CHAPTER 2 Watershed Description

2.1 OVERVIEW

The Lower Sweetwater Creek (LSC) watershed drains approximately 10.5 square miles of land located in northwest area of Hillsborough County, Florida. The Watershed is primarily subuLSCn, and drains into Old Tampa Bay. The watershed is generally bordered on the east by Armenia Avenue, on the west by Webb Road, on the north by Sligh Avenue and on the south by Tampa Bay Boulevard, Memorial Highway, and Old Tampa Bay. The watershed, shown in Figure 2-1, is composed of 272 smaller units or sub-basins ranging in size from approximately 0.6 to 249.2 acres. Topography varies from a high of 40 feet National Geodetic Vertical Datum (NGVD) in the northeast portion of the watershed near Egypt Lake to a lower near sea level to its outfall at the old Tampa Bay.

2.2 CLIMATE

The climate of the LSC, and for Hillsborough County as a whole, can be classified as humid subtropical. Annual average precipitation is around 50 inches and almost 60% of this total falls during the four-month rainy season that extends from June through September. This time frame coincides with the occurrence of most tropical storms and hurricanes and the conditions are ripe for regular, convective afternoon and evening thunderstorms. These summer events, which can be very localized, are highly variable in both intensity and volume. The larger, normal summer storm events and those associated with tropical systems can cause flooding problems in areas where there are deficiencies in existing stormwater systems.

Winter rainfalls is, historically, relatively light and is generally associated with the weak cold fronts that descend from the northern part of the country and travel south through the region. However, in late 1997 and early 1998, some of the largest rain events occurred in the winter months, and this is especially true in El Nino years.

The annual mean temperature in Hillsborough County is about 72 degree F (Fahrenheit). The mean monthly temperature ranges from a low of approximately 60 degree F in January to a high of approximately 82 degree F in August. Typically, summer temperature ranges from morning lows in the high 70's and low 80's to afternoon highs that routinely reach into the mid-90's, but rarely do they exceed 100 degree F. Summer humidity that ranges into the upper 90's can further exacerbate the situation. Conversely, typical winter low temperatures generally range above freezing into the 40's; only occasionally dropping into the low 20's and teens. High temperatures generally reach into the upper 60's or low 70's for most of the season, especially between passages of the cold fronts.

According to the National Weather Service in Ruskin, humidity does not vary as seasonally as temperature and rainfall. The Service keeps daily records for 1 and 7 o'clock A.M. and 1 and 7 o'clock P.M. The 7 A.M. time period generally records the highest humidity with the annual average at 88% with the 1 P.M. time period recording the lowest at an average of 58%.
Evapotranspiration rates vary, and limited data are available for analysis. Estimates of 39 inches per year have been reported. Viessman, et al. (1977) reports the figure to be closer to 48 inches

per year. Lake evaporation data often quoted for use in Hillsborough County are those reported from Lake Alfred in Polk County, supplemented by scattered data available from the Lake Padgett weather station. Studies conducted by Tampa Bay Water estimate the lake evaporation rate to average approximately 56 inches per year in the study area.

2.3 SOILS

Soil distribution by type is shown in Figure 2-2. This information was developed based on SCS Soil Survey with Geographical Information Systems (GIS) coverages developed by SWFWMD. Much useful information, such as drainage classification, percent slope, water table depth, permeability, natural vegetation and potential uses for development and agriculture, can be obtained by consulting the SCS Manual for Hillsborough County for each particular soil type.

These soil types can be arranged into four groups based on their runoff-potential; these types are shown in Figure 2-3. The hydrologic groups are commonly used in watershed planning to estimate infiltration rates and moisture capacity. Soil properties that influence the minimum rate of infiltration obtained for a bare soil after prolonged wetting are: a) depth to seasonally high water table, b) intake rate and permeability, and c) depth to a layer or layers that slow or impede water movement. The major soil hydrologic groups are:

- Group A (low runoff potential) soils have high infiltration rates and a high rate of water transmission even when thoroughly wetted. They have typical infiltration rates of 10 in./hr when dry and 0.50 in./hr when saturated. Soil types found in the LSC that fall into this group include the Candler fine sands, Orsino fine sand, and the Tavares-Millhopper fine sands.

- Group B (moderately runoff potential) soils have moderate infiltration rates when thoroughly wetted and a moderate rate of water transmission. They have typical infiltration rates of 8 in./hr when dry and 0.40 in./hr when saturated.

- Group C (moderately high runoff potential) soils have low infiltration rates when thoroughly wetted and a low rate of water transmission. They have typical infiltration rates of 5 in./hr when dry and 0.25 in./hr when saturated. Soil types found in the LSC that fall into this group includes Seffner fine sand, and Zolfo fine sand.

- Group D (high runoff potential) soils have very slow infiltration rates when thoroughly wetted and a very low rate of water transmission. They have typical infiltration rates of 3 in./hr when dry and 0. 10 in./hr when saturated. Soil types found in the LSC that fall within this group include Basinger, Holopaw and Samsula, Chobee muck.

- Dual classifications (e.g. A/D or B/D) can be assigned to soils that exhibit substantially different hydrologic characteristics during the wet and dry seasons. During the wet season, these soils become saturated throughout much of the soil column due to elevated water table conditions. Infiltration is thus impeded and the soils exhibit Group D infiltration and runoff

rates. During the dry season when the water levels recede, infiltration rates increase and runoff rates decline to Group A or Group B levels. Soil types that fall within the B/D classification found within the LSC are Chobee loamy fine sand, Felda fine sand, Floridana fine sand, Immokalee fine sand, Malabar fine sand, Myakka fine sand, Myakka-ULSCn land complex, Ona fine sand, St. Johns fine sand, Wabasso-ULSCn land complex and Winder fine sand.

Soils can also be classified as either hydric or non-hydric, which relates to whether the soils had wetland or upland origins, respectively. Those soils designated as hydric develop under anaerobic conditions in wetland areas and generally contain a large amount of organics, are poorly to very poorly drained or depressional in nature, and are associated with a high seasonal water table. Those soils, which are non-hydric, lack these characteristics and are associated with upland or transitional areas. Soil types with the hydric classification found within the LSC are Basinger, Holopaw and Samsula, Chobee loamy fine sand, Chobee muck, Eaton mucky sand, Felda fine sand, Floridana fine sand, Malabar fine sand, St. Johns fine sand and Winder fine sand. All of the other types would be considered non-hydric.

2.4 PHYSIOGRAPHY AND HYDROLOGY

The LSC lies within the Polk Upland physiographic unit as defined by White. This unit is part of the Central or Mid-Peninsular physiographic zone, one of three in Florida. This zone is characterized by discontinuous highlands formed by sub-parallel ridges that are separated by broad valleys. Land elevation in the LSC varies between 40 feet NGVD in the northeast portion of the watershed to near sea level at the Old Tampa Bay. These elevations are shown on Figure 2-4. The watershed has 3 major outfalls. These include the Peppermound Creek System, Low Sweetwater Creek System and Channel G of Sweetwater Creek for Thompson Lateral. Surface flows are generally from the northeast to the southwest toward the Lower Sweetwater Creek outfall. Hydrologically, surface flows originate for the most part through stormwater runoff with some influence from groundwater flows from lake seepage.

2.5 EXISTING AND FUTURE LAND USE

Existing Land Uses

As stated previously, the LSC encompasses a wide variety of land uses. The Southwest Florida Water Management District's 1999 Land Use/Land Cover Map is shown in Figure 2-5. The majority of these residential areas tend to be older subdivisions with little or no stormwater treatment being provided.

TABLE 2-1
EXISTING LAND USES (1999) - LOWER SWEETWATER CREEK WATERSHED

FLUCCSCODE	LAND USE CATEGORY	TOTAL ACREAGE	PERCENT OF TOTAL
1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS	34.336	**0.51**
1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT	29.148	**0.43**
1300	RESIDENTIAL HIGH DENSITY	2550.571	**37.89**
1400	COMMERCIAL AND SERVICES	1110.127	**16.49**
1500	INDUSTRIAL	811.65	**12.06**
1700	INSTITUTIONAL	320.2	**4.76**
1800	RECREATIONAL	196.804	**2.92**
1900	OPEN LAND	305.357	**4.54**
2200	TREE CROPS	0.756	**0.01**
4110	PINE FLATWOODS	74.507	**1.11**
4340	HARDWOOD CONIFER MIXED	142.127	**2.11**
5100	STREAMS AND WATERWAYS	13.850	**0.21**
5200	LAKES	66.327	**0.99**
5300	RESERVOIRS	62.762	**0.93**
5400	BAYS AND ESTUARIES	23.283	**0.35**
6100	WETLAND HARDWOOD FORESTS	7.596	**0.11**
6150	STREAM AND LAKE SWAMPS (BOTTOMLAND)	14.688	**0.22**
6210	CYPRESS	2.099	**0.03**
6300	WETLAND FORESTED MIXED	103.475	**1.54**
6410	FRESHWATER MARSHES	23.467	**0.35**
6430	WET PRAIRIES	23.538	**0.35**
6440	EMERGENT AQUATIC VEGETATION	4.807	**0.07**
6530	INTERMITTENT PONDS	2.46	**0.04**
8100	TRANSPORTATION	796.518	**11.83**
8300	UTILITIES	11.836	**0.18**
		6732.289	**100.00**

Future Land Uses

Due to the highly urbanized and developed areas in the LSC, there are not many changes in land use predicted and planed by the Hillsborough County Comprehensive Plan as shown in Figure 2-6.