Category for the Unincorporated County

Future Land Use Category		Coastal Hazard Zone		Hurricane Vulnerability Zone		Flood		Wildfire Susceptible Areas		Sinkhole	
		Total	Undev.	Total	Undev.	Total	Undev.	Total	Undev.	Total	Undev.
Urban Low Density	Acres	928	168	808	197	5,118	2,202	5,091	1,919	15,743	5,589
	%	2.8%	4.4%	3.2%	5.2%	1.4%	4.0%	5.3%	11.6%	6.5%	12.2%
Urban Medium Density	Acres	1,070	169	601	206	1,290	451	822	272	2,976	859
	%	3.3%	4.4%	2.4%	5.4%	0.4%	0.8%	0.9%	1.6%	1.2%	1.9%
Water	Acres	2,288	183	882	166	23,614	1,534	227	36	6,881	1,279
	%	7.0%	4.8%	3.5%	4.3%	6.7%	2.8%	0.2%	0.2%	2.8%	2.8%
Total	Acres	32,716	3,797	25,036	3,818	353,897	55,576	95,219	16,549	242,622	45,804
	%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Data from: Florida Department of Community Affairs, 2005.

Table 2.5 Total Incorporated Acres in Hazard Areas by Existing Land Use Category

Existing Land Use Category		Coastal Hazard Zone	Hurricane Vulnerability Zone	Flood	Wildfire Susceptible Areas	Sinkholes
Agriculture	Acres	18.7	9.1	14,226.1	6,714.4	7,033.2
	%	0.1	0.1	25.2	32.3	11.0
Attractions, Stadiums, Lodging	Acres	229.8	215.4	173.4	8.7	242.8
	%	1.6	1.8	0.3	0.0	0.4
Places of Worship	Acres	71.3	69.8	94.8	122.2	566.0
	%	0.5	0.6	0.2	0.6	0.9
Commercial	Acres	556.2	450.3	946.3	148.0	3,027.4
	%	4.0	3.7	1.7	0.7	4.7
Government, Institutional, Hospitals, Education	Acres	2,807.4	2,471.2	7,515.4	3,400.8	6,362.9
	%	20.0	20.6	13.3	16.4	9.9
Industrial	Acres	79.4	13.2	453.0	107.7	733.4
	%	0.6	0.1	0.8	0.5	1.2
Parks, Conservation Areas, Golf Courses	Acres	3,097.6	2,717.3	12,540.3	3,006.2	3,742.1
	%	22.1	22.6	22.2	14.5	5.8
Residential Group Quarters, Nursing Homes	Acres	11.4	10.9	34.6	13.2	143.6
	%	0.1	0.1	0.1	0.1	0.2
Residential Multi-Family	Acres	816.4	715.2	1,607.1	401.5	1,784.8
	%	5.8	6.0	2.8	1.9	2.8
Residential Mobile Home, or Commercial Parking Lot	Acres	55.5	41.5	313.2	119.7	745.0
	%	0.4	0.3	0.6	0.6	1.2
Residential Other	Acres	22.1	21.9	0.0	0.0	0.0
	%	0.2	0.2	0.0	0.0	0.0
Residential Single-Family	Acres	3,185.9	2,851.7	5,514.4	2,654.9	19,953.8
	%	22.7	23.7	9.8	12.8	31.2
Submerged Land (Water Bodies)	Acres	99.4	65.8	378.3	10.9	85.8
	%	0.7	0.6	0.7	0.1	0.1
Transportation, Communication, Rights-of-Way	Acres	41.9	24.3	84.1	18.7	60.0
	%	0.3	0.2	0.2	0.1	0.1
Utility Plants and Lines, Solid Waste Disposal	Acres	660.1	474.6	2,761.7	239.4	3,012.7
	%	4.7	4.0	4.9	1.2	4.7
Vacant	Acres	2,297.3	1,874.4	9,923.1	3,802.7	16,546.1
	%	16.4	15.6	17.5	18.3	25.8
Total	Acres	14,050.4	12,026.4	56,565.6	20,769.1	64,039.6
	%	100.0	100.0	100.0	100.0	100.0

Data from: Florida Department of Community Affairs, 2005.

3. Existing Mitigation Measures

Local Mitigation Strategy

Volusia County's LMS includes the following goals and objectives:

- 1. Local government will have the capability to develop, implement, and maintain effective mitigation programs**
 - Data and information needed for defining hazards, risk areas, and vulnerabilities in the community will be obtained
 - The capability to effectively utilize available data and information related to mitigation planning and program development will be available
 - The effectiveness of mitigation initiatives implemented in the community will be measured and documented
 - There will be a program to derive mitigation "lessons learned" from each significant disaster event occurring in or near the community
 - Up-to-date technical skills in mitigation planning and programming will be available for the community

- 2. All sectors of the community will work together to create a disaster-resistant community by the year 2020**
 - A business continuity and recovery program will be established and implemented in the community
 - Local agencies and organizations will establish specific interagency agreements for the development and implementation of mitigation-related projects and programs
 - Local elected governing bodies will promulgate the local mitigation plan and support community mitigation programming
 - Outreach programs to gain participation in mitigation programs by business, industry, institutions, and community groups will be developed and implemented
 - The community will be periodically updated regarding local efforts in mitigation planning and programming
 - The community's public and private sector organizations will partner to promote hazard mitigation programming throughout the community

- 3. The community will have the capability to initiate and sustain emergency response operations during and after a disaster**
 - Designated evacuation routes will be relocated, retrofitted, or modified to remain open before, during, and after disaster events
 - Designated evacuation shelters will be retrofitted or relocated to ensure their operability during and after disaster events
 - Emergency services organizations will have the capability to detect emergency situations and promptly initiate emergency response operations
 - Local emergency services facilities will be retrofitted or relocated to withstand the structural impacts of disasters
 - Response capabilities will be available to protect visitors, special needs individuals, and the homeless from a disaster's health and safety impacts
 - Shelters or structures for vehicles and equipment needed for emergency services operation will be retrofitted or relocated to withstand disaster impacts
 - Utility and communications systems supporting emergency services operations will be retrofitted or relocated to withstand the impacts of disasters
 - Vehicle access routes to key health care facilities will be protected from blockage as a result of a disaster

- 4. The continuity of local government operations will not be significantly disrupted by disasters**
 - Buildings and facilities used for the routine operations of government will be retrofitted or relocated to withstand the impacts of disasters
 - Community redevelopment plans will be prepared to guide decision-making and resource allocation by local government in the aftermath of a disaster
 - Important local government records and documents will be protected from the impacts of disasters
 - Plans and programs will be available to assist local government employees in retrofitting or relocating their homes to ensure their availability during a disaster
 - Plans will be developed, and resources identified, to facilitate reestablishing local government operations after a disaster
 - Redundant equipment, facilities, and/or supplies will be obtained to facilitate reestablishing local government operations after a disaster

- 5. The threat of disasters to the health, safety, and welfare of the community's residents and visitors will be minimized**
 - Adequate systems for notifying the public at risk and providing emergency instruction during a disaster will be available in all identified hazard areas
 - Effective structural measures will be developed to protect residential areas from the physical impacts of disasters
 - Facilities in the community posing an extra health or safety risk when damaged or disrupted will be made less vulnerable to the impacts of a disaster
 - Public and private medical and health care facilities in the community will be retrofitted or relocated to withstand the impacts of disasters
 - Residential structures will be removed or relocated from defined hazard areas
 - Residential structures will be retrofitted to withstand the physical impacts of disasters
 - Safety devices on transportation networks will not fail because of a disaster
 - Structures, facilities, and systems serving visitors to the community will be prepared to meet their immediate health and safety needs
 - There will be adequate resources, equipment, and supplies to meet victims' health and safety needs after a disaster

- 6. The policies and regulations of local government will support effective hazard mitigation programming throughout the community**
 - All reconstruction or rehabilitation of local government facilities will incorporate techniques to minimize the physical or operational vulnerability to disasters
 - Land use policies, plans, and regulations will discourage or prohibit inappropriate location of structures or infrastructure components in areas of higher risk
 - Local government will ensure that hazard mitigation needs and programs are given appropriate emphasis in resource allocation and decision-making
 - Local governments will establish and enforce building and land development codes that are effective in addressing the hazards threatening the community
 - Local governments will protect high hazard natural areas from new or continuing development
 - Local jurisdictions will participate fully in the National Flood Insurance Program and the associated Community Rating System
 - New local government facilities will be located outside of hazard areas and/or will be designed to not be vulnerable to the impacts of such hazards
 - Reconstruction and rehabilitation of structures and utilities in the community will incorporate appropriate hazard mitigation techniques
 - Regulations will be established and enforced to ensure that public and private property maintenance is consistent with minimizing vulnerabilities to disaster

7. **Residents of the community will have homes, institutions, and places of employment that are less vulnerable to disaster**
 - Economic incentive programs for the general public, businesses, and industry to implement structural and non-structural mitigation measures will be established
 - Local government will support key employers in the community in the implementation of mitigation measures for their facilities and systems
 - Programs for removal, relocation, or retrofitting of vulnerable structures and utilities in hazard areas will be established and implemented
 - The vulnerability to disasters of schools, libraries, museums, and other institutions important to the daily lives of the community will be minimized

8. **The economic vitality of the community will be enhanced by the mitigation strategy, pre- and post-disaster recovery planning**
 - Components of the infrastructure needed by the community's businesses and industries will be protected from the impacts of disaster
 - Local government emergency response and disaster recovery plans will appropriately consider the needs of key employers in the community
 - Local government will encourage community businesses and industries to make their facilities and operations disaster resistant
 - Local government will establish programs, facilities, and resources to support business resumption activities by impacted local businesses and industry
 - Local government will implement programs to address public perceptions of community condition and functioning in the aftermath of a disaster
 - Local government will strive to diversify the employment base of the community

9. **The availability and functioning of the community's infrastructure will be minimally disrupted by a disaster**
 - Local governments will encourage hazard mitigation programming by private sector organizations owning or operating key community utilities
 - Routine maintenance of the community's infrastructure will be done to minimize the potential for system failure because of or during disaster
 - Sources of energy normally used by the community will not be unwarrantedly vulnerable to the impacts of a disaster
 - The telecommunications systems and facilities serving the community will not be unwarrantedly vulnerable to the impacts of a disaster
 - Transportation facilities and systems serving the community will be constructed and/or retrofitted to minimize the potential for disruption during a disaster
 - Water and sewer services in the community will not fail because of a disaster

10. **Members of the community will understand the hazards threatening local areas and the techniques to minimize vulnerability to those hazards**
 - All interested individuals will be encouraged to participate in hazard mitigation planning and training activities
 - Education programs in risk communication and hazard mitigation will be established and implemented
 - Managers of public facilities will be knowledgeable in hazard mitigation techniques and the components of the community's mitigation plan
 - Technical training in mitigation planning and programming will be given to appropriate local government employees
 - The owners and operators of businesses and industries in the community will be knowledgeable in appropriate hazard mitigation techniques
 - The public living or working in defined hazard areas will be aware of that fact, understand their vulnerability, and know appropriate mitigation techniques
 - The public will have facilitated access to information needed to understand their vulnerability to disasters and effective mitigation techniques

Comprehensive Emergency Management Plan

The Volusia County Comprehensive Emergency Management Plan (CEMP) was not available for review at the time this profile was drafted. The final version of this document will contain a review of the Mitigation Annex of the CEMP.

Post-Disaster Redevelopment Plan

A Post-Disaster Redevelopment Plan (PDRP) for Volusia County was not available for review at the time this profile was drafted. If Volusia 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

With the exception of Lake Helen and Pierson, as of June 2004, all other local governments in Volusia County participate in the National Flood Insurance Program. Also as of June 2004, the only governments not participating in the Community Rating System Program are DeBarry, Deland, Deltona, Lake Helen, Oak Hill, and Pierson.

4. Comprehensive Plan Review

Volusia County's Comprehensive Plan (adopted in 2002) 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.

Volusia's Comprehensive Plan had many policies considered to be best management practices for mitigating hurricane and coastal surge impacts. There were policies aimed at preserving natural hazard protection features of the environment, such as beaches, dunes, and wetlands. Building upon these policies were also policies aimed at acquiring land in the Coastal High Hazard Area (CHHA) and preserving these areas for open space and recreation. For those coastal hazard areas that cannot be preserved, the County has policies for limiting development by not allowing increased densities through land use amendments in the hurricane vulnerability zone and by prohibiting building seaward of the Coastal Construction Control Line (CCCL). The Plan also limits public expenditures in the CHHA to issues of providing access, resource restoration, and passive recreation and encourages infrastructure and damaged structures to be relocated outside of the CHHA, if feasible. The Coastal Management Element sets a clearance time of 19 hours based on a level of service "D." These policies support the Local Hazard Mitigation Plan (LHMP) Goal 5. Evacuation was also addressed in the Future Land Use Element in more general terms, i.e., "hurricane evacuation times do not exceed the ability of Volusia County to provide them." Evacuation supports Goal 3 in the LHMP. The Plan contains policies in several elements directing the location of new fire and law enforcement facilities outside areas susceptible to hurricane and flooding. The School Board is encouraged to locate its future school facilities similarly. Location of public facilities outside hazard areas supports Goal 6 of the LHMP. The Plan cites that reconstruction shall be consistent with the Recovery Annex of the Comprehensive Emergency Management Plan until such time a Post-Disaster Redevelopment Plan has been adopted. The Plan does not address temporary moratoriums or an expedited building permitting process, but does contain policies in the Coastal Management Element that address rebuild of damaged structures. Post-disaster redevelopment policies support Goal 6 of the LHMP.

Flooding was addressed in the Comprehensive Plan in multiple policies. There were policies for protecting and acquiring land in floodplains. There also is a policy to continue to participate in the National Flood Insurance Program. The Plan is silent on participation in the Community Rating System (CRS). The Conservation Element promotes flood protection through such actions as public acquisition, land use controls, and conservation easements. The Drainage Element states that the County encourages proper maintenance of stormwater management systems. In this element, it states that Level of Service for storm water quality and quantity is based on St. Johns River Water Management District standard 24-hour, 25-year frequency storm.

While Volusia County has had a number of major wildfires, the Comprehensive Plan contains one policy in the Future Land Use Element that addresses this hazard. The policy encourages new development to follow fire safety standards set out in the Florida Division of Forestry publication "Protecting Florida Homes from Wildfire." This policy supports LHMP Goal 5 which seeks to minimize disaster impacts on residential structures. The Future Land Use Element contains a policy that encourages cluster development to preserve environmentally sensitive land; however, this policy could be expanded to reflect that this development technique also is an appropriate strategy to mitigate wildfire.

One policy in the Aquifer Recharge Element and another in the Drainage Sub-Element mention sinkholes. The Aquifer Recharge policy states that "Future landfills shall not be located within prime (or high) aquifer recharge areas or karst areas prone to sinkhole activity," and the Drainage policy states, "Volusia County shall develop minimum standards to regulate stormwater discharge into surface waters and primary sinkholes in karst terrain through the use of percolation ponds and other appropriate methods."

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.

Volusia 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.

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 end up with specific recommendations tailored and acceptable to each county. While the Profile addresses hurricanes, flooding, wildfire and sinkholes, during the update of the local comprehensive plan, the county should consider other hazards if appropriate, such as tornadoes and soil subsidence.

Comprehensive Plan

The following is a set of suggested recommendations for constitution. Modification and other recommendations are expected to be generated from the workshop.

1. Require as a condition of approval for development proposed in high risk wildfire areas the development of a management plan describing how wildfire risk will be minimized.
2. Include policy that emphasizes importance of public and private sector cooperation in order to be able to recover from disaster events more quickly. This is achieved through the LHMP Steering Committee, LHMP Goal 8.
3. Economic vitality is the essence of LHMP Goal 9. The Comprehensive Plan needs policy(s) to support minimizing disruption following a disaster event.
4. The issue of continuity of key public services needs to be addressed. This includes telecommunication, water, sewer, and power.
5. The Comprehensive Plan needs to have policy emphasizing the importance of maintaining public facilities to ensure they function during and after events such as the hurricanes of 2004.
6. Prohibit or restrict the placement of new manufactured/mobile homes in the Hazard Vulnerability Zone.

7. In areas outside of the Hazard Vulnerability Zone, where manufactured housing developments are being proposed, require as a condition of approval that a hardened community center or structure be built to sustain hurricane- and possibly tornado-force winds.
8. Have a policy that states that Volusia County Emergency Management, working with municipalities and Volusia School Board, will determine annually where temporary debris sites will be located. This should be accomplished prior to the beginning of the annual hurricane season.
9. Develop a policy for expedited permitting following a disaster event, as long as the permit is in accordance with the Post-Disaster Redevelopment Plan.
10. Working with the LHMP Steering Committee, develop a sustained public awareness program regarding multiple hazards such as flooding, hurricanes, and wildfire.
11. The City should have a policy that states it will undertake a study to determine the vulnerability of its designated historic structures and how best to protect each.
12. Add policy that urges the retrofitting of existing housing stock whenever possible.
13. Cite the need for good hazard planning data in order to make good decisions.

There are other policies that are considered best management practices for hazard mitigation that could be considered by the County as they update their Comprehensive Plan. The final draft of this profile will include more of these options.

Local Mitigation Strategy

The LMS could also be enhanced to include some of the items that the Comprehensive Plan already has or that are recommended for inclusion. For instance, the identification of hazard zones with existing and future land uses overlain could be included in both plans. Also the objectives in the LMS are broad and could include more detailed policies such as the ones in the Comprehensive Plan. Overall the LMS could be enhanced and further connected with the County Comprehensive Plan.

6. Municipal Case Study: New Smyrna Beach

As part of this study, a similar analysis to that of the County Profile was completed for a statewide sample of 14 Florida municipalities, including New Smyrna Beach in Volusia County. The results of the analysis are provided in this section.

Hazards Identification

According to the Volusia County LMs, the highest ranked hazards for New Smyrna Beach are flooding, wildland fire, and high winds. In 1997 and again in 2000, the City experienced tornadoes. Sinkholes are not considered a high risk hazard.

Analysis of Current and Future Vulnerability

New Smyrna Beach consists of a mainland area as well as a major beach community linked to the mainland by two causeways. The Comprehensive Plan indicated that there has been growth pressure along the causeways, which increases the vulnerability of the safe evacuation of the beachside population. Maps of the existing and future land uses within the coastal hazard zone (Category 1 storm surge zone) and the hurricane vulnerability zone (Category 1 evacuation zone) are found in **Attachment A. Table 6.1** shows that 22.8% of the land in the hurricane vulnerability

zone (HVZ) is either in single-family or multi-family residential use. However in **Table 6.2**, we see that 77.3% of the undeveloped land in the HVZ is designated for conservation use in the future.

Flooding is a major hazard. Much of the city is situated within the 100-year flood zone, as defined by the National Flood Insurance Program (NFIP) and seen in the maps in **Attachment B**. As documented in **Table 6.1**, 27.2% of the land in the coastal hazard zone, which is subject to surge, is still vacant. Of the land in the 100-year flood zone, 29.4% is vacant as well. Of the undeveloped lands in the floodplain, a majority are designated for future use as urban low intensity or urban transition areas as seen in **Table 6.2**. Several years ago, the City annexed more than 7,000 acres, which is now known as West New Smyrna. According to NFIP data, this area is subject to extensive flooding; however, the positive side is that the area is not yet developed.

The city is also vulnerable to wildfire as seen in the maps in **Attachment C**. In 2000, the City experienced a 40-acre wildfire. Most of the 3,215 acres susceptible to wildfires are either in agricultural use or vacant. Of those undeveloped acres, **Table 6.2** shows that 48.7% are in the urban transition area future land use designation.

In **Attachment D**, there are maps of New Smyrna Beach showing existing and future land uses within sinkhole risk areas. Unfortunately, 22.9% of the land at risk from sinkholes is currently in single-family residential use. For the undeveloped acres at risk, though, 24.2% are designated for future conservation use.

Being an older municipality, there are several areas in New Smyrna Beach undergoing redevelopment. Development proposals for these areas would increase the density and intensity of land use. The Community Redevelopment Agency needs to make sure hazard mitigation strategies are considered when evaluating development proposals and/or redevelopment plans.

The City also has historically significant housing in a four to five block wide area east of U.S. 1 in the northwest sector of the City. Approximately 603 residential structures are documented on the Florida Master Site File, Division of Historical Resources, Bureau of Historic Preservation.

Table 6.1 Total Acres in Hazard Areas by Existing Land Use Category

Existing Land Use Category		Coastal Hazard Zone	Hurricane Vulnerability Zone	Flood	Wildfire Susceptible Areas	Sinkholes
Agriculture	Acres	1.3	0.0	7,572.3	1,239.7	1.1
	%	0.0	0.0	42.9	38.6	0.0
Attractions, Stadiums, Lodging	Acres	8.7	10.7	6.0	0.0	6.0
	%	0.2	0.2	0.0	0.0	0.2
Places of Worship	Acres	9.4	21.6	12.0	8.5	37.5
	%	0.2	0.5	0.1	0.3	0.9
Commercial	Acres	123.5	146.5	123.3	10.0	118.8
	%	2.5	3.2	0.7	0.3	3.0
Government, Institutional, Hospitals, Education	Acres	1,848.8	1,742.0	2,842.1	582.1	1,112.4
	%	37.3	38.3	16.1	18.1	28.1
Industrial	Acres	12.5	4.7	68.7	11.4	79.1
	%	0.3	0.1	0.4	0.4	2.0
Parks, Conservation Areas, Golf Courses	Acres	348.7	181.2	549.5	355.1	547.1
	%	7.0	4.0	3.1	11.0	13.8
Residential Group Quarters, Nursing Homes	Acres	2.2	2.0	2.0	0.0	0.7
	%	0.0	0.0	0.0	0.0	0.0
Residential Multi-Family	Acres	151.4	156.3	88.3	20.1	82.0
	%	3.1	3.4	0.5	0.6	2.1
Residential Mobile Home, or Commercial Parking Lot	Acres	4.2	4.0	8.7	0.7	6.7
	%	0.1	0.1	0.1	0.0	0.2
Residential Other	Acres	2.7	2.9	0.0	0.0	0.0
	%	0.1	0.1	0.0	0.0	0.0
Residential Single-Family	Acres	816.6	882.4	807.5	217.6	908.2
	%	16.5	19.4	4.6	6.8	22.9
Submerged Land (Water Bodies)	Acres	35.2	27.0	59.5	0.7	30.1
	%	0.7	0.6	0.3	0.0	0.8
Transportation, Communication, Rights-of-Way	Acres	2.2	2.2	22.3	3.3	12.5
	%	0.0	0.1	0.1	0.1	0.3
Utility Plants and Lines, Solid Waste Disposal	Acres	243.7	203.5	304.8	19.4	206.4
	%	4.9	4.5	1.7	0.6	5.2
Vacant	Acres	1,345.8	1,166.4	5,183.6	746.8	815.3
	%	27.2	25.6	29.4	23.2	20.6
Total	Acres	4,956.8	4,553.4	17,650.5	3,215.3	3,963.9
	%	100.0	100.0	100.0	100.0	100.0

Data from: Florida Department of Community Affairs, 2005.

Table 6.2 Total and Undeveloped Acres in Hazard Areas by Future Land Use Category

Future Land Use Category		Coastal Hazard Zone		Hurricane Vulnerability Zone		Flood		Wildfire Susceptible Areas		Sinkhole	
		Total	Undev.	Total	Undev.	Total	Undev.	Total	Undev.	Total	Undev.
Activity Center	Acres	0	0	0	0	245	14	63	3	0	0
	%	0.0%	0.0%	0.0%	0.0%	1.4%	0.3%	2.0%	0.4%	0.0%	0.0%
Agricultural	Acres	0	0	0	0	914	521	74	15	0	0
	%	0.0%	0.0%	0.0%	0.0%	5.2%	10.0%	2.3%	2.0%	0.0%	0.0%
Commercial	Acres	280	64	280	57	235	38	23	7	156	28
	%	5.6%	4.8%	6.1%	4.9%	1.3%	0.7%	0.7%	1.0%	3.9%	3.4%
Conservation	Acres	3,007	957	2,742	901	3,609	1,302	134	17	671	197
	%	60.7%	71.1%	60.2%	77.3%	20.4%	25.1%	4.2%	2.2%	16.9%	24.2%
Environmental Systems Corridor	Acres	0	0	0	0	1,734	165	19	0	0	0
	%	0.0%	0.0%	0.0%	0.0%	9.8%	3.2%	0.6%	0.0%	0.0%	0.0%
Forestry Resource	Acres	0	0	0	0	1,156	0	192	0	0	0
	%	0.0%	0.0%	0.0%	0.0%	6.5%	0.0%	6.0%	0.0%	0.0%	0.0%
High Density Residential, 8.01 to 12 DU	Acres	0	0	0	0	0	0	0	0	0	0
	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
High Density Residential, 8.01 to 18 DU	Acres	0	0	0	0	0	0	0	0	0	0
	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Industrial	Acres	29	0	28	1	214	32	135	20	404	62
	%	0.6%	0.0%	0.6%	0.1%	1.2%	0.6%	4.2%	2.7%	10.2%	7.5%
Low Density Residential, up to 5 DU/AC	Acres	0	0	0	0	0	0	0	0	0	0
	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Marina	Acres	55	2	49	1	72	3	0	0	52	0
	%	1.1%	0.1%	1.1%	0.1%	0.4%	0.1%	0.0%	0.0%	1.3%	0.0%
Medium Density Residential, 5.01 to 8 DU	Acres	0	0	0	0	0	0	0	0	0	0
	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Mixed Uses Area	Acres	2	0	60	7	2	0	0	0	74	13
	%	0.0%	0.0%	1.3%	0.6%	0.0%	0.0%	0.0%	0.0%	1.9%	1.6%
Public Land Use	Acres	6	0	17	0	97	0	171	0	257	0
	%	0.1%	0.0%	0.4%	0.0%	0.5%	0.0%	5.3%	0.0%	6.5%	0.0%
Recreation	Acres	76	0	66	0	347	18	259	11	340	16
	%	1.5%	0.0%	1.4%	0.0%	2.0%	0.4%	8.1%	1.5%	8.6%	1.9%
S.R.44 PUD	Acres	0	0	0	0	12	6	13	12	0	0
	%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.4%	1.6%	0.0%	0.0%
Schools	Acres	33	2	44	2	73	5	25	0	22	0
	%	0.7%	0.1%	1.0%	0.1%	0.4%	0.1%	0.8%	0.0%	0.6%	0.0%
Urban Low Intensity	Acres	0	0	0	0	6,374	2,003	5	5	0	0
	%	0.0%	0.0%	0.0%	0.0%	36.1%	38.6%	0.1%	0.6%	0.0%	0.0%
Urban Transition Area	Acres	0	0	0	0	6,374	2,003	1,126	364	0	0
	%	0.0%	0.0%	0.0%	0.0%	36.1%	38.6%	35.0%	48.7%	0.0%	0.0%
Total	Acres	4,957	1,346	4,553	1,166	17,650	5,184	3,215	747	3,964	815
	%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Data from: Florida Department of Community Affairs, 2005.

DU = Dwelling Unit.
PUD = Planned Unit Development.

Comprehensive Plan Review

The New Smyrna Beach Comprehensive Plan was adopted in July 1990 and last revised in 1995. It has been reviewed in order to see what the City has 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 F**. The following is a summary that evaluates whether the four major hazards (surge, flood, sinkholes, and wildfire) have been addressed.

Surge and flooding are addressed by the City in several Plan elements. The Plan does contain policies to prohibit new public expenditures that subsidize development in the coastal high hazard area and locate new hurricane shelters outside the hurricane vulnerability zone. Also, while not encouraged, if new public facilities are built in the hurricane vulnerability zone, the structures must be flood-proofed. The Comprehensive Plan contains policies that address the protection of floodplains and suggests the possibility of acquisition. If implemented, its policy of discouraging development by limiting public expenditures in coastal high hazard areas can be effective in not expanding the existing vulnerability. The Plan also contains policies that recognize the need to maintain the structural integrity of the beaches and dunes, which are important in reducing the surge energy of the waves.

There were no policies addressing either sinkholes or wildfire.

Recommendations

As noted earlier, sinkholes were not considered a major hazard within the City. Also, the City has addressed flooding and surge issues; however, based on our analysis some recommended integration strategies are suggested.

1. Since New Smyrna Beach has experienced tornadoes, the Comprehensive Plan should have a policy that either encourages the use of safe rooms or possibly requires safe rooms in all new construction as well as major redevelopment or rebuilding of individual homes.
2. The City should add a policy that states that hazard mitigation issues and concerns will be integrated into the redevelopment planning and/or project development processes.
3. The City needs to make sure that it can evacuate its barrier island; therefore, it needs to have a policy that not only states it will adopt an emergency evacuation plan but also links an acceptable Level of Service standard to evacuation. Possibly the City could consider a reverse lane policy that would go into effect if a hurricane is imminent.
4. Prohibit or restrict the placement of new manufactured/mobile homes in the hazard vulnerability zone.
5. In areas outside of the hazard vulnerability zone, where manufactured housing developments are being proposed, require as a condition of approval that a hardened community center or structure be built to sustain hurricane- and possibly tornado-force winds.
6. Have a policy that states that the City, working with Volusia County Emergency Management, municipalities, and the Volusia County School Board, will determine annually where temporary debris sites will be located. This should be accomplished prior to the beginning of the annual hurricane season.
7. Develop a policy for expedited permitting following a disaster event as long as the permit is in accordance with the Post-Disaster Redevelopment Plan.

8. Working with the Local Mitigation Steering Committee, develop a sustained public awareness program regarding multiple hazards such as flooding, hurricanes, and wildfire.
9. Establish a policy that states that the City will develop a repetitive loss structure plan to eliminate the reoccurrence of flooding.
11. The City should have a policy that states it will undertake a study to determine the vulnerability of its designated historic structures and how best to protect each.
12. Consider implementing a series of wildfire policies/initiatives or a comprehensive wildfire program that addresses the following (another option is to support the County in developing such a program on a countywide basis):
 - In areas of wildfire risk, map and rank using features such as plant community type and development stage, canopy cover, hydrography, soils, slope, aspect, and elevation.
 - Develop public awareness and an education outreach program that targets residents living in areas that have a high susceptibility to wildfires and make them aware of proactive steps that they can take to mitigate wildfire damage.
 - Implement a Firewise Medal Community Program that involves community fire preparation, evaluation, and awards for program involvement. The City shall seek recognition of this program by the state Firewise Communities Recognition Program.
 - Land uses and specific development plans for which adequate wildfire mitigation cannot be provided or that would preclude or severely limit the use of wildfire mitigation or natural resource management options such as prescribed fire shall not be authorized in severe wildfire hazard areas.
 - All new development shall complete and implement a wildfire mitigation plan specific to that development, subject to review and approval by the City Fire & Rescue Department, which shall be incorporated as part of the development plan approved for that development.
 - Structures shall be designed to minimize the potential for loss of life and property from wildfires, through requirements for outdoor sprinkler systems, fire-resistant building materials or treatments, landscaping with appropriate vegetation species, and site design practices.
 - Water storage facilities, accessible by standard firefighting equipment, shall be provided, dedicated, or identified for fighting wildfires. Where public supply is available, fire hydrants of sufficient pressure shall be required.
 - Streets, roads, driveways, bridges, culverts, and cul-de-sacs shall be designed to assure access by firefighting equipment, providing for weight class, cornering, turnaround, and overhead clearance.
 - The City shall implement a fuels management program that consists of the following:
 - Practices such as prescribed burning, mechanical fuel reduction, and thinning, as necessary and appropriate to reduce wildfire hazards consistent with natural resources protection.

- Increased public awareness of the benefits of prescribed burning and the inevitability of resulting smoke.

There are other policies that are considered best management practices for hazard mitigation that could be considered by the City as they update their Comprehensive Plan. The final draft of this profile will include more of these options.

7. Sources

New Smyrna Beach. 1995. *New Smyrna Beach Comprehensive Plan*.

Volusia County. 2002. *Volusia County Comprehensive Plan*.

Volusia County. 2005. *Local Mitigation Strategy*.

Florida Department of Community Affairs. 2004. *Statewide Emergency Shelter Plan*. Tallahassee, FL.

Florida Department of Community Affairs. 2005a. *Mapping for Emergency Management, Parallel Hazard Information System*. Tallahassee, FL.
<http://lmsmaps.methaz.org/lmsmaps/index.html>.

Florida Department of Community Affairs. 2005b. *Protecting Florida's Communities: Land Use Planning Strategies and Best Development Practices for Minimizing Vulnerability to Flooding and Coastal Storms*. Tallahassee, FL.

University of Florida, Bureau of Economic and Business Research. 2004. *Florida Statistical Abstract*. Gainesville, FL.

U.S. Census Bureau. 2000. *State & County Quickfacts*. Retrieved in 2005 from <http://quickfacts.census.gov/qfd/index.html>.

Attachment A

**Maps of the Existing and Future Land Uses within the
Coastal Hazard Zone and the Hurricane Vulnerability Zone**

Attachment B

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

Attachment C

**Maps of the Existing and Future Land Uses
within the High-Risk Wildfire Zone**

Attachment D

**Maps of the Existing and Future Land Uses
within the High-Risk Sinkhole Zones**

Attachment E

Volusia County Comprehensive Plan Excerpts Related to Hazard Mitigation

Capital Improvements Element

OBJECTIVE:

15.1.2 Public expenditures shall be prohibited that will encourage new development in the Coastal High Hazard Area, unless the expenditure is consistent with policies specifically identified in the Coastal Management Element or cross-referenced to another appropriate element and included in the Capital Improvements Element. The prohibition does not include: expenditures associated with redevelopment or development of properties in accordance with previously approved subdivisions or site plans; public access and recreation facilities or resource restoration projects/facilities.

POLICIES:

15.1.2.1 Prior to development of public facilities in the Coastal High Hazard Area, it shall be determined that there are no other feasible sites in that area.

15.1.2.2 If feasible and where state funds are available, County infrastructure within the Coastal High Hazard Area shall be relocated outside of said area when repairing and replacing the infrastructure. If relocation is not deemed feasible by the County, any repair or renovation requiring state funding shall be done to minimize potential storm or flooding damage.

15.1.2.3 The County will adopt and implement a mitigation plan to reduce damages in areas of repetitive loss due to flooding and comply with FEMA requirements.

15.1.2.4 Prior to 2000, a hazard identification study and vulnerability assessment study of the unincorporated portions of the Hurricane Vulnerability Zone and Coastal High Hazard Area shall be undertaken. After these studies are completed, Capital Improvements programming and land development regulations shall be adopted or revised, to establish a continuing program of hurricane mitigation.

15.1.3.1 All development of public facilities in the Hurricane Vulnerability Zone shall be consistent with federal flood hazard requirements.

15.1.3.2 Public facilities shall be limited within the 100 year flood plain or in flood prone areas. Any public facilities that are built will be consistent with the County's Land Development regulations and shall be flood-proofed to minimize damage from floods, storms, and hurricanes.

15.2.1.2 Individual Capital Improvement projects shall be evaluated and ranked in priority based on the following order of criteria with (a) being the highest priority: a. whether an individual project is needed to protect the community from an immediate threat to its public health, safety, and welfare; such projects shall be of an emergency nature.

Coastal Managements Element

GOAL:

11.1 Conserve, protect, and manage the coastal resources of Volusia County including the wetland and upland ecosystem so as to maintain and enhance native habitats, floral and faunal species diversity, water quality, and natural surface water characteristics.

OBJECTIVE:

11.1.1 Maintain management programs to ensure the long-term protection and enhancement of wetland habitats, water quality, and selected natural upland habitats. The primary means of accomplishing this objective will be through the retention of interconnected hydroecological systems where the wetlands and uplands function as a productive unit resembling the original landscape.

11.1.1.1 The Volusia County Environmental Management Services Group in connection with the Environmental and Natural Resources Advisory Committee will be responsible for developing management plans and standards that protect and conserve natural systems within the coastal area.

11.1.1.4 Areas of critical wetland and native upland habitats not connected to corridors that exhibit resource values should be evaluated for inclusion as conservation or recreation areas within future development plans. Secondary linkage to nearby corridors, even if by artificial means, should be considered and encouraged. Construction of new corridors or linkages should be considered as a form of mitigation where appropriate.

11.1.1.5 The Growth Management and Environmental Management Services Center shall continue to implement conservation, management, and development review standards of the development review process. Such reviews are intended to minimize long-term and cumulative impacts on coastal habitat by requiring site specific analysis during the review process.

11.1.1.8 Manage spoil islands so that they may become an integral component of lagoon ecology.

11.1.1.9 The Environmental Management Services Group will maintain standards for wetland habitat mitigation. These standards identify situations where mitigation may be acceptable (e.g., non-forested wetland or mangrove swamp creation), unacceptable (e.g., certain endangered species habitat such as an eagle nest), or problematic (e.g., experimental or unproven). In all cases the proposed mitigation plan should be designed and the project monitored by a qualified professional. The mitigation plan should include the following:

- A A statement of mitigation goals and objectives.
- B Watershed and adjacent habitat evaluation.
- C Geohydrological analysis.
- D Detailed construction plans, planting and maintenance schedules.
- E A long term management plan for the created wetland habitat in the watershed in which it is located (inappropriate future land uses surrounding the created or enhanced wetland habitat may alter the habitat's character or eliminate it completely).
- F The removal or control of exotic or nuisance vegetation.
- G Monitoring methodology to evaluate the degree of success obtained.
- H Proper contracted supervision by a qualified expert.
- I A detailed budget and cost estimates.
- J The entity responsible for undertaking maintenance and a long-term management plan with available funding required to ensure future success.

11.1.1.11 In conjunction with any future County land acquisition program, the Growth Management and Environmental Management Services Center will prepare prioritized listings of habitats and properties for future public acquisition. The criteria used for determining priorities will include, but not be limited to:

- A Rarity of habitat in corridor or watershed.
- B Utilization of habitat/property by wildlife, particularly protected species (fauna and flora).
- C Strategic location in corridor or along shoreline.
- D Groundwater recharge area.
- E Surface water storage area.
- F Recreation value (i.e., canoeing, fishing, hunting, swimming, nature study, hiking, and camping).
- G Funding sources and inter-agency joint acquisition programs.
- H Private inholdings within existing public conservation lands.

11.1.1.12 The Environmental Management Services Group will continue to support and sponsor estuarine, oceanfront, and shoreline habitat reclamation. Projects will target identified shore lines where reclamation is required to offset impacts from existing upland development including stormwater discharges, bulk heading, dumping and land clearing. Reclamation will include but not be limited to:

- A Removing debris and toxic materials.
- B Stabilizing shorelines.
- C Creating wetland habitat such as mangrove and salt marsh.
- D Dune restoration.
- E Relocating or eliminating storm water/domestic waste and effluent.
- F Maintenance of stormwater facilities and retrofitting where needed.
- G Regulation of urban shoreline redevelopment.

11.1.1.16 Development adjacent to estuarine and riverine shoreline areas shall maintain a habitat buffer zone to protect or conserve the canopy, understory and ground cover of native upland vegetation and wetlands.

11.2.1.3 Designated natural resource areas, significant environmental or ecological features, critical wildlife habitat, environmental system corridors or conservation areas shall be protected through a variety of mechanisms including buffer zones, restoration, limiting density and intensity, conservation easements, acquisition, density transfers, transfer of development rights (TDRs), purchase of development rights or land exchanges.

11.2.1.4 The priority for new development shall be in areas of urban infill in order to contain sprawl, use existing developable lands, maximize the provision of urban services and facilities and protect remaining coastal habitat.

11.2.2.1 Volusia County has rezoned the unincorporated Coastal area consistent with the protection or conservation of coastal resources.

11.2.2.2 Utilize innovative or alternative zoning districts or techniques to protect coastal resources. Such techniques could include overlay districts, floating zones, bonus ordinances, performance standards, fast-tracking of development applications, quality development programs, Transferable Development Rights, or other incentive-based methods.

11.2.4.9 Redevelopment activity shall not result in increasing hurricane evacuation times above the clearance time identified in this Element.

11.2.4.10 Redevelopment should be viewed as an opportunity to restore beach and dune systems, improve visual appearance, incorporate landscaping and buffer areas, improve traffic circulation, and upgrade stormwater management systems.

GOAL:

11.4 Protect, enhance, and restore the functioning of the beach and dune systems and prohibit development activities that would damage or destroy such systems.

OBJECTIVE:

11.4.1 Maintain standards to minimize the impacts of structures and development on beach and dune systems and where necessary initiate dune restoration programs.

11.4.1.1 Continue to coordinate with the Florida Division of Beaches and Shores concerning the Coastal Construction Control Line (CCCL) to implement the following criteria.

- A For non-seawalled open-ocean coast, the CCCL should be located behind the landward base of the foredune ridge. The foredune ridge should be allowed to expand landward. A buffer between the landward base of the foredune ridge and building construction should be established.
- B For seawalled coast, the CCCL should be drawn behind the bulkhead line in accordance with the 100-year storm surge.

11.4.1.2 Volusia County has amended the Zoning maps to depict the reestablished CCCL.

11.4.1.3 New seawalls shall only be allowed in an emergency situation to protect health, safety, principal buildings, public infrastructure, or to fill in small gaps (size of gaps will be consistent with FDEP definition of a gap) between existing seawalls. The construction of new seawalls shall be consistent with Policies 11.4.1.5, 11.4.1.6, and 11.4.1.7. Also, new seawalls must be permitted by the County and the Florida Department of Environmental Protection.

11.4.1.4 Reconstruction or replacement of existing hard erosion control structures along the oceanfront shall be consistent with Policies 11.4.1.5, 11.4.1.6, and 11.4.1.7; except for the maintenance and care of public navigational structures such as Ponce DeLeon Inlet, structures which are needed to protect evacuation routes, public facilities, and public utilities. Also, such seawalls shall be permitted by the County and the DEP.

11.4.1.5 Seawall construction in the County shall be consistent with State requirements and should be of a low profile design that relates to local beach conditions. In addition, all new seawalls shall be designed and constructed to minimize adverse effects to adjacent properties.

11.4.1.6 A dune system shall be developed and vegetated with suitable materials to bury all new, and/or reconstruction or replacement seawalls within the County.

11.4.1.7 Dune systems created to bury seawalls shall be maintained to emulate natural dune systems and to prevent seawalls from being exposed. If a dune system created to bury a wall is eroded resulting in a seawall being exposed, the dune system shall be reconstructed to bury the wall and repair dune damage. All dune reconstruction or maintenance shall be done following the end of, and prior to the beginning of the marine sea turtle nesting season.

11.4.1.8 Volusia County shall maintain standards for the maintenance and restoration of dune areas.

11.4.1.9 Coastal construction shall be planned, designed, and constructed to avoid the man-made destruction or removal of existing dunes and dune vegetation. Where such impacts cannot be avoided, such impacts shall be mitigated.

11.4.1.10 Structural development along beaches fronting the Atlantic Ocean shall enhance and not further degrade the coastal beach and dune system. The following criteria shall apply in the implementation of this policy:

- A Shoreline buffer zones shall be established to protect and preserve the coastal beach and dune systems fronting the Atlantic Ocean.
- B Structures shall be prohibited within the established buffer areas except where overriding public interest is apparent for public park and recreation facilities, or for structures that are necessary for reasonable access and are elevated above the dune vegetation.
- C Buffer areas shall be measured seaward from the existing or historical vegetative line and established after adoption of the new Coastal Construction Control Line.

11.4.1.11 Beach and dune management plans have been prepared that assess temporal and spatial long shore transport rates and direction, rates of on-shore sand movement, rates of dune build-up, wave focusing, and off-shore topography refracting waves, the rate at which Ponce DeLeon Inlet is ingesting sand, and the effects of mechanical devices such as sand cleaning machines. The subject plans will be utilized to manage applicable coastal management issues.

11.4.1.12 Maintain expertise in coastal geology/engineering to design research projects and to conduct field and lab work to complete these projects.

11.4.1.13 As part of the coastal resource function, exchange information and monitor data collection of the Florida Department of Environmental Protection, the US Army Corps of Engineer, Florida Sea Grant College, universities, and other appropriate agencies.

11.4.1.14 In cooperation with the FDEP, develop information and education programs to inform citizens on how the coastline works. Provide technical assistance to land owners, citizens, community interest groups, and local governments.

11.4.1.15 Utilize State and Federal grants and community resources to implement beach and dune restoration projects such as civic associations, community groups, "Adopt-ADune" programs, private donations, or other similar techniques.

11.4.1.16 The County has conducted a successful dune restoration demonstration project in the Wilbur-by-the-Sea Community. The subject dune restoration project shall serve as an example of appropriate dune restoration.

11.4.1.17 Incorporate dune restoration projects and revegetation into public improvement projects such as park, recreation facilities, and off-beach parking on or adjacent to the beach.

11.4.1.18 Prepare interlocal agreements with coastal municipalities and the State of Florida for the funding and development of beach maintenance and restoration programs and projects.

11.4.1.19 The stabilization and depth maintenance of Ponce DeLeon Inlet and the longshore transport of sediment relations to the Inlet zone of influence shall continue to be managed under the FDEP certified Inlet Management Plan.

11.4.1.20 Sands dredged from the Ponce DeLeon Inlet should be used to stem beach erosion within the zone of influence. All sand dredged from Ponce DeLeon Inlet shall be managed in accordance with the FDEP certified Ponce DeLeon Inlet Management Plan.

11.4.1.21 Volusia County should continue to monitor sea level rise science to determine when and if a sea level rise event will affect the County. Based on pertinent data, the County will act accordingly.

GOAL:

11.5 Lessen the impact of a destructive storm on human life, property, public facilities, and natural resources by discouraging the location of new development in the coastal high hazard area through limitations to new public expenditures in these areas.

OBJECTIVE:

11.5.1 Evacuation of Population. Maintain the clearance time of the population in the Hurricane Vulnerability Zone at nineteen (19) hours based on a level of service standard "D."

POLICIES:

11.5.1.1 Land use plan amendments in the Hurricane Vulnerability Zone shall strive to reduce and shall not increase the clearance time in the Hurricane Vulnerability Zone above 19 hours.

11.5.1.2 Assess the impact of new development on hurricane evacuation network to ensure it will not increase clearance time of the population in the Hurricane Vulnerability Zone above 19 hours.

11.5.1.3 Ensure adequate roadway capacity to facilitate the evacuation of residents in the Hurricane Vulnerability Zone. The County, in conjunction with the coastal cities, the Metropolitan Planning Organization, and/or Florida Department of Transportation (as appropriate), shall seek to mitigate issues associated with the critical roadway segments for evacuation routes, as identified in the "East Central Florida Hurricane Study, update 1999" so as to maintain an acceptable clearance time.

11.5.1.4 Future roadway improvements shall minimize the impact of flooding and storm damage on evacuation route facilities.

11.5.1.5 Evacuation routes shall be designated in such a way as to distribute traffic demand to provide optimum utilization of available roadway facilities.

11.5.1.6 Volusia County shall coordinate the Peacetime Emergency Plan with the Coastal Cities to ensure the orderly evacuation of the population in the Hurricane Vulnerability Zone.

OBJECTIVE:

11.5.2 Shelter for Population. In cooperation with the American Red Cross, Volusia County shall designate hurricane evacuation shelters to protect the population in the Hurricane Vulnerability Zone.

POLICIES:

11.5.2.1 Volusia County in cooperation with the American Red Cross shall designate hurricane emergency shelter facilities to accommodate at least 10% of the population in the Hurricane Vulnerability Zone, based upon a standard of 20 square feet of shelter space per person.

11.5.2.2 New hurricane emergency shelter space shall not be located in the Hurricane Vulnerability Zone.

OBJECTIVE:

11.5.3 Mitigation of Property Damage. Ensure that development in the Hurricane Vulnerability one and Coastal High Hazard Area minimizes danger to life and property.

11.5.3.1 Public facilities shall be prohibited that will encourage new development inside the Coastal High Hazard Area, unless the facilities are consistent with policies specifically identified in the Coastal Management Element or cross-referenced to another appropriate element and included in the Capital Improvements Element. This prohibition does not include: facilities associated with redevelopment or development of properties in accordance with previously approved subdivisions or site plans; public access and recreation facilities; facilities necessary for public health/safety/welfare; or resource restoration projects/facilities.

11.5.3.2 Prior to the development of public facilities in the Coastal High Hazard Area, it shall be determined that there are no other feasible sites outside that area.

11.5.3.3 If constructed, all public facilities in the Coastal High Hazard Area shall be flood proofed to ensure minimum damages from storms and hurricanes.

11.5.3.4 The County shall enforce, where necessary and appropriate, regulations that provide for: dune protection and stabilization, flood proofing of utilities, and requirements for structural wind resistance and flood plain management.

11.5.3.5 All development in the Hurricane Vulnerability Zone shall be consistent with the federal flood hazard requirements.

11.5.3.6 The County shall continue to participate in the National Flood Insurance Program (NFIP).

11.5.3.8 If feasible, and where State funds are anticipated to be needed, County-owned infrastructure presently within the Coastal High Hazard Area shall be relocated outside of said area when repairing/replacing the infrastructure. If relocation of the infrastructure is deemed by the County to not be feasible, any reconstruction or repair of the infrastructure necessitating State funds shall be designed so as to minimize potential damage (i.e., wind and/or flooding) from hurricanes or other storms.

11.5.3.9 The County, in accordance with Federal Emergency Management Agency requirements, will adopt and implement a mitigation plan to reduce damage in areas of repetitive loss due to flooding.

11.5.3.10 A "Local Mitigation Strategy" (LMS) has been prepared by the County's Emergency Management Services. The LMS is resultant of a county-wide multi-jurisdictional program (Volusia 2020). The County shall, as practical, continue participation in this program and implement the LMS, as necessary and appropriate, through capital improvements programming and land development regulations to establish a continuing program of hurricane mitigation.

11.5.3.11 The County shall continue to direct growth away from the CHHA by utilizing land use controls, acquisition techniques, and other methods as deemed appropriate.

OBJECTIVE:

11.5.4 Post Disaster Redevelopment. Prior to 2000, Volusia County with the East Central Florida Regional Planning Council, and the coastal cities, as appropriate, shall undertake an evaluation of the long-term problems related to post-disaster redevelopment and based upon those findings prepare a Post-Disaster Redevelopment Plan. If necessary, amendments shall be made to the Comprehensive Plan based upon the Post-Disaster Redevelopment Plan.

POLICIES:

11.5.4.1 The Post-Disaster Redevelopment Plan shall include, but is not limited to: the identification of land areas that should not be reconstructed, limiting redevelopment in

documented areas of repetitive loss, abandonment and/or relocation of buildings, rebuilding of public facilities, reconstruction with structural modification and distinguishing between immediate repair/cleanup actions, and actions needed to protect public health and safety, and long-term repair and redevelopment.

11.5.4.2 The Post-Disaster Redevelopment Plan shall also identify structures in the Coastal High Hazard Area that might be of some utility for public access to coastal beaches and waterways, and make recommendations for acquisition when post-disaster opportunities arise. It shall establish guidelines for determining priorities for the acquisition of storm-damaged property in the Coastal High Hazard Area and Hurricane Vulnerability Zone.

11.5.4.3 The Post-Disaster Redevelopment Plan shall establish principles for repairing, replacing, modifying, or relocating public facilities in the Coastal High Hazard Area and Hurricane Vulnerability Zone.

11.5.4.4 As provided for by the land development regulations, the following post-disaster reconstruction policy is to be applied after a hurricane. For other disasters, refer to Policy 1.1.2.2 (Future Land Use Element).

- A Structures damaged less than 50% of their replacement cost at the time of damage may be rebuilt to their original condition, subject only to current building and life-safety codes.
- B Structures damaged more than 50% of their replacement cost at the time of damage can be rebuilt to their original square footage and density, provided that they comply with:
 - 1. Requirements of the County's land development regulations for elevation above the 100-year flood level;
 - 2. Building code requirements for flood proofing (non-residential);
 - 3. Current building and life-safety codes (at the time of building permit application);
 - 4. State Coastal Construction Control Line Regulations; and
 - 5. Any required zoning or other development regulations (other than density or intensity), unless compliance with such regulations would preclude reconstruction otherwise intended by the post-disaster reconstruction policy.
- C The land development regulations may establish procedures to document actual uses, densities, and intensities, and compliance with regulations in effect at the time of construction, through such means as photographs, diagrams, plans, affidavits, permits, appraisals, and tax rewards.

11.5.4.5 The Volusia County Comprehensive Emergency Management Plan for post-disaster recovery provides for immediate repair and clean up actions in the form of disaster assessment, the provision of temporary housing, and individual assistance. These efforts shall be coordinated between Volusia County and the Coastal Cities. Reconstruction shall be consistent with the Recovery Annex of the Comprehensive Emergency Management Plan, as appropriate, until such time as the Post-Disaster Redevelopment Plan has been adopted.

11.6.1.4 The priority for new pedestrian access shall be pedestrian walkovers or other alternatives that do not harm the dune system. Existing Unimproved Public Pathways and improved walkways should be converted to dune walkovers or eliminated in accordance with the County's Beach Management Plan.

OBJECTIVE:

11.7.7 Public Buildings. Ensure through capital improvement planning and site selection that public buildings meet the needs of population growth and are located outside of areas susceptible to damage from storms or flooding.

11.7.7.2 Encourage the School Board to locate future school facilities outside of areas susceptible to hurricane storm damage or areas prone to flooding, or as consistent with F.S. 235 and F.A.C. Rule 7A-2 regarding flood plain and school building requirements.

11.7.7.3 Cooperate with the School Board and the Red Cross in the identification and designation of school facilities as hurricane evacuation and emergency shelters.

11.7.7.4 Encourage the School Board to design future school facilities, as required to address existing and future needs, to be utilized as emergency and evacuation shelters.

11.7.7.5 Provide for fire and law enforcement facilities commensurate with population growth and development in the coastal area.

11.7.7.6 Locate new fire and law enforcement facilities outside of the areas susceptible to hurricane storm damage or flooding where feasible.

11.7.7.7 Continue to update procedures as part of the Peacetime Emergency Plan for emergency fire and police protection and response.

11.8.4.1 Seawall construction in the County shall be consistent with the State requirement mandating design and construction to withstand a 100-year storm event.

11.8.4.2 Volusia County and the coastal cities shall maintain uniform standards for the maintenance and restoration of dune areas.

11.8.4.3 The County and coastal cities shall prepare a beach and dune management plan except that the Ponce DeLeon Port Authority shall implement the beach and dune management practices set forth in the "Inlet Management Plan" which has been certified by the Florida Department of Environmental Protection (FDEP) between FDEP monuments R-130 to R-165.

OBJECTIVE:

11.8.5 Hurricane Evacuation. Volusia County and the coastal cities shall coordinate all hurricane evacuation activities through the Volusia County Emergency Management Services.

Conservation Element

12.1.1.5 The most current best management practices which control erosion and limit the amount of sediment reaching surface waters shall continue to be required and encouraged for construction, agriculture, silviculture, excavation, dredge and fill, and stormwater management activities.

OBJECTIVE:

12.1.2 To protect and enhance the natural hydrologic functions and wildlife habitat attributes of surface water resources, including estuarine and oceanic waters, as well as waters which flow into estuarine and oceanic water, and the floodplains associated with these waters.

12.1.2.1 Natural shoreline buffers or setbacks shall remain established for surface water bodies, the extent of which will depend on, at minimum: existing soils; cover and type of vegetation; topography; wildlife habitat; ambient water quality; and the protective status of the water body.

12.1.2.4 Vertical seawalls and bulkheads along the banks and shorelines of naturally occurring surface water bodies shall continue to be limited to those instances where serious threat to life or property can be demonstrated. In such cases, utilization of sloping stabilization methods

combined with vegetation shall be used as an alternative to vertical seawalls and bulkheads where feasible.

12.1.2.7 Undisturbed segments of flood plains associated with surface water bodies shall continue to be protected through public acquisition, land use controls, conservation easements, or other methods as appropriate.

12.1.2.8 Proposed structures located within the flood plain of surface water bodies and within flood prone areas, shall continue to be required to utilize building methods as provided in land development regulations, to the extent that fill material required for construction or other impervious surfaces will not reduce the ability of the floodplains to store and convey floodwaters, or degrade the natural physical and biological functions of protected habitat without approved mitigation. Impacts of fill in the floodplains and floodprone areas shall be considered both site specifically and cumulatively.

12.1.2.9 Dwelling unit densities shall continue to be limited within the flood plains of surface water bodies and in other flood prone areas as provided for in land development regulations, in that allowable densities do not create potential flood hazards, or degrade the natural functions of the flood plain. Dwelling unit density determinations in the floodplain shall consider both site specific and cumulative impacts.

OBJECTIVE:

12.2.3 To eliminate any net loss of wetlands and prevent the functional values of such wetlands. to be degraded as a result of land development decisions.

POLICIES:

12.2.3.1 Coastal and riverine wetlands shall be preserved wherever possible. In cases where adverse impacts to such wetlands are found by the County to be necessary to the overriding public interest, appropriate mitigation as specified in Policy 12.2.3.5 shall be required. In those instances where coastal and riverine wetlands are found to be functionally degraded, restoration of such wetlands may be considered as appropriate mitigation.

12.2.3.2 Proposed activities within the NRMA (Policy 12.2.1.1) shall avoid adverse impacts to wetlands and their associated natural physical and biological functions, except in cases where it can be demonstrated to be in the overriding public interest. In such cases, appropriate mitigation as outlined in Policy 12.2.3.5 shall be required. Wetlands which are shown to be functionally degraded shall be targeted for restoration.

12.2.3.4 Natural Buffer Zones or setbacks shall be required landward of all protected wetlands occurring in unincorporated Volusia County.

- A Natural Buffer Zones for wetlands occurring within the NRMA shall be determined on an individual basis with standards and formulas derived for the following criteria, at minimum: existing soil erodibility; cover and type of vegetation; slope; watertable depths; water quality; wildlife; and the protective status of the receiving waters. Natural buffer zones shall consist of intact natural communities comprised predominantly of appropriate native vegetative species in the overstory, shrub, and understory layers. Activities within the Natural Buffer Zone shall be limited to those which are shown to be consistent with the intended use of this zone while providing for reasonable access to water bodies.
- B Proposed activities adjacent to isolated wetlands occurring outside the NRMA shall have yard setbacks or natural buffers measured from the upland/wetland interface, as determined by vegetative dominance. Wetlands which are hydrologically

connected to a surface water body, and not located within the NRMA, shall require a natural buffer zone consistent with the standards provided in Subsection (a).

- C In cases where the alteration of the Natural Buffer Zone is determined to be unavoidable, appropriate mitigation shall be required.
- D For land development proposals subject to the St. Johns River Water Management District Environmental Resource permit process, the secondary impact requirement (pursuant to Section 12.2.7 of the MSSW Handbook) shall satisfy the intent of this policy.

12.2.3.7 The dwelling unit density standard for wetlands in determining overall project densities for the purposes of clustering units shall be one unit per 10 acres of wetland, with the exception of the Forestry and Environmental Systems Corridor special use categories (see Policy 12.2.1.2.) which shall correspond to the minimum lot size for those categories.

OBJECTIVE:

12.2.4 To protect habitats of wildlife species occurring in the County, particularly those which are threatened, endangered, or of special concern, to maintain, and enhance where necessary, existing species population numbers and distributions.

12.2.4.4 Where feasible, the County shall protect critical habitat through acquisition, establishment of public or private conservation easements, purchase of development rights, or through other available means as deemed appropriate.

12.2.4.7 The County shall protect the natural resource values, particularly those relating to wildlife habitat and aquifer recharge of Rima Ridge through public and/or private easements, public acquisition, land use regulations, or other methods deemed appropriate.

OBJECTIVE:

12.4.2 To incorporate the inherent limitation of existing soils in land planning and development, and minimize impacts which result in soil erosion.

12.4.2.3 Silvicultural and agricultural activities shall utilize the most current Best Management Practices to prevent soil erosion and subsequent siltation of surface water bodies.

Future Land Use Element

1.1.2.1 New development in the coastal area shall be managed so that public facility and service needs required to maintain existing hurricane evacuation times do not exceed the ability of Volusia County to provide them.

1.1.2.2 The following is Volusia County's post-disaster reconstruction policy, to be applied after a natural disaster:

- A Structures damaged less than 50% of their replacement cost at the time of damage may be rebuilt to their original condition, subject only to current building and life-safety codes.
- B Structures damaged more than 50% of their replacement cost at the time of damage can be rebuilt to their original square footage and density, provided that they comply with:
 - 1. Federal requirements for elevation above the 100-year flood level;
 - 2. Building code requirements for flood proofing;
 - 3. Current building and life-safety codes (at the time of building permit application);
 - 4. State Coastal Construction Control Lines; and

- 5. Any required zoning or other development regulations (other than density or intensity), unless compliance with such regulations would preclude reconstruction otherwise intended by the post-disaster reconstruction policy.
- C The land development regulations may establish procedures to document actual uses, densities, and intensities, and compliance with regulations in effect at the time of construction, through such means as photographs, diagrams, plans, affidavits, permits, appraisals, and tax.

1.2.1.1 The location of development and significance of topography, vegetation, wildlife habitat, flood hazard, the 100 year flood plain, and soils for a particular site will be determined during the development review.

1.2.1.7 New urban developments shall be encouraged to adhere to the fire safety standards outlined in the Florida Division of Forestry publication, "Protecting Florida Homes from Wildfire." These standards can significantly reduce the disastrous loss of life, property and resources resulting from wildfire in wildland/urban interface fire hazard.

1.2.2.1 Development within areas prone to 100 year flooding shall not increase expected flood levels for adjacent properties or reduce receiving surface water body quality below established.

1.2.2.3 Volusia County's regulations for the protection of groundwater aquifer recharge areas shall be consistent with the criteria contained in the Natural Groundwater and Aquifer Recharge and Conservation Element.

1.2.2.8 Structures shall be discouraged within the 100-year flood plain; however, if located therein, they shall be constructed to minimize the amount of additional fill, thereby reducing the potential for flood damage to the structure, supporting facilities, and adjacent property, consistent with the Flood Hazard Management section of the Land Development Code.

1.2.2.13 Agriculture and silviculture operations shall adhere to accepted Best Management Practices (BMP's) for surface water management and erosion control.

1.2.3.1 An environmental buffer shall be utilized to protect the functional abilities of the shores of lakes, rivers, streams, and upland extent of wetlands. The extent of the buffer will be determined by the location of the shoreline as described in the Conservation Element.

1.2.3.8 Volusia County shall encourage cluster developments to preserve environmentally sensitive land and other open space areas, but not to increase density above the existing land use category.

INDUSTRIAL:

- 1. be located with all structures outside of the 100 year flood plain;

Aquifer Recharge Element

GOAL:

10.1 Protect the quality and quantity of the surficial and Floridan aquifers, including the Volusia-Floridan sole source aquifer, and protect and enhance the capabilities of the groundwater recharge areas for the present and future water supply of the County.

10.1.1.8 The criteria for evaluating the condition of the aquifer for this and all policies in this Subelement may include, but not be limited to: saltwater intrusion; changes in vegetation, springs and wetlands; increase occurrence of sinkholes and peat fires; evidence of potential groundwater

contamination; and evidence of the compaction of the soils overlying the aquifer due to a change in the water levels.

10.1.1.11 Prime (or high) aquifer recharge areas appropriate for development shall be developed so as to continue to maintain pre-development net retention, exempting agricultural activities utilizing those Best Management Practices adopted by USDA NRCS and FDEP which in fact protect ground and surface water quality. New stormwater management projects in existing developed areas should be designed in a fashion that provides for aquifer recharge.

10.1.2.13 Future landfills shall not be located within prime (or high) aquifer recharge areas or karst areas prone to sinkhole activity.

10.1.3.2 Volusia County, working with the SJRWMD and the Volusian Water Alliance, shall:

- A Restrict additional groundwater development within those portions of coastal Volusia County which are known to contain groundwater of subpotable quality at a depth of less than 100 feet.
- B Permit regional wellfields under their jurisdiction to serve a multipurpose function, such as conservation and passive public recreational facilities.
- C Monitor that the natural aquifer levels are maintained.
- D Encourage water use efficiency through low flow plumbing, water efficient landscaping, etc. If necessary, explore alternative sources of potable water.

Recreation and Open Space Element

13.2.1.2 Utilize innovative techniques to protect identified open space areas. Such techniques could include overlay districts, flood zones, performance standards, or other incentive based methods.

13.2.1.3 Designated open space areas encompassing natural resource areas, significant environmental features, wildlife habitats, conservation or potential recreation areas shall be protected, but not limited to, buffer zones, deed restrictions, limiting density and intensity of development, conservation easements, acquisition, transfer of development rights, and purchase of development rights or land exchanges.

Potable Water Element

7.1.1.3 Volusia County shall require the construction of facilities for providing a minimum fire flow as a condition of development approval. Applicable fire flow rates for individual land uses shall be required as provided for by the Land Development Code.

7.1.6.3 Volusia County shall develop strategies, as needed, to balance fluctuation in water demand, safeguard continuance of supply in case of plant or water main breakdown, and to provide required fire flow.

Attachment F**New Smyrna Beach Comprehensive Plan Excerpts Related to Hazard Mitigation****FUTURE LAND USE ELEMENT****POLICIES:**

- 1.h. Enforce specific regulations in the Land Development Regulations which address the development of property located in areas subject to seasonal or periodic flooding.
- 2.d. Maintain citywide densities, which, will ensure that beachside residents can be evacuated consistent with the Hurricane Evacuation Plan.
- 6.a. The city will provide for the protection of environmentally sensitive lands and protection of their natural functions through the maintenance and enforcement of the City of New Smyrna Beach Land Development Regulations.
- 6.b. On a parcel-by-parcel basis, prepare an environmental assessment of the conservation resources and determine specific designations for areas of environmental concern. Once the environmental-protection areas, including any associated uplands are determined by a qualified biologist or natural scientist, the conservation limits shall be mapped by a registered land surveyor.
- 6.d. Circumstances under which location by the City of a conservation boundary line will require a Future Land Use Map amendment.
- 6.e. Maintain and enforce appropriate development regulations, which protect conservation areas.
- 6.h. Implement policies detailed in the Conservation Element that provide incentives for the protection and enhancement of natural resources, such as beaches, wetlands and trees through the adoption of land development regulations, a tree protection ordinance, a stormwater management ordinance and a minimum wetlands standards ordinance.
- 6.i. Implement policies detailed in the Coastal Management Element, which maintain, restore and enhance the overall quality of the coastal zone environment. These policies should be implemented in coordination with the city's land development regulations and an effective concurrency management program, as well as with redevelopment of areas within the Community Redevelopment Area.
- 6.j. Maintain and enforce wetlands protection adopted in the land development regulations.

- 7.g.8 Stormwater management design is to meet a 100-year three-day storm as the minimum design standard.
- 7.l. Future growth areas of the city within the boundaries identified by the Water and Sewer Service Area Agreement will be used to redirect major public developments, health facilities, commercial activity centers and manufacturing away from coastal high-hazard areas through land development regulations, interlocal agreements and statutorily regulated annexations.
- 8.a. Utilize cluster development zoning to allow for mixed uses and unconventional development designs in those cases where the developer can demonstrate improved living environments, protection of natural resources, or increased efficiency of service delivery.
- 14.a. No new public schools shall be located in the aforementioned land use categories on the beachside or in Coastal High Hazard Areas on the mainland.

Traffic Circulation

OBJECTIVE 7

To adopt by 1995 a roadway plan and evacuation routes which provide for safe and efficient evacuation of the population in emergency situations.

Housing

POLICY 2.d

Carefully monitor and enforce the development approval process to ensure that negative environmental impacts of new housing are minimal, and that new housing developments are not constructed in wetlands, aquifer recharge areas, or areas known to be habitat for threatened or endangered species, without proper mitigation.

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

GOALS

Potable Water

POLICIES:

- 1.a. Continue to operate and maintain the Glencoe and Samsula wellfields to meet average-day and peak-day demands and established fire flow requirements.
- 1.b. Continue to operate and maintain the Glencoe Road Water Treatment Plant to meet average-day and peak-day demands and established fire flow requirements, and to maintain satisfactory water pressure. Also continue to provide a level of treatment that complies with state and federal safe drinking water standards.

- 1.d. Continue to operate and maintain water storage facilities to provide adequate capacity for meeting peak-day demands and fire flow requirements.
- 1.f. Make water distribution system improvements to the extent possible to allow the water service area to maintain current ISO (Insurance Service Organization) fire ratings.

OBJECTIVE 3

To coordinate extension of, or increase the capacity of, potable water facilities to meet future average-day, peak-day and fire flow demands/requirements without contributing to urban sprawl, in compliance with the adopted Interlocal Service Area Agreement and the Future Land Use Element.

Drainage

POLICIES:

- 1.a. Maintain existing, and develop new, minor drainage systems for handling runoff from frequently occurring (2-, 5- and 10-year) storm events, consistent with the Future Land Use Element.
- 1.b. Maintain existing, and develop new, drainage systems and regulated floodways for handling seldom occurring (25- and 50-year storm events).
- 1.c. Ensure that all stormwater management and drainage facilities comply with existing city, state and federal stormwater management ordinances and regulations.
- 1.d. Ensure that all new detention facilities are designed to handle the minimum stormwater requirements described in the city's storm-water ordinance.
- 1.e. Regulate land uses and require design of drainage systems and developments to reduce non-point pollution and protect the function of natural groundwater recharge areas and natural drainage features. The following actions shall be required to reduce non-point pollution:
 - Use pervious materials to reduce the amount of impervious areas.
- 1.f. Acquire property or easements to ensure continued proper maintenance of system wide drainage facilities located on privately owned lands.
- 1.i. Require property owners to maintain stormwater management systems in accordance with the city's stormwater management requirements.

- 3.c. Require all new development and redevelopment to meet the performance and design standards of the city's Stormwater Management and Conservation Ordinance No. 97-89, Section 11.5-27, unless specifically exempted by Section 11.5-2.b. or until such time as amended or replaced as a result of completion of policy 3.a. above.

NATURAL GROUNDWATER AQUIFER RECHARGE ELEMENT

OBJECTIVE 1 To continue to implement city regulations and programs to protect the function of natural groundwater recharge areas.

POLICIES:

- 1.c. Regulate the amount of impervious surface allowed on a lot.
- 1.d. Allow pervious materials to be used in parking lot and other surface-covering construction.

COSTAL MANAGEMENT ELEMENT

Coastal Resources

OBJECTIVE 1 Prior to 1991, New Smyrna Beach will review and adopt management programs to ensure the long-term protection and enhancement of selected natural upland and wetland habitats and water quality. The primary means of accomplishing this objective will be through the retention of interconnected hydro ecological systems where the wetlands and uplands function as a productive unit resembling the original landscape.

POLICIES:

- 1.a. The Volusia County Environmental Management Department (EMD), in connection with the Environmental and Natural Resources Advisory Committee, will be responsible for developing management plans and standards that protect and conserve natural systems within the coastal area. From these plans and standards, New Smyrna Beach will review and adopt the ones that are appropriate for the city.
- 1.c. New Smyrna Beach will prepare development review standards to be incorporated into the development review process, which will minimize long-term and cumulative impacts on coastal habitat by requiring site-specific analysis during the review process.
- The removal or control of exotic or nuisance vegetation.
- 1.e. The County Charter provisions relating to the beach provide the sole authority and responsibility of all beach regulations, beach operations, beach access and beach maintenance to the County of Volusia. The City is preempted on all matters, except licensing, by the Charter. The County levies beach tolls and ad-valorem taxes to fund all beach related expenses. The City

would, if it had the legal authority, prohibit the man-made destruction or removal of the existing primary oceanfront sand dune and the dune vegetation.

- 1.h. Prior to 1992, New Smyrna Beach will review the plan prepared by the county for estuarine and oceanfront shoreline habitat reclamation. The plan will select identified shorelines where reclamation is required to offset impacts from existing upland development, including stormwater discharges, bulk heading, dumping and land clearing. Reclamation will include, but not be limited to:
- Stabilizing shorelines.
 - Creating wetland habitat such as mangrove and salt marsh.
 - Dune restoration.

- 1.j. The Volusia County EMD will annually update the Florida Land Use Cover and Forms Classification System maps and database of the Coastal Management Element Natural Resources Summary Report to reflect changing conditions.

OBJECTIVE 2

Discourage the location of new development in the coastal high hazard area by limiting new public expenditures in these areas.

Land Use

POLICIES:

- 1.b. Designated natural resource areas, significant environmental or ecological features, critical wildlife habitat, environmental system corridors or conservation areas shall be protected through a variety of mechanisms, including buffer zones, restoration, limiting density and intensity, conservation easements, acquisition, density transfers, transfer of development rights (TDRs), purchase of development rights or land exchanges.
- 1.d. Prior to November 1, 1990, develop standards for appropriate densities, intensities, buffer zones, resource protection and location for development adjacent to aquatic and natural preserves, wildlife refuges, and environmental system corridors to protect the natural character, scenic value and public benefit of these areas.
- 2.c. Adopt standards for marina siting or expansion as part of land development regulations, to include the following criteria, and with priority given to expansion of existing marinas.
- 3.h. Redevelopment activity shall not result in increasing hurricane evacuation times above the clearance time identified in the Volusia County Coastal Management Element.
- 3.i. Redevelopment should be viewed as an opportunity to restore beach and dune systems, improve visual appearance, incorporate landscaping and buffer areas, improve traffic circulation, and upgrade stormwater management systems.

Beach and Dune Systems

GOAL: Protect, enhance and restore the functioning of the beach and dune systems, and prohibit development activities that would damage or destroy such systems.

OBJECTIVE 1 Prior to 1992, work with Volusia County to initiate a dune restoration program, and adopt standards to minimize the impacts of structures and development on beach and dune systems.

POLICIES:

- 1.a. Actively participate with the Florida Division of Beaches and Shores to redraw the Coastal Construction Control Line (CCCL).
- 1.b. Protection of property threatened by beach erosion should be encouraged by employing “soft engineering techniques” such as sand nourishment, the development of new sand dunes, or the enhancement of existing or historical dunes.
- 1.c. After the designation of the new CCCL, prohibit the construction of new seawalls, except for the following conditions: (1) replacement of existing seawalls, consistent with policy g. below; (2) in an emergency event to protect public health and safety (if approved by FDNR); and (3) to fill in small gaps (less than 200 feet) within existing seawalls.
- 1.d. Where seawalls are permitted, require them to comply with a county-wide uniform construction code (to be adopted prior to 1993) that specifies minimum design criteria and includes provisions that the seawalls be engineered to withstand a 100-year storm event.
- 1.e. Discourage the man-made destruction or removal of existing dunes and dune vegetation.
- 1.f. Structural development along beaches fronting the Atlantic Ocean shall enhance and not further degrade the coastal beach and dune system.
- 1.g. Reconstruction or replacement of existing hard erosion control structures along the oceanfront which are more than 75 percent destroyed shall be prohibited, except for maintenance and care of public navigational structures (such as Ponce de Leon Inlet) and structures which are needed to protect evacuation routes and public facilities and utilities.
- 1.h. As part of the coastal resource function, participate with Volusia County in the exchange of information, and monitor data collected by FDNR, the US Army Corps of Engineers, the Florida Sea Grant College, universities and other appropriate agencies.

- 1.i. In cooperation with the FDNR, assist Volusia County in the development of information and education programs to inform citizens on how the coastline works. Provide technical assistance to land owners, citizens and community interest groups.
- 1.j. Utilize state and federal grants and community resources to implement beach and dune restoration projects, such as civic association and community group involvement. "Adopt-A-Dune" programs, private donations, or other similar techniques.
- 1.k. Participate with Volusia County in a dune restoration demonstration project, either on public property or in conjunction with a proposed development project.
- 1.l. Incorporate dune restoration projects and revegetation into public improvement projects, such as park and recreation facilities on or adjacent to the beach.
- 1.m. Prepare interlocal agreements with Volusia County and the State of Florida for the funding and development of beach maintenance and restoration programs and projects.
- 1.n. Sands dredged from the Ponce de Leon Inlet should be used to stem beach erosion. If determined not to cause any long-term damage, FDNR should be requested to permit the placement of the dredged sands in the longshore transport zone (surf zone).
- 1.o. Work with Volusia County to develop strategies for responding to sea level rise, including:
 - Analysis of the estimated sea level rise and its effects on estuaries, wetlands, barrier islands and uplands.
 - Identification of structures and areas of possible risk.
 - Determination of additional data and research needed.
 - Assistance from state and federal agencies.
 - Consideration of additional buffer areas from wetlands, water bodies and dunes in order to protect life and property.
 - Evaluation of locating public facilities in areas projected to be affected by rising sea level.
 - Consideration of the effects on potable water sources, saltwater intrusion, septic systems, wastewater treatment facilities and the water table.

Coastal Hazards

OBJECTIVE 1

Evacuation of Population. Maintain the clearance time for the evacuation of the population in the Hurricane Vulnerability Zone at 6 hours, based on a level-of-service standard "D" during time of hurricane or any category storm.

POLICIES:

- 1.a. Land use plan amendments in the Hurricane Vulnerability Zone shall strive to reduce, and shall not increase, the clearance time for evaluation of the population in the Hurricane Vulnerability Zone above 6 hours.
- 1.b. Assess the impact of new development on the hurricane evacuation network to ensure it will not increase clearance time for evacuation of the population in the Hurricane Vulnerability Zone above 6 hours.
- 1.c. Ensure adequate roadway capacity to facilitate the evacuation of residents in the Hurricane Vulnerability Zone. The following roadway improvements shall be made to maintain the hurricane evacuation time period below 6 hours:
 - Widening of the North Bridge by 1996.
 - Continually maintain the New Smyrna Beach Emergency Preparedness Plan and Evacuation Routes Plan, after FEMA training and in conjunction with the Volusia County Plan.
- 1.d. Future roadway improvements shall minimize the impact of flooding and storm damage on evacuation route facilities.
- 1.e. Evacuation routes shall be designated in such a way as to distribute traffic demand to provide optimum utilization of available roadway facilities. This will include the redistribution of a portion of the traffic from the North Causeway to the Harris Saxon Bridge.
- 1.f. Volusia County shall coordinate the Peacetime Emergency Plan and evacuation plan with the New Smyrna Beach plan to ensure the orderly evacuation of the population in the Hurricane Vulnerability Zone.

OBJECTIVE 2

Shelter for Population. In cooperation with the American Red Cross, New Smyrna Beach shall designate hurricane evacuation shelters to protect the population in the Hurricane Vulnerability Zone.

POLICIES:

- 2.a. New Smyrna Beach, in cooperation with the American Red Cross, shall designate hurricane emergency shelter facilities to accommodate at least 23 percent of the population in the Hurricane Vulnerability Zone, based on the appropriate standards.
- 2.b. New hurricane emergency shelter space shall not be located in the Hurricane Vulnerability Zone.

- 2.c. In cooperation with the American Red Cross, existing hurricane emergency shelters, which are located in life-threatening areas susceptible to flooding during a hurricane, shall be replaced as replacement facilities can be identified and agreements secured.

OBJECTIVE 3

Mitigation of Property Damage. Adopt land development regulations governing development in the Hurricane Vulnerability Zone and the Coastal High Hazard Area that minimize danger to life and property.

POLICIES:

- 3.a. If constructed, all public facilities in the Hurricane Vulnerability Zone shall be flood-proofed to ensure minimum damage from storms and hurricanes,
- 3.b. Prior to 1992, examine the need for, and implement where necessary, regulations that provide for: setbacks in areas of critical erosion; conservation and enhancement of dunes and vegetation; flood-proofing of utilities; and appropriate requirements for structural wind resistance and floodplain management.
- 3.c. Prior to 1992, all new residential development in multi-occupancy structures in the Hurricane Vulnerability Zone shall be required to provide continuing information to residents concerning hurricane evacuation and shelters.
- 3.d. All development in the Hurricane Vulnerability Zone shall be consistent with the federal flood hazard requirements.

OBJECTIVE 4

Post-Disaster Redevelopment. Upon completion of the Volusia County Post Disaster Relief Plan, and prior to 1992, the city shall review with Volusia County an evaluation of the long-term problems related to post-disaster relief and redevelopment.

- 4.a. The Post-Disaster Relief Plan shall include: identification of land areas that should not be reconstructed; abandonment and/or relocation of buildings; rebuilding of public facilities; and reconstruction with structural modification.
- 4.b. The Post-Disaster Relief Plan shall also identify structures in the Coastal High Hazard area that might be of some use for public access to coastal beaches and waterways, and shall make recommendations for acquisition when post-disaster opportunities arise. It shall establish guidelines for determining priorities for the acquisition of storm-damaged property in the Hurricane Vulnerability Zone.
- 4.c. The Post-Disaster Relief Plan shall establish principles for repairing, replacing, modifying or relocating public facilities in the Hurricane Vulnerability Zone.
- 4.d. Prior to November 1, 1990, incorporate in the land development regulations the following build-back policy, to be applied after a hurricane:

- Structures damaged less than 50 percent of their replacement cost at the time of damage may be rebuilt to their original condition, subject only to current building and life-safety codes.
- Structures damaged more than 50 percent of their replacement cost at the time of damage may be rebuilt to their original square footage and density, provided that they comply with:
 - Federal requirements for elevation above the 100-year flood level;
 - Building code requirements for flood proofing;
 - Current building and life-safety codes;
 - State coastal construction control lines;
 - Any required zoning or other development regulations (other than density or intensity), unless compliance with such regulations would preclude reconstruction otherwise intended by the build-back policy.
 - Any other relevant federal regulations; and
 - Any other relevant local regulations.
- The land development regulations may establish procedures to document actual uses, densities, intensities and compliance with regulations in effect at the time of construction, through such means as photographs, diagrams, plans, affidavits, permits, appraisals and tax rewards.

4.e. The New Smyrna Beach Emergency Preparedness Plan for post-disaster relief provides for disaster assessment by utilizing immediate repair and clean-up actions, as well as the provision of temporary housing and the provision of individual assistance. These efforts shall be coordinated with Volusia County and other coastal cities. Any development activities shall be consistent with the Hazard Mitigation section of the Emergency Preparedness Plan, until such time as the Post-Disaster Redevelopment element of the Emergency Preparedness Plan is adopted.

OBJECTIVE 5

Public Expenditures. New public expenditures shall be prohibited that will subsidize development inside the coastal high hazard area, unless it is consistent with policies specifically identified in the Coastal Management Element or cross-reference to another appropriate element and included in the Capital Improvements Element.

POLICIES:

- 5.a. The Coastal High Hazard Area is defined as shown on Map VIII-1.
- 5.b. Public facilities may be constructed within the Coastal High Hazard Area when the public facility construction falls into one of the following categories:

- The public facilities are required to meet minimum level of service standards.
- The public facility improvements are required to meet regulatory mandates resulting from changes in laws or rules.
- The public facilities are part of the Community Redevelopment Agency's adopted redevelopment plan.
- The public facility improvements are essential to support other comprehensive plan policies.
- The public facility will provide service on a par with other neighborhoods in the City.

5.c. Prior to the development of public facilities in the Hurricane Vulnerability Zone, it shall be determined that there are no other feasible sites outside that area.

5.d. If constructed, all public facilities in the Hurricane Vulnerability Zone shall be flood proofed to ensure minimum damages from storms and hurricanes.

5.e. When public facilities within the Coastal High Hazard Area are proposed for renovation or expansion, relocation shall be considered as an option.

OBJECTIVE 6

Population Concentrations: The City shall direct population concentrations away from the Coastal High Hazard Area by limiting infill development to the currently established comprehensive plan limits and by acquiring significant undeveloped parcels when feasible.

POLICIES:

6.a. Development within the Coastal High Hazard Area shall be limited to a maximum of 13,583 residential units.

6.b. When feasible, the City shall work with County and State agencies to acquire undeveloped parcels that have significant environmental assets.

Public Access

POLICY 1.b.

The priority for new pedestrian access shall be pedestrian walkovers or other alternatives that do not harm the dune system. Existing unimproved public pathways and improved walkways should be converted to dune walkovers or eliminated, in accordance with a schedule to be established prior to 1991 by Volusia County, and in accordance with the Beach Trust Charter provisions (under litigation).

Public Services

POLICIES:

2.b. Establish a level-of-service "D" for the purpose of calculating the capacity of road facilities to clear evacuees within the hurricane evacuation time.

- 3.a. Development in prime aquifer water recharge areas shall be consistent with the goal of protecting water resources.
- 3.g. Potable water withdrawal from areas east of the ultimate urban boundary should be pumped at an appropriate volume and rate to avoid saltwater intrusion and decreased aquifer levels.

OBJECTIVE 7

Public Buildings. Ensure through capital improvement planning and site selection that public buildings meet the needs of population growth, and are constructed to reduce the potential for damage from storms or flooding.

- 7.b. Locate future school facilities outside of areas susceptible to hurricane storm damage or areas prone to flooding, or as consistent with FS 235 and FAC Rule 7A-2 regarding floodplain and school building requirements.
- 7.c. Cooperate with the Volusia County School Board and the American Red Cross in identifying and designating school facilities as hurricane evacuation and emergency shelters.
- 7.d. Future school facilities should be designed to be used as hurricane evacuation and emergency shelters.
- 7.f. Construct new fire and law enforcement facilities to reduce the potential for damage due to a hurricane or flooding

CONSERVATION ELEMENT

POLICIES:

- 1.a. The city will utilize its development regulations in conjunction with this element to encourage preservation of those areas which have limitations or are environmentally sensitive, such as wetlands, flood hazard areas or areas with severe soil limitations.
- 3.a. The city will utilize its development regulations to encourage the use of natural drainage and storage areas, as well as maintenance and preservation of existing vegetation, in order to filter stormwater runoff and help preserve water quality in the planning area.
- 4.a. The city will support the conservation, appropriate use and protection of the natural functions of existing soils, fisheries, wildlife, wildlife habitats, marine habitats, rivers, bays, floodplains, harbors and wetlands (including estuarial marshes) through the enforcement of land use regulations. The measure of this policy shall be the number of encroachments into conservation areas. At a minimum, the land development regulations will require:
 - An environmental impact analysis for environmentally sensitive sites,
 - Pre-construction and post-construction erosion controls,

- The minimum open space requirements for the City are as follows:
 - Conservation – 70 percent
 - Single-family, Multifamily, and Mobile Home Residential – 40 percent
 - Commercial – 25 percent
 - Industrial – 25 percent

All development adjacent to and surrounding wetlands shall require a 25-foot wetlands buffer; and

- The provisions outlined above are intended to ensure that development will be clustered away from environmentally sensitive portions of the development site, to provide for onsite protection of specimen trees and the habitat of endangered/threatened species.

4.c. The city will coordinate with other government agencies to encourage protection and preservation of sand dunes by promoting construction of boardwalks for pedestrian access to the beach, and by replanting disturbed areas.

5.b. The city will continue active participation in the Federal Flood Insurance program.

6.b. The City will preserve, wherever possible, a minimum of fifty percent (50%) of the existing undisturbed native vegetation through the application of cluster development, open space areas, buffer zones and landscape zones. The City promotes the xeriscape approach to natural vegetation retention. Development will be clustered in order to promote the preservation of specimen trees such as Oaks with trunk diameters 12 inches or greater, or Maple, Sweetgum and Hickory with trunk diameters 18 inches or greater; and to allow for the continuance of wildlife habitat.

OBJECTIVE 7 To provide for the protection, maintenance, enhancement, and utilization of wetlands within the City.

POLICIES:

7.a. The City shall maintain land development regulations consistent with the minimum standards for wetland protection as approved by Volusia County in 1989 by Volusia County, Fla., Ord. 89-8 (July 6, 1989). These standards address the identification of wetlands, mitigation requirements to ensure that there is no net loss of wetlands within the city limits, and a minimum 25-foot wide buffer upland and adjacent to wetlands requirements.

7.b. The City will restrict development in wetlands unless eliminated wetlands are mitigated at a minimum of one-to-one ratio through the enforcement of adopted land development regulations that conform to county minimum wetland protection standards adopted in 1989 by Volusia County, Fla., Ord. 89-8 (July 6, 1989), and through land use designations.

- OBJECTIVE 8 To continue to protect and maintain natural groundwater aquifer recharge areas through enforcement of adopted land development regulations.
- POLICY 8.b The city will encourage preservation and maintenance of secondary natural groundwater recharge areas to enhance their recharge potential through its adopted land development regulations.
- OBJECTIVE 9 To maintain management and control of stormwater runoff for alleviating existing environmental problems and preventing future problems through enforcement of current land development regulations.
- POLICY 9.a. The city shall maintain land development regulations which:
- Regulate management of stormwater runoff to prevent diminished water quality, flooding, loss of groundwater recharge, soil erosion, sedimentation in receiving surface waters and lowering of the water table.
 - Require the use of best management practices to maintain swamps, marshes, flood plains and other wetlands for stormwater management.
 - Require that retention areas are designed and located to maximize their effectiveness for flow attenuation and aquifer recharge; to minimize the need for channelization; and to provide for greater safety and reliability.
- OBJECTIVE 10 To incorporate the inherent limitation of existing soils in land planning and development, and to minimize impacts which result in soil erosion.
- POLICIES:
- 10.a. Prior to any land disturbance, developers shall indicate on their site plans any areas of highly erodible soils, (as defined by the US Department of Agriculture Soil Conservation Service [SCS] or the Florida Department of Agriculture), and shall take adequate measures to ensure that soil erosion is avoided, including utilization of appropriate best management practices.
- 10.b. Construction in soils which are determined to be hydric in character, (as defined by the SCS and the Florida Department of Agriculture), shall be regulated to the extent that the proposed construction activities will not adversely impact protected resources.
- 12.b. Prohibit the development of all wetlands located within floodplains.
- 12.c. Continue to rezone floodplains as Conservation, in order to limit development.

RECREATION AND OPEN SPACE ELEMENT

POLICY 2.a. The City's land development regulations will be used to encourage appropriate use of land in floodplain and waterfront areas, and to promote the protection of natural areas.

CAPITAL IMPROVEMENTS ELEMENT

POLICIES:

2.a. Calculated needs for capital improvements in high hazard coastal areas are subject to all limits and conditions in the "Coastal Management Element" of this Comprehensive Plan.

OBJECTIVE 5 The City shall protect the coastline and avoid loss of life and property in coastal areas by minimizing land development and public facilities in coastal high hazard areas.

POLICY 5.a. The City shall not construct, finance, acquire, accept contributions of, repair or replace any public facilities in coastal high hazard areas, except public facilities expressly permitted in the Coastal Management Element of this Comprehensive Plan.