

ORANGE 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.

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1. County Overview

Geography and the Environment

Orange County is located in Central Florida. It covers a total of 907 square miles with an average population density of 987.8 people per square mile (U.S. Census, 2000).

There are thirteen incorporated municipalities within the County as shown in **Table 1.1**.

Population and Demographics

Official 2004 population estimates for all jurisdictions within Orange 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 Orange is 1,013,937 people (University of Florida, Bureau of Economic and Business Research, 2004). A majority of these residents, or 65%, live in the unincorporated County, while 20.6% live in the largest city, Orlando. Between 1990 and 2000, Orange County as a whole had a growth rate of 32.3%, which is greater than the statewide growth rate of 23.5% in those 10 years.



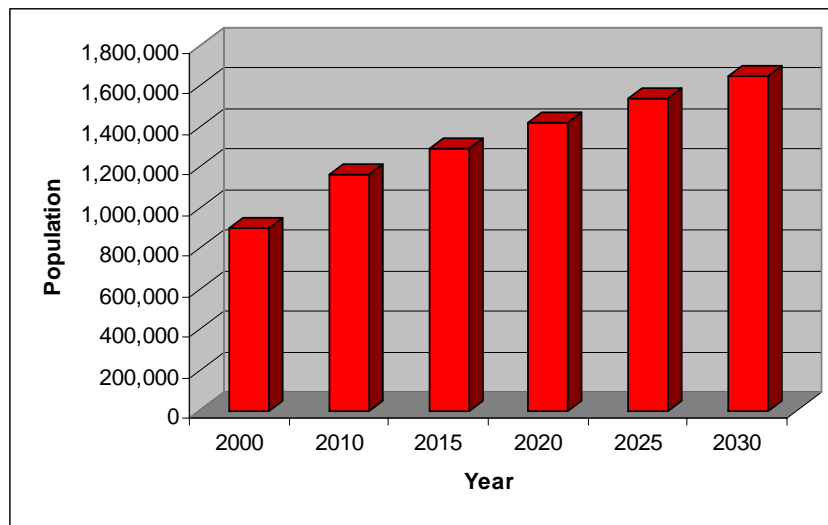
Table 1.1 Population by Jurisdiction

Jurisdiction	Population, Census 2000	Population Estimate, 2004	% Change, 2000-2004
UNINCORPORATED	596,164	662,530	11.1%
Apopka	26,642	32,951	23.7%
Bay Lake	23	28	21.7%
Belle Isle	5,531	6,082	10.0%
Eatonville	2,432	2,467	1.4%
Edgewood	1,901	2,160	13.6%
Lake Buena Vista	16	19	18.8%
Maitland	12,019	16,476	37.1%
Oakland	936	1,678	79.3%
Ocoee	24,391	29,215	19.8%
Orlando	185,951	208,900	12.3%
Windermere	1,897	2,329	22.8%
Winter Garden	14,351	22,242	55.0%
Winter Park	24,090	26,860	11.5%
Countywide Total	896,344	1,013,937	13.1%

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

According to the University of Florida, Bureau of Economic and Business Research (2004), Orange County’s population is projected to continue to grow rapidly, reaching 1,654,400 people by the year 2030. **Figure 1.1** illustrates medium population projections for Orange County based on 2004 calculations.

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



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

Of particular concern within Orange County’s population are those persons with special needs and/or limited resources such as the elderly, disabled, low-income, or language-isolated residents. According to the 2000 U.S. Census, 10.0% of Orange County residents are listed as

65 years old or over, 18.5% are listed as having a disability, 12.1% are listed as below poverty, and 25.4% live in a home with a primary language other than English.

2. Hazard Vulnerability

Hazards Identification

The highest risk hazards for Orange County as identified in the County's Local Mitigation Strategy (LMS) are high wind, lightning and hail, major fire-urban, flood, and drought. Sinkholes and wildfire were not discussed.

Since 1981, 19 tornadoes have touched down in the County, and in 1998, 42 people were killed and 250 people were injured from tornadoes. Seventeen deaths are recorded in Orange County from lightning strikes, and many wildfires in the County have been started from lightning. The County also has had many occurrences of flooding from lack of drainage or overflowing rivers.

Hazards Analysis

The following analysis looks at three major hazard types: 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 Orange County that live within Federal Emergency Management Agency Flood Insurance Rate Map zones, which signify special flood hazard areas. According to these maps, 16.6% of the population, or 148,595 people, are within the 100-year flood zone. A majority of those at risk of flooding are either minority and/or disabled. In Orange County, sinkholes are a major risk, and 96% of the population is within a medium to adjacent-risk sinkhole zone. Wildfire is also a major risk, with 50.6% of the total population in a wildfire risk zone. Column 3 of the table 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. Of those at risk from wildfire, 32.9% are disabled, making a quick evacuation difficult.

Table 2.1 Countywide and Special Needs Populations at Risk from Hazards

Population	Flood	Sinkhole (med-adjacent risk)	Wildfire (med-high risk)
Minority	49,118	272,477	154,858
Over 65	14,641	87,569	42,067
Disabled	47,598	278,416	149,056
Poverty	18,434	104,091	58,013
Language-Isolated	3,035	19,664	9,174
Single Parent	11,134	59,866	32,715
Countywide Total	148,595	861,990	453,366

Source: Florida Department of Community Affairs, 2005a.

Evacuation and Shelters

As discussed in the previous sections, population growth in Orange County has been rapid, and this trend is projected to continue. As the population increases in the future, the demand for shelter space is only going to increase. Also, hurricane evacuees of neighboring coastal counties often seek shelter in Orange County. Currently, there is space for 6,320 people in the County's shelters, but there are 7,618 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 by 25% in the next 4 years to 9,556 people (FDCA, 2004).

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 bounce back from a disaster. **Table 2.2** presents estimates of the number of buildings in Orange County by structure type that are at risk from each of the four hazards being analyzed. As seen in the estimated population at risk statistics in **Table 2.1**, sinkholes put the largest amount of structures at risk as well. For sinkhole and wildfire hazards, the structure type most at risk is single-family homes. For flood hazards, the single-family home takes a close second to mobile homes.

Flooding impacts 129,097 structures in the County. According to the latest National Flood Insurance Program Repetitive Loss Properties list, there are seven homes in unincorporated Orange County that have had flood damage multiple times and received insurance payments (FDCA, 2005b).

Table 2.2 also shows 273,602 structures within medium to adjacent sinkhole risk areas, with 71.4% of those being single-family homes. A total of 66.9% of the structures at risk from wildfire are single-family homes, and 23.6% are multi-family or mobile homes.

Table 2.2 Countywide Number of Structures at Risk from Hazards

Structure Type	Flood	Sinkhole (med-adjacent risk)	Wildfire (med-high risk)
Single-Family Homes	43,391	195,281	105,464
Mobile Homes	43,621	4,093	11,461
Multi-Family Homes	26,013	46,118	25,797
Commercial	9,633	17,114	8,495
Agriculture	5,517	7,338	4,368
Gov./Institutional	922	3,658	2,034
Total	129,097	273,602	157,619

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, and wildfire according to MEMPHIS estimates. This section is used to demonstrate the unincorporated 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 Orange County Property Appraiser's geographic information system (GIS) shapefiles. The future land use maps provided were based on 2002 Orange County future land use GIS shapefiles.

In **Attachment A**, two maps present the existing and future land uses within a 100-year flood zone. There are large swaths of flood-prone areas scattered across the County; however, particularly large clusters are found in the Bay Lake area, north of Lake Apopka, and bordering the St. Johns River. The total amount of land in these special flood hazard areas is 151,039 acres countywide. A total of 20.3% of these acres are currently undeveloped. As shown in **Table 2.3**, most of the flood prone areas are located in parks and recreation or agriculture use areas. **Table 2.4** shows that 31.8% of the undeveloped lands are designated for future rural use at 1 dwelling unit (du) per 10 acres. Another 29.9% of the undeveloped flood-prone areas are designated as water bodies, and so it can be assumed that those acres will truly remain undeveloped.

In **Attachment B**, maps present the land uses associated with high-risk wildfire zones. These wildfire risk areas are scattered across the County, with most on the more rural eastern or western parts of the County. A total of 21.5% of the land within these wildfire zones is currently vacant according to the data in **Table 2.3**. The majority of the land at risk to wildfires is currently used for agriculture. Of the undeveloped acres at risk, 39.8% is designated for rural (1 du/10 acres) uses in the future (**Table 2.4**).

Maps showing the sinkhole hazard zones and associated existing and future land uses can be found in **Attachment C**. As can be seen in the maps, a majority of the County is at risk from sinkholes, with the only non-risk areas being the rural east. **Table 2.3** shows that 21.8% of this area is undeveloped, 23.4% is in agricultural use, 17.4% is single-family residential, and 15% is used for parks and recreation. **Table 2.4** shows that 31.7% of the undeveloped land at risk to sinkholes is also designated for future use as rural (1du/10 acres). Ideally, this hazard zone should be restricted from development or at least be 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 Orange County that are incorporated within one of the municipalities. The land uses within the hazard areas are pretty evenly spread, with between 17.8% and 20.1% still undeveloped for the three risk types. For flood and sinkholes, the largest percentages are found in the agricultural and institutional uses.

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

Existing Land Use Category		Flood	Wildfire Susceptible Areas	Sinkholes
Agriculture	Acres	38,405.5	4,122.2	69,432.9
	%	25.4	46.2	23.4
Attractions, Stadiums, Lodging	Acres	44.4	3.3	1,550.5
	%	0.0	0.0	0.5
Places of Worship	Acres	358.3	3.1	2,079.7
	%	0.2	0.0	0.7
Commercial	Acres	1,133.8	2.0	7,553.8
	%	0.8	0.0	2.5
Government, Institutional, Hospitals, Education	Acres	9,584.7	1,108.9	23,920.2
	%	6.4	12.4	8.1
Industrial	Acres	933.6	45.3	6,145.7
	%	0.6	0.5	2.1
Parks, Conservation Areas, Golf Courses	Acres	48,580.5	771.3	44,535.0
	%	32.2	8.6	15.0
Residential Group Quarters, Nursing Homes	Acres	248.8	0.0	809.7
	%	0.2	0.0	0.3
Residential Multi-Family	Acres	1,394.2	0.0	6,788.9
	%	0.9	0.0	2.3
Residential Mobile Home, or Commercial Parking Lot	Acres	1,155.9	342.6	6,410.8
	%	0.8	3.8	2.2
Residential Single-Family	Acres	9,339.0	603.0	51,600.3
	%	6.2	6.8	17.4
Submerged Land (Water Bodies)	Acres	3,712.0	0.0	4,287.8
	%	2.5	0.0	1.4
Transportation, Communication, Rights-of-Way	Acres	67.8	2.0	646.1
	%	0.0	0.0	0.2
Utility Plants and Lines, Solid Waste Disposal	Acres	5,497.9	1.8	6,338.8
	%	3.6	0.0	2.1
Vacant	Acres	30,582.7	1,918.1	64,761.2
	%	20.3	21.5	21.8
Total	Acres	151,038.9	8,923.7	296,861.2
	%	100.0	100.0	100.0

Data from: Florida Department of Community Affairs, 2005.

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

Future Land Use Category		Flood		Wildfire Susceptible Areas		Sinkhole	
		Total	Undev.	Total	Undev.	Total	Undev.
Activity Center Mixed Use	Acres	1,111	572	609	94	5,065	1,707
	%	0.7%	1.9%	1.9%	1.4%	1.7%	2.6%
Activity Center Residential	Acres	602	300	144	55	1,640	708
	%	0.4%	1.0%	0.5%	0.8%	0.6%	1.1%
Commercial	Acres	1,386	601	596	303	9,514	2,564
	%	0.9%	2.0%	1.9%	4.6%	3.2%	4.0%
Commercial Planned Development	Acres	15	3	6	5	181	73
	%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%
Community Village Center	Acres	13	2	0	0	220	17
	%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%
High Density Residential	Acres	77	35	37	20	346	130
	%	0.1%	0.1%	0.1%	0.3%	0.1%	0.2%
Industrial	Acres	5,416	1,850	1,392	494	16,856	4,703
	%	3.6%	6.1%	4.4%	7.6%	5.7%	7.3%
Industrial Planned Development	Acres	276	0	2	0	0	0
	%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%
Institutional	Acres	4,316	39	2,333	13	11,360	294
	%	2.9%	0.1%	7.4%	0.2%	3.8%	0.5%
Low Density Planned Development	Acres	31	5	12	5	700	126
	%	0.0%	0.0%	0.0%	0.1%	0.2%	0.2%
Low Density Residential	Acres	8,843	2,423	3,772	885	47,744	8,083
	%	5.9%	7.9%	12.0%	13.5%	16.1%	12.5%
Low-Medium Density	Acres	2,731	722	1,617	360	13,935	2,877
	%	1.8%	2.4%	5.1%	5.5%	4.7%	4.4%
Low-Moderate Density Planned Development	Acres	0	0	4	2	70	15
	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Medium Density Residential	Acres	2,290	719	680	224	7,687	1,747
	%	1.5%	2.4%	2.2%	3.4%	2.6%	2.7%
Mixed Use C/HD/PD	Acres	3	0	0	0	62	13
	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Mixed Use C//PD	Acres	72	40	26	3	126	74
	%	0.0%	0.1%	0.1%	0.0%	0.0%	0.1%
Mixed Use C/LD/PD	Acres	44	25	0	0	102	38
	%	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%
Mixed Use C/O/PD	Acres	183	46	6	3	242	96
	%	0.1%	0.2%	0.0%	0.1%	0.1%	0.1%
Mixed Use I/C/PD	Acres	100	0	80	0	124	0
	%	0.1%	0.0%	0.3%	0.0%	0.0%	0.0%
Mixed Use I/IN/O/C/LD/LM/MD/CONS/PD	Acres	338	133	6	4	0	0
	%	0.2%	0.4%	0.0%	0.1%	0.0%	0.0%
Mixed Use LD/C/PD	Acres	21	4	0	0	54	23
	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

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

Future Land Use Category		Flood		Wildfire Susceptible Areas		Sinkhole	
		Total	Undev.	Total	Undev.	Total	Undev.
Mixed Use O/C/SH/PD	Acres	0	0	0	0	17	17
	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Mixed Use O/LD/PD	Acres	0	0	0	0	3	0
	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Mixed Use O/PD	Acres	0	0	0	0	11	11
	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Mixed Use Planned Development	Acres	443	343	424	362	2,036	1,590
	%	0.3%	1.1%	1.3%	5.5%	0.7%	2.5%
Mixed Use TS/MD/H/O/PD	Acres	14	14	1	1	28	28
	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Moderate Density Planned Development	Acres	0	0	0	0	24	0
	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Neighborhood Activity Corridor	Acres	0	0	0	0	42	5
	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Neighborhood Center	Acres	0	0	0	0	32	6
	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Neighborhood Residential	Acres	0	0	0	0	71	12
	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
No Data	Acres	5	2	4	1	41	3
	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Office	Acres	254	118	168	95	1,559	577
	%	0.2%	0.4%	0.5%	1.5%	0.5%	0.9%
Orlando	Acres	0	0	0	0	17	17
	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Parking/RET/LD/Planned Development	Acres	0	0	0	0	1	0
	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Parks/Recreation	Acres	33,396	412	2,185	91	29,121	549
	%	22.1%	1.3%	6.9%	1.4%	9.8%	0.8%
Planned Development Restaurant/Convenience Store	Acres	0	0	0	0	2	0
	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Planned Development	Acres	1,014	596	159	96	1,533	680
	%	0.7%	1.9%	0.5%	1.5%	0.5%	1.0%
R/Planned Development	Acres	171	113	196	38	830	283
	%	0.1%	0.4%	0.6%	0.6%	0.3%	0.4%
Rural 1/1*	Acres	1,873	504	1,333	293	11,520	2,839
	%	1.2%	1.6%	4.2%	4.5%	3.9%	4.4%
Rural 1/10*	Acres	53,097	9,736	13,245	2,609	86,478	20,555
	%	35.2%	31.8%	42.1%	39.8%	29.1%	31.7%
Rural 1/2*	Acres	334	67	463	81	836	237
	%	0.2%	0.2%	1.5%	1.2%	0.3%	0.4%
Rural 1/5*	Acres	321	57	309	65	2,823	793
	%	0.2%	0.2%	1.0%	1.0%	1.0%	1.2%

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

Future Land Use Category		Flood		Wildfire Susceptible Areas		Sinkhole	
		Total	Undev.	Total	Undev.	Total	Undev.
Rural Settlement/Low Density	Acres	0	0	3	0	81	16
	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Traditional Neighborhood	Acres	697	433	0	0	1,691	1,170
	%	0.5%	1.4%	0.0%	0.0%	0.6%	1.8%
TS/Planned Development	Acres	0	0	2	0	4	0
	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Village	Acres	6,709	1,536	1,114	179	19,930	4,058
	%	4.4%	5.0%	3.5%	2.7%	6.7%	6.3%
Water Body	Acres	24,845	9,135	539	166	22,105	8,026
	%	16.4%	29.9%	1.7%	2.5%	7.4%	12.4%
Total	Acres	151,039	30,583	31,467	6,549	296,861	64,761
	%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

*Ratio represent number of dwelling units per acre.

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		Flood	Wildfire Susceptible Areas	Sinkholes
Agriculture	Acres	7,035.2	1,299.9	13,022.0
	%	18.7	16.9	13.2
Attractions, Stadiums, Lodging	Acres	4,157.0	41.0	5,247.8
	%	11.0	0.5	5.3
Places of Worship	Acres	159.2	35.2	983.3
	%	0.4	0.5	1.0
Commercial	Acres	657.2	95.0	5,449.5
	%	1.7	1.2	5.5
Government, Institutional, Hospitals, Education	Acres	7,292.7	2,173.8	18,007.0
	%	19.3	28.2	18.2
Industrial	Acres	934.1	118.2	3,602.1
	%	2.5	1.5	3.6
Parks, Conservation Areas, Golf Courses	Acres	4,209.4	1,305.9	5,870.0
	%	11.2	16.9	5.9
Residential Group Quarters, Nursing Homes	Acres	98.3	9.8	393.3
	%	0.3	0.1	0.4
Residential Multi-Family	Acres	1,200.9	151.8	4,803.7
	%	3.2	2.0	4.9
Residential Mobile Home, or Commercial Parking Lot	Acres	113.0	45.3	945.7
	%	0.3	0.6	1.0
Residential Single-Family	Acres	2,418.1	671.7	18,602.6
	%	6.4	8.7	18.8
Submerged Land (Water Bodies)	Acres	1,049.3	66.0	1,738.2
	%	2.8	0.9	1.8
Transportation, Communication, Rights-Of-Way	Acres	41.0	28.8	294.7
	%	0.1	0.4	0.3
Utility Plants and Lines, Solid Waste Disposal	Acres	1,634.5	118.4	2,066.6
	%	4.3	1.5	2.1
Vacant	Acres	6,709.8	1,549.1	17,989.8
	%	17.8	20.1	18.2
Total	Acres	37,709.7	7,709.8	99,016.1
	%	100.0	100.0	100.0

Data from: Florida Department of Community Affairs, 2005.

3. Existing Mitigation Measures

Local Mitigation Strategy

Orange 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. The availability and functioning of the community's infrastructure will not be significantly disrupted by a disaster here**
 - 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
 - Sources of energy normally used by the community will not be unwarrantedly vulnerable to the impacts of disaster
 - The telecommunications systems and facilities serving the community will not be unwarrantedly vulnerable to the impacts of 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

- 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 a disaster
 - Shelters or structures for vehicles and equipment needed for emergency services operations will be retrofitted or relocated to withstand the 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 health, safety and welfare of the community's residents and visitors will not be threatened by disasters**
- 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

Comprehensive Emergency Management Plan

The Orange 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 Orange County was not available for review at the time this profile was drafted. If Orange 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

Orange County is a participant in the National Flood Insurance Program's Community Rating System with a Class 7 rating.

4. Comprehensive Plan Review

Orange County's Comprehensive Plan (adopted in 2000) 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 D**. The following is a summary of how well the plan addressed the three hazards of this analysis.

Orange County's Comprehensive Plan had many policies considered to be best management practices for flood mitigation. An important policy was to simply identify and prioritize flood-prone areas on an ongoing basis (Policy 1.3.5). Additionally, a policy for recording flood events and their details provides good material for analysis and implementation. There were numerous policies aimed at preserving natural hazard protection features of the environment, such as wetlands, floodplains, and natural vegetation buffers around waterbodies. Building upon these policies were other policies that aimed at acquiring land in the 100-year floodplain and preserving these areas for open space and recreation. For those special flood hazard areas that cannot be preserved, the County has policies for elevating new construction and for floodproofing existing structures. These policies correspond with objectives under Goals 1, 5, and 6 of the LMS that promotes identification of hazards, retrofitting residential structures to withstand hazards, and protecting high hazard areas from development. The Plan also has several policies related to stormwater management and one related to continued involvement in the National Flood Insurance Program, which directly relates to an objective under Goal 6 of the LMS.

Wildfire was very briefly and broadly alluded to in the Comprehensive Plan. In the Fire Rescue Element, one policy simply stated that the County Fire Rescue would meet standards for mitigating wildfires (Policy 2.2.4). In the Conservation Element, there was a policy that required compatible land uses and regulations near conservation areas so that they could be managed, including the use of prescribed fire (Policy 1.9.2). In addition, the Plan includes numerous policies to conserve water, which will insure that there is an adequate water supply for fighting future wildfires, although this reason is not mentioned in the policies.

There were multiple policies found during this review that indirectly related to sinkhole hazards, however there were none that specifically cited a need to regulate sinkhole hazard areas. The Aquifer Recharge, Conservation, Intergovernmental Coordination, and Potable Water Elements have many policies aimed at conserving groundwater and protecting land that acts as a recharge area to the aquifer. By keeping as much water as possible in the aquifer, the County is helping to prevent human-induced sinkholes that can be caused by decreases in the aquifer levels beneath karst features that are already susceptible to sinkhole activity.

The Comprehensive Plan also has many good policies referring to the responsibilities of the Office of Emergency Management that correspond to the objectives under Goal 3 of the LMS. Another policy recommended for hazard mitigation was found under the Capital Improvements Element, referring to criteria for eliminating a public hazard and public safety to be considered in evaluating projects to be funded.

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.

Orange 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 disconnect 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 flooding, wildfire, and sinkholes, the County should consider other hazards if appropriate, such as tornadoes and soil subsidence, during the update of the local Comprehensive Plan.

Comprehensive Plan

The LMS has several objectives that relate to identifying hazard areas and reviewing the effectiveness of mitigation measures. This should definitely be a first step in hazard planning and yet there are only policies relating to flood hazards that highlight the need to identify these hazard zones. It is recommended that the County also work to include data and analysis in their Plan that identify geographic areas, such as the analyses included in this profile for sinkholes and wildfire. This sort of information can lead to planning policies such as overlay zones that increase building code requirements or land development regulations for only those areas that are at risk from the hazard. The County could also add a policy into the Comprehensive Plan that requires that mitigation measures and hazard identification be reviewed on a regular basis, such as during the EAR review, so as suggested in the LMS, lessons learned can be applied and mitigation can be improved in the future.

Another goal of the LMS is to decrease damage from hazards to infrastructure and public buildings, especially those that operate in emergencies. The Comprehensive Plan was surprisingly silent on this subject. There are many options for including the protection of public investments from disaster impacts. The Capital Improvements Element could require that public facilities and infrastructure be limited in defined hazard zones and that when they must be located in a risk area, the proper mitigation such as floodproofing or firewise construction should be required. Public facilities also could be required to be built to higher standards for windborne-debris and flood protection than the Florida Building Code requires.

Another issue that was absent from the Comprehensive Plan but that is an objective of the LMS is evacuation and sheltering. As discussed in Section 2 of this profile, there currently is a deficit in shelter capacity for the County. One way to address this in the Comprehensive Plan could be to set an emergency shelter capacity level of service that must be maintained as the County

continues to grow. If the County chose to, they could assess impact fees to keep up with the demand for shelter space. Another way to address shelter capacity could be to encourage residents and developers to include safe rooms in new homes that are located outside of flood zones. If more residents can shelter in their own home from high-wind storms, then there will be less demand for shelter space and a decrease in evacuation needs. This would also be a great way to decrease loss of life from tornadoes. Also, the Transportation Element should include policies that ensure adequate road widths for evacuation routes and that require more than one exiting roadway from a subdivision in high-risk fire zones.

Another issue addressed in the LMS but not in the Comprehensive Plan was a Post-Disaster Redevelopment Plan. As stated in the LMS, this would be a great way to “guide decision-making and resource allocation” after a disaster, and it is encouraged by Rule 163 of the Florida Statutes.

The Comprehensive Plan was also lacking in some areas not mentioned in the LMS goals and objectives. While sinkhole hazards were indirectly addressed through the County’s many policies aimed at conserving water and maintaining the aquifer’s functionality, a policy should be added directly related to sinkholes that prohibits development in a high-risk zone without first investigating the stability of the soils. In addition, the subject of wildfire is not adequately addressed despite it being a risk for the County. Risk areas should be identified on land use maps, and overlay zones could be created that require Firewise principles be used in site design, building materials, and landscaping.

There are many 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 a more detailed list 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 in graphical form could be included in both plans, and both plans need to give more attention to wildfire and sinkhole hazards. Overall, the objectives in the LMS are broad and could include more detailed policies such as the ones in the Comprehensive Plan that would flow into implementation projects more easily. When the LMS refers to limiting infrastructure failure due to a disaster, this could be further explained by referring to specific policies that would minimize the location of infrastructure in risk areas and employ mitigation techniques for infrastructure that cannot be relocated. The County’s projects and initiatives listed in the LMS should be included in the capital improvements schedule through a procure that could be laid out in both the LMS and the Capital Improvements Element. Overall, the LMS could be enhanced and further connected with specific policies in the County Comprehensive Plan.

6. Sources

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Attachment A

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

Attachment B

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

Attachment C

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

Attachment D

Orange County Comprehensive Plan Excerpts Related to Hazard Mitigation

Aquifer Recharge Element

OBJECTIVE 1.1

Orange County shall continue to implement, on an ongoing (Amend. 12/00, Ord.#00-25) basis, existing programs such as the CONSERV II program, the Rapid Infiltration Basins, the septic tank monitoring program, the County Landfill monitoring program, and the review of the United States Geological Survey's potentiometric monitoring program and continue to participate in the interlocal agreement that pertains to the Drainwell Modification Study. Additional programs to protect the water quality and quantity in the aquifers, shall be pursued and established on an ongoing basis, including development criteria in the Land Development Code.

POLICIES

1.1.3 The Land Development Code shall contain a definition and map of potential aquifer areas in Orange County.

1.1.4 Orange County with the cooperation of the Water Management Districts, has developed a detailed topographic map of the areas of high aquifer recharge.
(Amend. 12/00, Ord.#00-25)

1.1.6 The Land Development Code shall include regulations/criteria for determining the aquifer recharge potential of a site during the development review stage.

1.1.7 The Land Development Code shall require the total on-site retention of the 25-year, 24-hour storm event in identified recharge areas.

1.1.7.1 Aquifer recharge areas typically comprise Hydrologic Soil Group Type "A", as indicated on the Soil Survey Map for the County prepared by the U.S.D.A. Soil Conservation Service. Regulations shall be adopted as part of the Land Development Code require a detailed soils report prepared by a geotechnical engineer to be submitted to the County prior to site development plan approval if such soils exist on-site. If the site is determined to be within a high recharge area, retention of the total run-off generated by a 25-year frequency, 24-hour duration storm event from the developed site will be required.
(Added 8/92, Ord.#92-24)
(Amend. 12/00, Ord.#00-25)

1.1.8 By June 1992, the aquifer recharge protection regulations in the Land Development Code shall address the need for clustering units in order to provide maximum recharge. This shall be accomplished through such mechanisms as, but not limited to, a special zoning district or open space and impervious surface requirements.

- 1.1.9 Orange County shall provide technical assistance to the Water Management Districts and United States Geological Survey for the purposes of researching the impacts of impervious surface ratios and land development on the natural rate of aquifer recharge, and preparing Groundwater Basin Resource Availability Inventories. The Land Development Code criteria regulating land uses in these areas shall be reassessed at the conclusion of these studies.

Capital Improvements Element

POLICIES

- 1.1.4 (Amend. 12/00, Ord.#00-25) Projects submitted for inclusion in the Capital Improvements Program will be evaluated annually and prioritized by a committee composed of staff from the appropriate County departments. Projects will be evaluated and prioritized based on the following criteria:
- elimination of a public hazard;
 - consistency with the Comprehensive Plan;
 - elimination of an existing deficiency;
 - required by legislative mandate;
 - needed to maintain level of service standard;
 - financial feasibility;
 - public safety;
 - local priorities; and,
 - consistency with plans of surrounding jurisdictions and agencies.

Conservation Element

GOAL 1

- Orange County shall conserve, protect, and enhance the County's natural resources including air, surface water, groundwater, vegetative communities, wildlife listed as threatened, endangered, or species of special concern, soils, floodplains, recharge areas, wetlands, and energy resources to ensure that these resources are preserved for the benefit of present and future generations.
- 1.2.5 (Amend. 12/00, Ord.#00-25) Orange County shall continue to protect shoreline vegetation by restricting the removal of native vegetation, Orange County shall restrict vegetation removal through implementation of the Land Development Code requirements to that which is necessary for access and reasonable use.
- 1.2.6 (Amend. 12/00, Ord.#00-25) Orange County shall continue to improve design standards, monitoring, construction and maintenance requirements for stormwater retention/detention systems, and shall ensure compliance of these requirements to prevent degradation of the receiving surface water bodies. These requirements shall be included in the Land Development Code.

OBJECTIVE 1.3

Orange County shall protect the natural functions of floodplains and flood zone areas to maintain flood-carrying and flood-storage capacities, to protect life and property, and to continue to maintain its eligibility in the National Flood Insurance Program by implementing the following policies.

POLICIES

1.3.1
(Amend. 12/00, Ord.#00-25)

Orange County shall continue to improve and enforce the Orange County Floodplain Management Ordinance by requiring compensatory storage for encroachment in floodplains, restricting encroachment in floodways, and requiring habitable structures to be floodproofed.

1.3.2

Orange County shall continue to identify and recommend, to the State and the Water Management Districts, floodplains that would warrant acquisition under the Conservation and Recreation Lands Program and the Save Our Rivers Program.

1.3.4
(Amend. 12/00, Ord.#00-25)

Orange County shall strengthen floodplain protection requirements for riverine systems by adopting regulations prohibiting floodplain encroachment without compensating storage.

1.3.5
(Amend. 12/00, Ord.#00-25)

Orange County shall, on an ongoing basis, in conjunction with other appropriate agencies such as the Water Management Districts, identify and prioritize problem floodplain areas in need of corrective measures.

OBJECTIVE 1.4

Orange County shall protect identified wetland areas and existing wildlife habitats by implementing the following policies.

POLICIES

1.4.0
(Added 8/92, Ord.#92-24)

Environmentally Sensitive Lands, per 9J-5, Florida Administrative Code and Chapter 163, Florida Statutes, for the purposes of this comprehensive plan shall mean Class I conservation areas as defined in Conservation Policy 1.4.1.

1.4.1
(Amend. 8/92, Ord.#92-24 & 12/00, Ord.#00-25)

Orange County shall continue to adopt regulations which protect and conserve wetlands. Such regulations shall include criteria for identifying the significance of wetlands. Class I conservation areas shall mean those wetland areas which meet at least one of the following criteria:

- A. Any wetland of any size that has a hydrological connection to natural surface water bodies or Floridan aquifer; or
- B. Any wetland of any size that is within a lake littoral zone; or
- C. Any large isolated uninterrupted wetlands forty (40) acres or larger; or
- D. Any wetland of any size that provides critical habitat for federal and/or state listed threatened or endangered species.

Class II conservation areas shall mean those wetland areas which meet any of the following criteria:

- A. Consist of isolated wetlands or formerly isolated wetlands which by way of man's activities have been directly connected to other surface water drainage; and are greater than or equal to five (5) acres; or
- B. Are less than 40 acres and do not otherwise qualify as a Class I conservation area.

Class III conservation areas shall mean those wetland areas which meet all of the following criteria:

- A. Isolated wetlands less than five (5) acres; and
- B. Do not otherwise qualify as a Class I or Class II conservation area.

The regulation shall also identify if and to what extent the conservation area is allowed to be altered and the mitigation requirements for unavoidable loss.

The removal, alteration or encroachment within a Class I Conservation Area shall only be allowed in cases where no other feasible or practical alternatives exist that will permit a reasonable use of the land or where there is an overriding public benefit. The protection, preservation and continuing viability of Class I conservation areas shall be the prime objective of the basis for review of all proposed alterations, modifications, or removal of these areas.

Removal, encroachment or alteration for Class II conservation areas should be presumed to be allowed unless removal, encroachment or alteration is contrary to the public interest. Removal, encroachment or alteration may be allowed in Class III conservation areas.

When encroachment, alteration or removal of a conservation area is permitted, habitat compensation or mitigation as a condition of development approval shall be required. The basis for mitigation shall be categorized by type of wetland area. The mitigation shall be required to replace the habitat and functions performed by the conservation areas destroyed. Reasonable assurance can be provided by type for type mitigation at the ratios set by the regulations, which shall be no less than the following:

Class I conservation areas: case by case basis, but not less stringent than the mitigation requirements for Class II conservation areas.

Class II conservation areas:

- A. Freshwater marshes and wet prairies - 1.5:1.
- B. Cypress wetlands - 2.0:1.
- C. Hydric hammocks, bayheads, and mixed hardwood swamps - 2.5:1.

Class III conservation areas - 1:1.

For off-site, unlike, or other mitigation proposals, ratios shall be determined on a case by case basis.

The regulation shall stipulate that the following types of mitigation shall be given priority:

- A. Restoration of non-functional wetlands;
- B. Off-site preservation of wetland and upland systems;
- C. Creation of type-for-type mitigation areas adjacent to preserved Class I Conservation Areas or that connect Class I, II and/or III conservation areas; and,
- D. Creation of type for type mitigation areas.

1.4.2

Orange County shall coordinate with the Army Corps of Engineers, the Florida Department of Environmental Regulation, and the St. Johns River and South Florida Water Management Districts to identify and regulate wetland areas under their jurisdiction.

1.4.3
(Amend. 12/00, Ord.#00-25)

Orange County shall continue to establish regulations in the Land Development Code concerning upland buffer areas adjacent to major riverine systems and Outstanding Florida Waters wetland systems, in order to protect water quality, preserve natural wetland functions, and preserve wildlife listed as threatened, endangered, or species of special concern.

1.4.4
(Deleted 12/00, Ord.#00-25
Added 05/03, Ord.#03-03)

The future land use designation of Preservation shall be established to recognize publicly or privately owned lands of significant environmental importance for the purposes of environmental protection. Publicly owned lands designated Preservation shall be lands owned by federal, state, or local governments acquired for environmental preservation, rehabilitation, or management. Privately owned lands such as wetland mitigation banks, Regional Offsite Mitigation Areas and environmentally sensitive properties owned by the Florida Audubon Society, Nature Conservancy or similar types of non-profit entities, may be designated as Preservation so long as formal consent is provided.

Compatible very-low impact recreational or educational uses, such as hiking, non-motorized boating, bird watching, horseback riding, fishing, primitive camping, and nature study, that utilize natural amenities of the site for public benefit are allowable uses in the Preservation designation, so long as these uses avoid human encroachment into warranted, environmentally-sensitive areas. All other uses are prohibited. Furthermore, development within areas designated Preservation cannot exceed a 1.0 Floor Area Ratio.

1.4.5
(Amend. 12/00, Ord.#00-25) The Conservation/Wetlands designation on the Future Land Use Map shall serve as a conceptual indicator of conservation and wetland areas. The precise delineation of these areas shall be determined through site-specific studies and field determinations which assess the extent of wetland vegetation, consistent with Conservation Policy 1.4.1. If an area designated as Conservation/Wetlands on the Future Land Use Map is determined to be a developable area, the Future Land Use Map designation shall be as shown.

1.4.6
(Added 6/95, Ord.#95-13)
(Amend. 12/00, Ord.#00-25) Off-site mitigation for wetland impacts will be considered only when the mitigation site is located within Orange County. This applies to all Class I wetland areas, wetland and upland preservation, enhancement and creation of wetlands. For Class II and III wetland impacts mitigation shall be allowed out of the County unless the impacts will result in secondary and cumulative impacts. All impacts associated with Orange County Capital Improvement Projects must be mitigated for within Orange County. The Board of County Commissioners may approve out of County mitigation areas on a case by case basis; this includes mitigation banks, which benefit the County's wetland resources.

OBJECTIVE 1.5 Orange County shall require proper soil management practices to avoid erosion. This objective shall be made measurable by implementing the following policies.

1.5.2
(Amend. 12/00, Ord.#00-25) Orange County shall on an ongoing basis, assist the Soil Conservation Service with those activities directed at minimizing soil erosion, including the adoption and enforcement of Best Management Practices for agriculture and urban development.

1.5.3 Orange County shall assist the Water Management Districts, Florida Department of Environmental Regulation, Florida Department of Natural Resources, and other applicable agencies to improve soil management along Orange County surface water bodies. This assistance may include, but not be limited to, protection and planting of desirable native species of vegetation.

1.5.4 Orange County shall incorporate regulations into the Land Development Code concerning soils and their suitability for future development. These regulations shall include restricting development in hydric soils, preservation of groundwater recharge areas, and controlling the use of and individual on-site sewage disposal facilities.

1.6.2 Orange County shall prohibit mining activities that adversely impact prime water recharge areas and/or lower groundwater potentiometric surface elevations.

1.7.11
(Added 12/00, Ord.#00-25) Orange County, using the 1995 "Environmental Constraints Development Suitability Mapping" by HDR Inc., shall prioritize and for acquisition based on its ability to provide the following: habitat corridors, high ranking vegetative cover, species diversity, hydrologic function, ecological integrity and aquifer recharge potential

- 1.9.2
(Amend. 12/00, Ord.#00-25) Orange County shall continue to require compatible land uses and enhanced protective mechanisms, such as, but not limited to, buffers, setbacks, density restrictions, easements, and fire management that will permit continued habitat management practices in areas adjacent to major, managed natural resources. This is necessary in order to minimize adverse impacts from development and allow continuation of management activities for these areas.
- 1.9.3
(Amend. 12/00, Ord.#00-25) Orange County shall continue to establish Interlocal Agreements with adjacent counties and municipalities to protect rare upland vegetative communities and all wetland vegetative communities that are located in more than one jurisdiction.
- 1.11.6
(Added 8/92, Ord.#92-24)
(Amend. 12/00, Ord.#00-25) Aquifer recharge areas typically comprise Hydrologic Soil Group Type "A", as indicated on the Soil Survey Map for the County prepared by the U.S.D.A. Soil Conservation Service. Regulations shall be adopted as part of the Land Development Code, which require a detailed soils report prepared by a geotechnical engineer to be submitted to the County prior to site development plan approval if such soils exist on-site. If the site is determined to be within a high recharge area, retention of the total run-off generated by a 25-year frequency, 24-hour duration storm event from the developed site will be required.
- 2.2.1 A buffer zone of five hundred and fifty (550) feet shall be required from the landward limit of waters of the State (17-301.400, FAC) or the landward edge of the wetlands associated with the River, whichever is the greater. No activity shall be permitted in the buffer zone unless the proposed activity can be shown to pose no significant threat to water quality, water quantity or wildlife habitat for wetland dependent species. Such regulations shall be included in the Land Development Code by December 1991.
- 2.2.2
(Amend. 12/00, Ord.#00-25) The Orange County Conservation Ordinance, which restricts and regulates development in wetland areas, shall continue to be enforced.
- 2.2.3 In order to preserve native vegetation to the maximum extent possible, clustering of development or submission as a Planned Development (P-D) shall be encouraged within the Wekiva River Protection Area.
- 2.2.7
(Amend. 12/00, Ord.#00-25) Pre-development and post-development stormwater run-off rates shall be equal.
- OBJECTIVE 2.3 Orange County shall protect and preserve the surface water quality and quantity, wildlife populations and habitat, aesthetics, open space, historical and archaeological resources, floodplains, wetland areas, native upland areas and recreation lands of the Econlockhatchee (Econ) River Basin by implementing the following policies.

2.3.1
(Amend. 12/00, Ord.#00-25)

The Land Development Code shall provide for the protection of the Econ River Basin through mechanisms such as upland buffers, specific restrictions within a 2,200 foot total width protection zone, requiring habitat and historical/archaeological resource assessments and protection, allowing for mitigation, open space or density credits, requiring landscaping to include use of native plant species, utilization of wetland areas as part of drainage facility systems, requiring State or Federal listed species protection, clustering of development, restricting floodplain encroachment, and limiting forested habitat fragmentation.

OBJECTIVE 2.4
(Added 12/00, Ord.#00-25)

Orange County shall help restore, protect and preserve the surface water quality and quantity, wildlife populations and habitat, aesthetics, open space, historical and archaeological resources, floodplains, wetland areas, native upland areas and recreation lands of the Lake Apopka River Basin by implementing the following policies.

Fire Rescue Element

2.2.4

Orange County Fire Rescue shall implement and maintain all federal, state and departmental standards and plans intended to mitigate the impact of wildfire disasters in Orange County.

GOAL 4

DISASTER PREPAREDNESS AND COORDINATION
To provide comprehensive emergency management, preparedness and mitigation services to County residents, visitors and those in other communities which we assist.

OBJECTIVE 4.1

Emergency Management
Orange County Fire Rescue's Office of Emergency Management shall maintain all mandatory federal, state and departmental emergency management service standards and plans intended to prepare for, respond to, recover from, and mitigate the impacts of disasters that could adversely affect the health, safety and/or general welfare of the citizens of and visitors to Orange County.

POLICIES

4.1.1

The Office of Emergency Management shall take steps to reduce the vulnerability of people and communities of this County to damage, injury, and loss of life and property resulting from natural, technological or manmade emergencies, catastrophes, or hostile military or paramilitary action.

4.1.2

The Office of Emergency Management shall prepare for prompt and efficient response and recovery to protect lives and property affected by emergencies.

4.1.3

The Office of Emergency Management shall respond to emergencies using all systems, plans and resources necessary to preserve the health, safety and welfare of the citizens of and visitors to Orange County.

- 4.1.4 The Office of Emergency Management shall coordinate recovery from emergencies by providing for the rapid and orderly start of restoration and rehabilitation of persons and property affected by emergencies.
- 4.1.5 The Office of Emergency Management shall provide an emergency management system embodying all aspects of pre-emergency preparedness and post emergency response, recovery and mitigation.
- 4.1.6 The Office of Emergency Management shall take steps to minimize damage to property, material shortages, and service system disruptions that would have an adverse impact on the residents, the economy, and the well being of the County.
- 4.1.7 The Office of Emergency Management shall manage emergency operations within the County by coordinating the use of resources available from municipal governments, private industry, civic and volunteer organizations, and State and Federal agencies.

Future Land Use Element

- 1.2.6.1 (Amend. 5/96, Ord #96-11) As part of the Planned Development zoning process, Orange County shall approve specific development regulations or developers agreements to implement the Growth Center/Resort/P-D. Such regulations shall include the following, if applicable:
 - A. Specific development guidelines including, but not limited to, Floor Area Ratios (FAR), stormwater facilities, parking, landscaping, lighting, open space, access, building coverage, signage, buffers, height, pedestrian access, impervious surface area, permitted and prohibited uses, traffic, streetscape, provisions for residential clustering, density bonuses, transfer of development rights, and required approved mixture of uses.
- 1.2.6.2 (Amend. 5/96, Ord.#96-11 & 12/00, Ord.#00-25) Individual comprehensive plan amendments shall include a preliminary small area analysis incorporating the following:
 - 1. Identification of extent and location of natural features in the area of request. Including, but not limited to, wetlands, potential for rare upland areas, potential for threatened, endangered, and species of special concern for flora and fauna.
 - 2. Identification of the environmental opportunities and constraints to development within the area. Including, but not limited to, extent of 100 year flood areas, recharge potential, and soil suitability.
 - 4. Identification of the preliminary area suitable to address stormwater management requirements.

- 2.2.4.1
(Added 6/94, Ord.#94-13)
- Notwithstanding the density calculation requirements of Future Land Use Policy 2.2.4, which excludes Conservation Areas and natural surface water bodies, developments may include natural surface water bodies within the gross land area if the following criteria are met:
- A. The natural surface water body, the limits being that of the Normal High Water Elevation, is totally confined within the boundaries of the property;
 - B. The natural water body was contained within the property's boundary as of the effective date of this amendment;
 - C. Development proposals of over 100 acres intending to use this bonus must cluster development and have final approval as a Planned Development;
 - D. Development meet all other regulations related to minimum lot size and setbacks; and,
 - E. Property utilizing this policy must be a minimum of twenty (20) acres in total, including such natural surface water bodies.
- 4.2.5
- The Land Development Code shall require stormwater management systems to retain or detain with filtration, one-half inch of run-off from the developed site, or the run-off generated from the first one inch of rainfall on the developed site to provide for water quality treatment.
- 4.2.7
(Amend. 8/92, Ord.#92-24)
- All actions taken by the County with regard to development orders shall be consistent with Conservation Policy 1.4.1 and the regulations adopted pursuant thereto with respect to wetland protection.
- 4.2.8
- The Land Development Code shall specify wetland areas shall be incorporated into the design of development proposals in a manner that will, in a post development environment, maintain their productive functioning subject to the provisions of Future Land Use Policy 4.2.7.
- 4.2.9
(Amend. 12/00, Ord.#00-25)
- Orange County shall promote, through land development regulations and/or acquisition, the protection of rare upland vegetative communities. Such regulations may include, but shall not be limited to, cluster developments, transfer of development rights, buffering sensitive areas, and the identification and designation of wildlife corridors to discourage fragmentation.
- 4.2.12
(Amend. 8/92, Ord.#92-24)
- County shall continue to require the floodproofing of structures and the restriction of development which diminishes flood-carrying or flood-storage capacities. The County shall also continue to require non-residential and residential development in special flood hazard areas, as defined by the Federal Emergency Management Agency, to have the lowest floor, including basement, elevated no lower than one foot above the base flood elevation; and, if solid perimeter walls are used to elevate structures, openings sufficient to facilitate the unimpeded movement of floodwater, as well as continue to

prohibit development within floodways which increase flow levels to protect areas subject to periodic or seasonal flooding. These requirements shall be adopted as part of the Land Development Code by December 1, 1991.

6.1.10
(Added 6/95, Ord.#95-13
Amend. 5/97, Ord.#97-07
Amend. 3/99, Ord.#99-04)

TRANSFER OF DEVELOPMENT RIGHTS (TDR)

In order to encourage the implementation of the greenbelt requirements in Policy 6.1.8, preserve other important uplands, agriculture areas, water reuse area, Floridan aquifer recharge, wetland connections and wildlife corridors, Orange County may allow the Transfer of Development Rights from these sending areas to receiving areas in Orange County. To provide rights-of-way for limited expressways or principal arterial roadways necessary to support the villages, Orange County will allow Transfer of Development Rights (TDR) from the rights-of-way to developable receiving areas. Transfer will be limited to the property on which the right-of-way is located or within 1/4 mile of the right-of-way sending area, whichever is greater. Net density in Village Centers and the Town Center may be increased from 5.0 DU/net developable acre up to 16 DU/net developable acre where TDRs are utilized. However, the implementation of the greenbelt requirements in Policy 6.1.8 and the preservation of other important uplands, agricultural areas, water reuse areas, critical Floridan Aquifer recharge sites, wetland connections and wildlife corridors will not be limited to Transfer of Development Rights. Orange County may allow for purchase of these areas through special taxing districts and special impact fees for a specific Village to be utilized in the establishment of that Village. Orange County shall implement an ordinance implementing Transfer of Development Rights. The TDR ordinance shall enhance the preservation of ecologically sensitive areas and reinforce the defined village edge by identifying TDR sending areas within the Village Greenbelt as identified in policy 6.1.8. The use of TDRs also provides for protection of private property rights within the sending areas. Additionally, as identified by the SAP, limits will be placed on the amount of development rights that can be transferred within any neighborhood to ensure a compact and integrated development form that has a population density to meet the requirements of a neighborhood school while providing for a diversity of housing types. The TDR limits established in the SAP do not create entitlements for their use within any particular development. The use of TDR credits is subject to approval by the Board of County Commissioners on a case by case basis.

In order to prevent urban sprawl and to be consistent with the residential densities provided for in Policy 6.1.3, the County will evaluate the effect of the TDR program upon the average minimum density at the development of fifty (50) percent of any one neighborhood, or by January 1, 2006 (whichever occurs first). If the TDR program has influenced the overall density in such a manner that may jeopardize the Village concepts, the County shall amend the TDR ordinance. The County shall also consider other incentives to promote higher densities.

6.1.11
(Added 6/95, Ord.#95-13
Amend. 5/97, Ord.#99-04
Amend. 5/01, Ord.#01-11)

AQUIFER RECHARGE

Prior to permitting any urban development on recharge soils, (as defined in accordance with the Orange County Land Development Code) an analysis shall be completed to insure that appropriate water recharge of the Floridan Aquifer can be maintained. The analysis must demonstrate that the recharge characteristics of water anticipated to enter the soil in the post development condition shall be comparable to that anticipated in the pre-development condition.

6.4.3
(Added 5/97, Ord.#97-07)

In order to enhance the effectiveness of proposed environmental corridors, the design of proposed major roadways shall take into account maintenance of natural hydrology and movement of wildlife as noted in the Ecological Summary Report and Appendix F thereof.

Housing Element

1.2.9
(Amend. 12/00, Ord.#00-25)

The County shall continue to monitor housing conditions in the County to detect and eliminate housing code violations through the Housing Code Enforcement Program.

1.5.5
(Amend. 12/00, Ord.#00-25)

Orange County shall establish a program to monitor the number of housing units attributable to new construction, conversions, mobile home replacements and removals.

Intergovernmental Coordination Element

1.1.12

Orange County shall attempt to establish County-wide regulations for wetlands and rare upland vegetative communities through the use of joint planning area agreements.

1.5.3
(Amend. 12/00, Ord.#00-25)

Orange County shall continue to support and assist the St. Johns River Water Management District in implementing the Water 2020 Plan and related studies. The plan will include guidelines regarding consumptive use, the effects of withdrawals from the Floridan Aquifer and alternative sources water.

1.5.4

Orange County will coordinate with the Water Management Districts, through written and verbal communications, and joint technical committees, to monitor the amount of groundwater pumped from the aquifer underlying the County and distributed for use outside the County and if necessary, assist in the emergency conservation of groundwater.

1.6.1
(Amend. 12/00, Ord.#00-25)

Orange County shall continue to support and assist the Water Management Districts in implementing the development of a County-wide consumptive use study program to monitor the effects of withdrawals from the Floridan Aquifer, through provision of information and technical assistance, and participation in joint meetings.

- 1.6.5
(Amend. 12/00, Ord.#00-25) Orange County shall continue to coordinate with all governmental entities to establish County-wide regulations for development within prime aquifer recharge areas.
- 1.8.4
(Amend. 12/00, Ord.#00-25) Orange County shall continue to identify and recommend to the State and the Water Management Districts environmentally sensitive lands, including but not limited to wetlands and floodplains that would warrant acquisition under the Conservation and Recreation Lands and the Save Our Rivers Programs.
- 1.8.5 Orange County shall, in conjunction with other appropriate agencies, such as the Water Management Districts, identify and prioritize for corrective measures problem floodplain areas through basin studies.
- 1.8.6 Orange County shall continue to coordinate with the Army Corps (Amend. 12/00, Ord.#00-25) of Engineers, the Florida Department of Environmental Protection, and the St. Johns River and South Florida Water Management Districts to identify and regulate wetland areas under their jurisdiction. This coordination shall include participation in joint committees, exchange of technical information, written and verbal communications, and attendance at appropriate public meetings.
- 1.8.9
(Amend. 12/00, ord.#00-25) Orange County shall continue efforts to establish Interlocal Agreements with adjacent counties and municipalities which protect wetlands, rare uplands, floodplains, habitat containing plants and wildlife listed as threatened, endangered, or species of special concern, and riverine corridors that are located in more than one jurisdiction.

Potable Water Element

- 2.2.4 Orange County shall coordinate with the Water Management Districts to monitor the amount of groundwater pumped from the aquifer underlying the County that is distributed for use outside the County; and, if necessary, assist in the emergency conservation of groundwater
- 2.2.5 Orange County shall encourage municipalities, counties, and private entities, which export water, underlying Orange County to utilize other sources of potable water and/or utilize water conservation measures. Such encouragement shall be by providing technical assistance and participating in studies conducted by the Water Management Districts.

Recreation Element

- 1.2.2 Orange County shall continue to investigate the acquisition of wetland, rare upland vegetative communities, and lands for wildlife and riverine corridors for incorporation into the environmentally sensitive lands program as resource-based parks.

Stormwater Management Element

GOAL 1 Orange County shall manage stormwater to prevent flood damage and protect water quality.

OBJECTIVE 1.1 Orange County shall minimize the occurrence of flooding that is a threat to human health or property. This objective shall be made measurable by implementing the following policies.

POLICIES

1.1.1 Orange County shall not approve for construction any road, street, or facility proposed to be constructed within a designated flood hazard area, unless mitigation measures as identified in the applicable regulations have been installed by the developer to overcome an identified flood hazard. All measures installed by the developer must be certified acceptable by the County prior to project completion. This policy shall be included in the floodplain regulations of the Land Development Code.

1.1.2 Orange County shall require stormwater management systems within all development to be designed and installed to provide adequate flood protection for all primary structures and to protect the structural integrity of all roadways.
(Amend. 12/00, Ord.#00-25)

1.1.3 Orange County shall require that all new stormwater management systems provide for the safe handling of all stormwater run-off that flows into, across, and is discharged from the site without creating any additional flooding to adjacent property owners.
(Amend. 12/00, Ord.#00-25)

1.1.4 Orange County shall have the authority to require the design of stormwater management systems to be compatible with those natural terrain or landscape barriers that protect the site against flooding.
(Amend. 12/00, Ord.#00-25)

1.1.5 Orange County shall require that retention/detention areas be designed and located so as to not adversely reduce the existing flood storage of the floodplain.
(Amend. 12/00, Ord.#00-25)

1.1.6 Orange County has established the flood elevations for all land-locked lakes within the basins for which stormwater master plans have been completed. Orange County shall continue to make progress in establishing flood elevations for the remaining area lakes through FEMA, localized studies and the remaining basin studies. Based upon new information, the County shall revise, as necessary, the minimum building pad elevations and modify existing land development regulations in the Land Development Code.
(Amend. 12/00, Ord.#00-25)

1.1.7

Orange County shall investigate reports of flooding in a timely manner. Response times, frequencies, durations, and locations shall be noted and reported annually to the Board of County Commissioners.

1.5.2
(Amend. 12/00, Ord.#00-25)

Orange County shall continue to ensure the stormwater management regulations, contained in the County Land Development Code, protect natural drainage features by requiring compensatory storage, restoration/ mitigation of wetlands, nonstructural techniques when feasible, erosion and sediment control, maintenance of natural hydroperiods, and maximization of on-site detention/retention.