



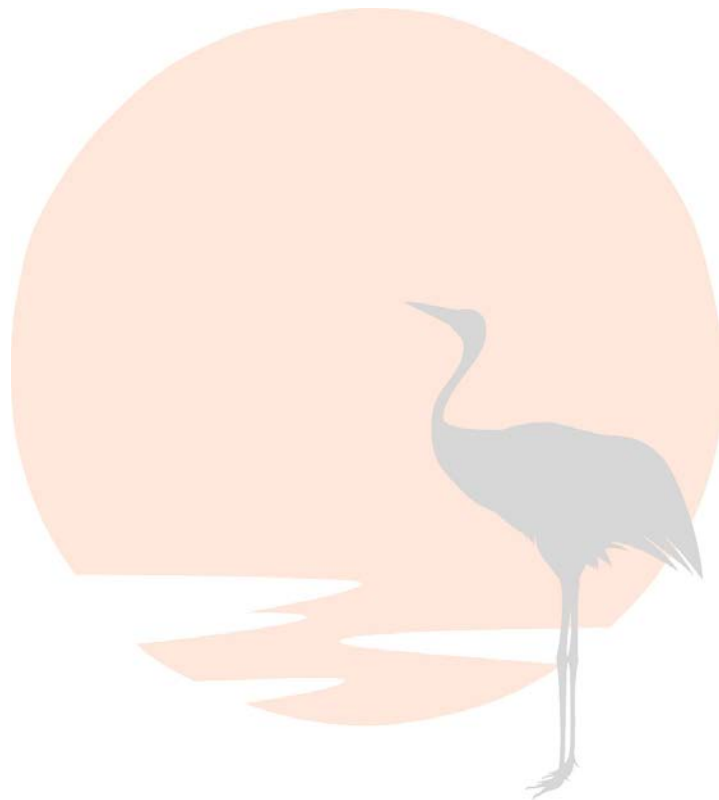
Lemon Bay

WATERSHED MANAGEMENT PLAN



Chapter 1

Project Background and Physical Setting



August 2010



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1.0 PROJECT BACKGROUND AND PHYSICAL SETTING

1.1 BACKGROUND

Sarasota County has six major watersheds in the County: Sarasota Bay, Roberts Bay North, Little Sarasota Bay, Dona and Roberts Bay, Lemon Bay, and the Myakka River. Sarasota County has implemented the Comprehensive Watershed Management Program to address water quality, water quantity, flooding, and natural resources in a holistic manner within each of these watersheds. This program employs an approach consistent with the Southwest Florida Water Management District's (SWFWMD) areas of responsibilities related to water resource management: Natural Systems, Water Quality, Water Supply, and Flood Protection.

The County and SWFWMD are partnering to develop a Watershed Management Plan (WMP) for Lemon Bay, which is an estuary of national significance, as well as a SWFWMD Surface Water Improvement and Management (SWIM) Priority waterbody. Funding is being provided by the Manasota Basin Board. Inclusion of proposed projects, corrective actions, best management practices (BMPs), etc. in the plans does not confer any special status, approval, permitting standing or funding from the District. All proposed projects are subject to regulatory review and permitting. Requests for funding assistance will have to meet the requirements of funding programs and subject to the District's Governing and Basin Boards appropriating funds.

1.2 PURPOSE AND OBJECTIVE

The Lemon Bay WMP is a regional initiative that promotes and furthers the implementation of the *Sarasota County Comprehensive Plan*, the Charlotte Harbor National Estuary Program's (CHNEP) *Comprehensive Conservation and Management Plan (CCMP)*, SWFWMD's *Southern Coastal Watershed Comprehensive Watershed Management Plan*, and the *Lemon Bay Interagency Comprehensive Watershed Management Plan*. The purpose of this initiative is to develop and implement a watershed management plan for Lemon Bay and its watershed to achieve the following objectives:

1. Improve and protect existing water quality.
2. Help develop Basin Management Action Plans (BMAPs) prepared by the Florida Department of Environmental Protection (FDEP) to address adopted Total Maximum Daily Load (TMDL) issues within the Lemon Bay watershed.
3. Identify and provide a more natural hydrologic regime for Lemon Bay and the watershed.
4. Protect existing and future property owners from flood damage.
5. Develop ecosystem goals and targets based on the needs of environmental and biological indicators.



6. Investigate potential sustainable surface water supply options that are consistent with and support objectives from the Sarasota County Comprehensive Plan, the Regional Water Supply Plan, and the Southern Water Use Caution Area Plan.

Sarasota County has embarked on a proactive approach to develop the proper science and community-based vision as a foundation for formulating, evaluating, prioritizing, and implementing watershed management actions. Toward this goal, the Environmental Sensitive Lands Protection Program (ESLPP) has acquired lands including portions of the Lemon Bay Preserve, Lemon Bay Park Addition, Manasota Scrub Preserve, and the Ainger Creek Watershed, which are strategically located in the watershed.

The following sections summarize the physical and societal characteristics of the Lemon Bay watershed.

1.3 WATERSHED

1.3.1 Political Jurisdictions

The Lemon Bay watershed is regulated by FDEP, SWFWMD, two counties (Sarasota and Charlotte), and two local municipalities (Cities of Venice and North Port). Table 1-1 gives the acreage breakdown for each jurisdiction, and Figure 1-1 shows the political boundaries. It is important for all regulatory agencies within a watershed to coordinate their efforts to provide a comprehensive evaluation of the drainage system.

Each regulatory agency is responsible for the health of the bay and has the ability to regulate specific activities throughout the watershed boundary. In general, State regulations are to be followed, unless one of the counties has adopted a more stringent rule; the same policy applies to cities within a county boundary. The more stringent regulations always take precedence.

Although each agency is responsible for the health of the bay, each agency's level of responsibility varies by the level of the agency's governing body. At the county level, Sarasota and Charlotte Counties' responsibilities include:

- ❖ Teaching their citizens what they can do to improve the health of the watershed.
- ❖ Funding and implementing projects to improve water quality, water supply, natural systems, and flood protection.
- ❖ Researching new methods and practices for watershed management.
- ❖ Enforcing existing ordinances and passing additional ordinances to lessen the impacts caused by new developments.



Table 1-1 Political Jurisdiction Acreage

| | Alligator | | Woodmere | | Forked | | Gottfried | | Ainger | | Coastal | | Totals | |
|-----------------------------------------------|-----------|-------|----------|-------|--------|-------|-----------|-------|--------|-------|---------|-------|--------|-------|
| | Ac | % | Ac | % | Ac | % | Ac | % | Ac | % | Ac | % | Ac | % |
| Total | 6,799 | 14.3 | 1,475 | 3.1 | 5,863 | 12.3 | 7,222 | 15.1 | 6,646 | 13.9 | 19,676 | 41.3 | 47,681 | 100.0 |
| Lemon Bay Watershed Acreage by County | | | | | | | | | | | | | | |
| Sarasota | 6,799 | 100.0 | 1,475 | 100.0 | 5,863 | 100.0 | 7,038 | 97.5 | 5,560 | 83.7 | 5,574 | 28.3 | 32,308 | 67.8 |
| Charlotte | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 184 | 2.5 | 1,087 | 16.3 | 14,102 | 71.7 | 15,372 | 32.2 |
| County Total | 6,799 | 100.0 | 1,475 | 100.0 | 5,863 | 100.0 | 7,222 | 100.0 | 6,646 | 100.0 | 19,676 | 100.0 | 47,681 | 100.0 |
| Lemon Bay Watershed Acreage by City | | | | | | | | | | | | | | |
| North Port | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 69 | 0.4 | 69 | 0.1 |
| Venice | 0 | 0.0 | 0 | 0.0 | 674 | 3.4 | 528 | 2.7 | 3,339 | 17.0 | 1,322 | 6.7 | 5,863 | 12.3 |
| City Total | 0 | 0.0 | 0 | 0.0 | 674 | 3.4 | 528 | 2.7 | 3,339 | 17.0 | 1,391 | 7.1 | 5,932 | 12.4 |
| Lemon Bay Watershed Acreage by Water District | | | | | | | | | | | | | | |
| SWFWMD | 6,799 | 100.0 | 1,475 | 100.0 | 5,863 | 100.0 | 7,222 | 100.0 | 6,646 | 100.0 | 19,676 | 100.0 | 47,681 | 100.0 |

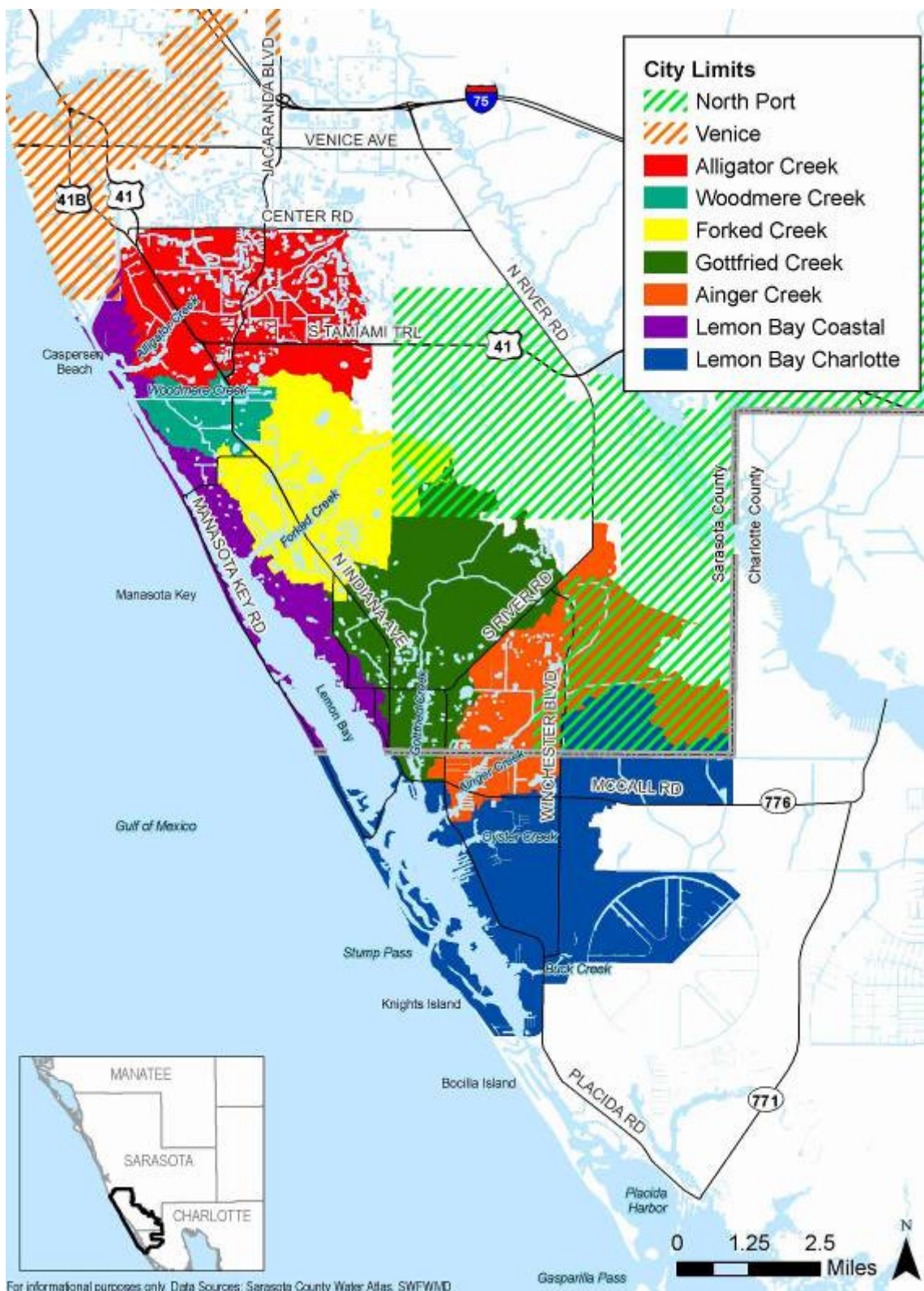


Figure 1-1 Lemon Bay Basins and Political Jurisdictions



This WMP discusses the goals and objectives for Sarasota County and the measures the County is taking to meet these goals. Although not a participant in this plan, Charlotte County is also undertaking measures to meet similar goals for Lemon Bay.

1.3.2 Boundary

The Lemon Bay watershed includes Lemon Bay, the Alligator Creek basin (6,799 acres), the Woodmere Creek basin (1,475 acres), the Forked Creek basin (5,863 acres), the Gottfried Creek Basin (7,222 acres), the Ainger Creek Basin (6,646 acres), the Lemon Bay Sarasota County Coastal area (5,574 acres), and the Lemon Bay Charlotte County area (14,102 acres).

Figure 1-1 outlines the current geographic watershed and basin boundaries. The watershed is generally bounded by Placido Harbor to the south, the City of Venice to the north, and the City of North Port to the east.

Most of the 47,681-acre watershed is in Sarasota County. However, approximately 32% is in Charlotte County (Table 1-1). Lemon Bay has seven major tributaries that connect to the Bay: Alligator, Woodmere, Forked, Gottfried, Ainger, Oyster, and Buck Creeks. The Alligator, Woodmere, and Forked creeks and their drainage basins are in Sarasota County. The Gottfried, Ainger, and Oyster Creek basins span Sarasota and Charlotte Counties. The mouths of all three creeks are in the Charlotte County portion of the bay; however, most of the drainage basin for Gottfried and Ainger Creeks and a small portion of the drainage basin for Oyster Creek are in Sarasota County. Buck Creek and its drainage basin are in Charlotte County (Table 1-1). This WMP focuses on the five creeks and their drainage basins in the Sarasota County portion of the Lemon Bay watershed.

Presently, more than half of the Lemon Bay watershed is non-urbanized; however, the remaining portions have been impacted by anthropogenic activities. Impacts include degradation to water quality from stormwater runoff, point source discharges, and septic systems; alterations to surface water hydrology from channelization of natural streams and increased imperviousness; reduction of surface water storage; and conversion of natural habitat to agriculture and urban land uses.

Historical maps and surveys suggest that the five Sarasota County tributaries to Lemon Bay were tidal creeks, which did not extend significantly inland in the watershed. Historically, Alligator Creek appears to have been a tidal creek leading to an extended slough system upstream of the present day US 41 (Jones, 2007). These naturally occurring tidal creeks were significantly altered by ditching for mosquito control and development activities.

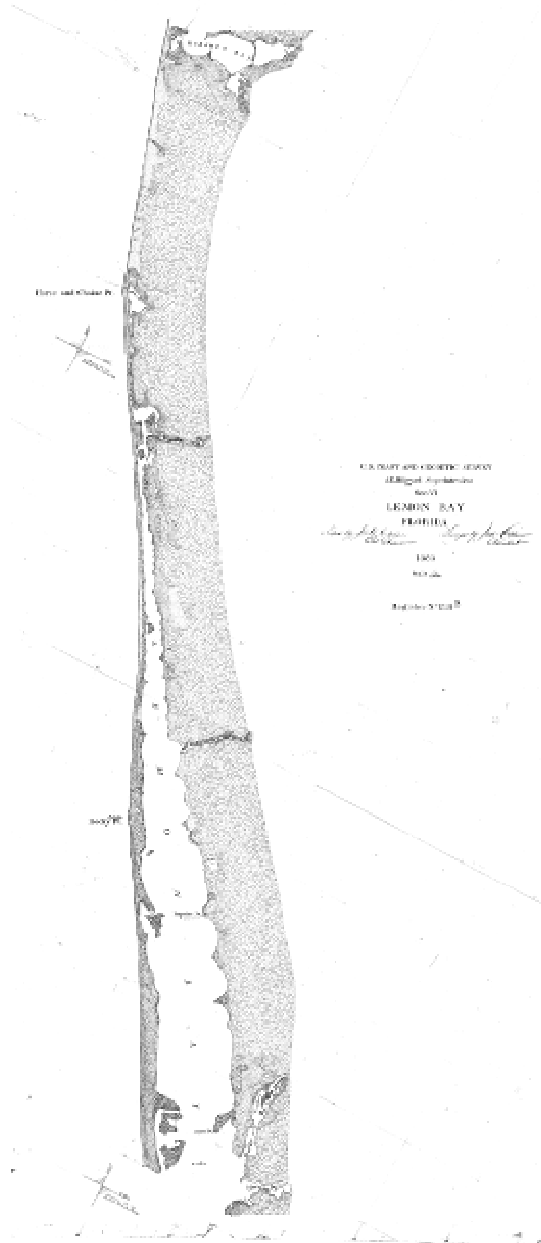


Figure 1-2 Lemon Bay 1883 U.S. Coast and Geodetic Survey

1.3.3 Topography

The Lemon Bay watershed is relatively flat and ranges in elevation from sea level in the west along the barrier islands and coast to a maximum of approximately 30 feet NGVD at the northernmost inland portion of the Lemon Bay Coastal basin (Figure 1-3). The average slope of the watershed land surface ranges from approximately 0.001 foot/foot in the south to 0.002 foot/foot in the north. The barrier islands are low lying and do not exceed 5 feet NGVD throughout.

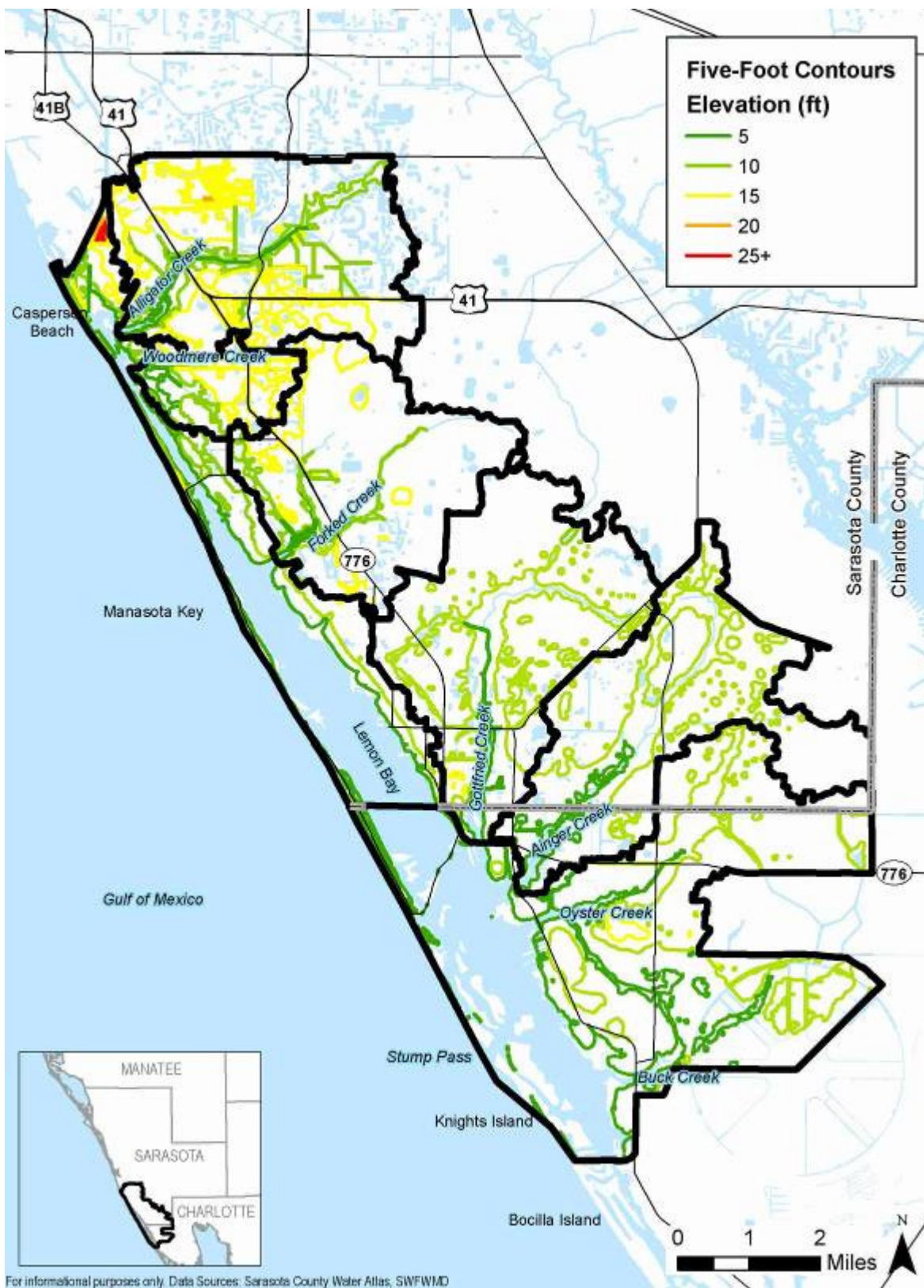


Figure 1-3 Lemon Bay Watershed Topography



1.3.4 Physiographic Region

The Lemon Bay watershed lies entirely within the Southern Gulf Coastal Lowlands subdivision of the mid-peninsular physiographic region of Florida (White, 1970; SWFWMD, 2000). The Gulf Coastal Lowlands is a broad, gently sloping marine plain characterized by broad flatlands with many sloughs and swampy areas (Figure 1-4) (White, 1970). Some of these areas have been drained by ditches and canals, especially near to the coast.

1.3.5 Surface Hydrology

Rainfall and surface water runoff are critical to maintaining the natural resources of any estuarine system and its supporting watershed. Sarasota County's surface water hydrologic setting includes an average annual rainfall of 52 inches, although this can vary significantly from year to year. Intra-annual variability is also high, with about 60% of a typical annual rainfall occurring during the wet season months of June through September.

Land surveys from the mid 1800s show that Lemon Bay's coastal creeks and streams did not extend significantly inland from the estuaries and bays. Analysis of the Sarasota County 1847 General Land Office Survey (Figure 1-5) indicates that the inland extent of Forked Creek ended in the general vicinity of the current SR 776. The 1958 NRCS Soil Survey Map (Figure 1-6) supports this, as the map shows bands of moderately drained soils associated with scrub flatwoods at the historical extent of the creeks. It is evident from these surveys that the Lemon Bay watershed was historically a collection of isolated wetlands and pine flatwoods. This land condition allowed excess water in the wetlands to flow into the pine flatwoods during the cyclical wet season. The creeks likely acted as tidal extensions, receiving minimal fresh water inflows even through the wet season.

Widespread alterations to the surface hydrology of the watershed have occurred over the past decades, resulting in significant changes to the volume and timing of freshwater inflows to the bay.

Gottfried and Ainger Creeks were more defined creek systems on the soils maps. Gottfried Creek was labeled as Deer Creek and is shown as a perennial stream from Lemon Bay to approximately 2,500 feet upstream of Dearborn Street, where it changed to an intermittent stream for a short segment and then was ditched to the north and west. Ainger Creek extended from Lemon Bay upstream approximately 15,000 feet as a perennial stream before transitioning to a slough system

Early residents of the Lemon Bay watershed were plagued by mosquitoes. To alleviate the problem, many ditches were created in the coastal mangroves to extend the natural creeks inland and to connect many of the larger isolated wetlands to the creeks. In addition, many wetlands were filled and impervious surfaces were created to accommodate development.

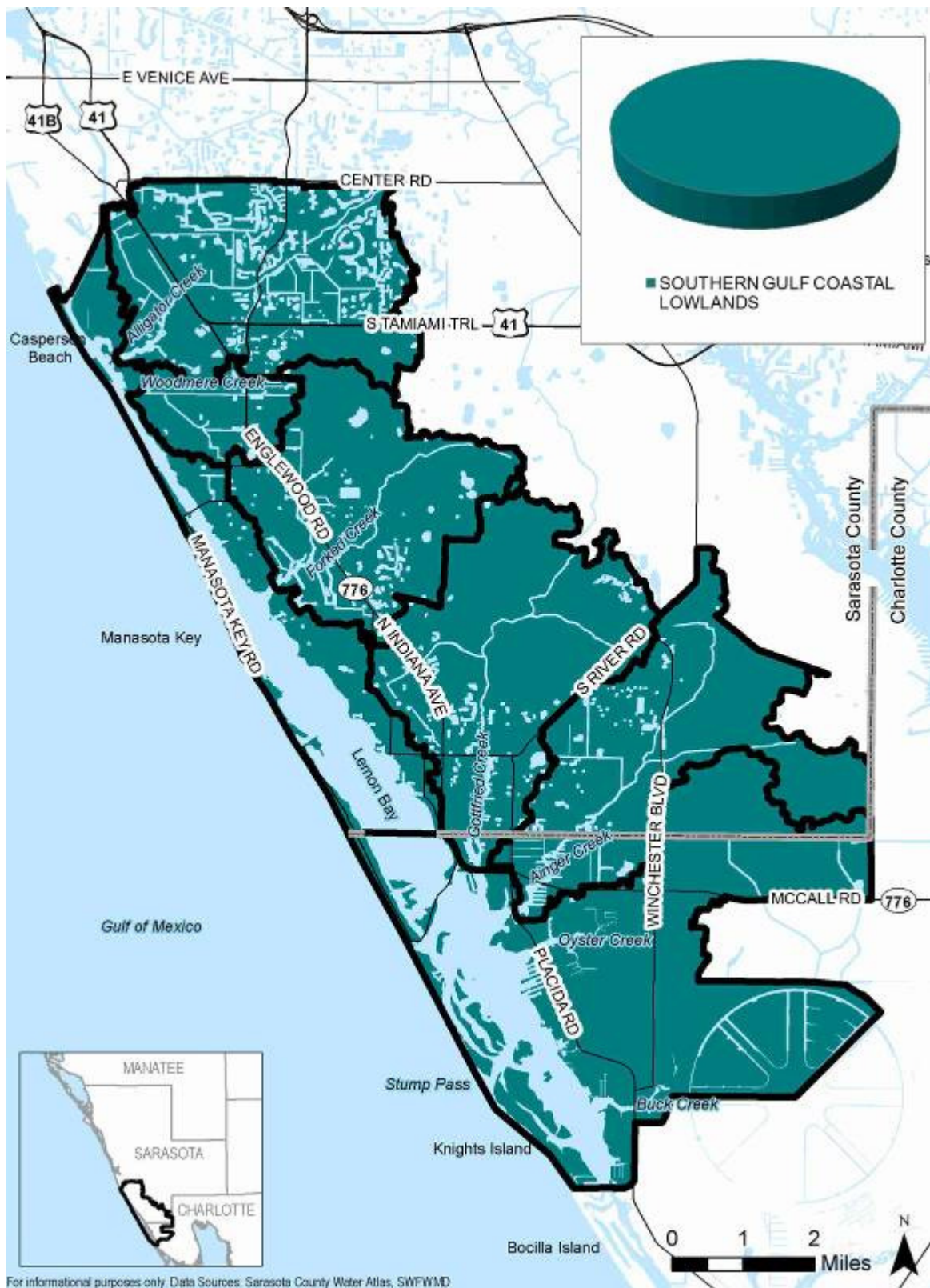


Figure 1-4 Lemon Bay Watershed Physiographic Region



Figure 1-5 1847 Survey (General Land Office Township plat, georeferenced by Sarasota County Division of Watershed Management, 2004)

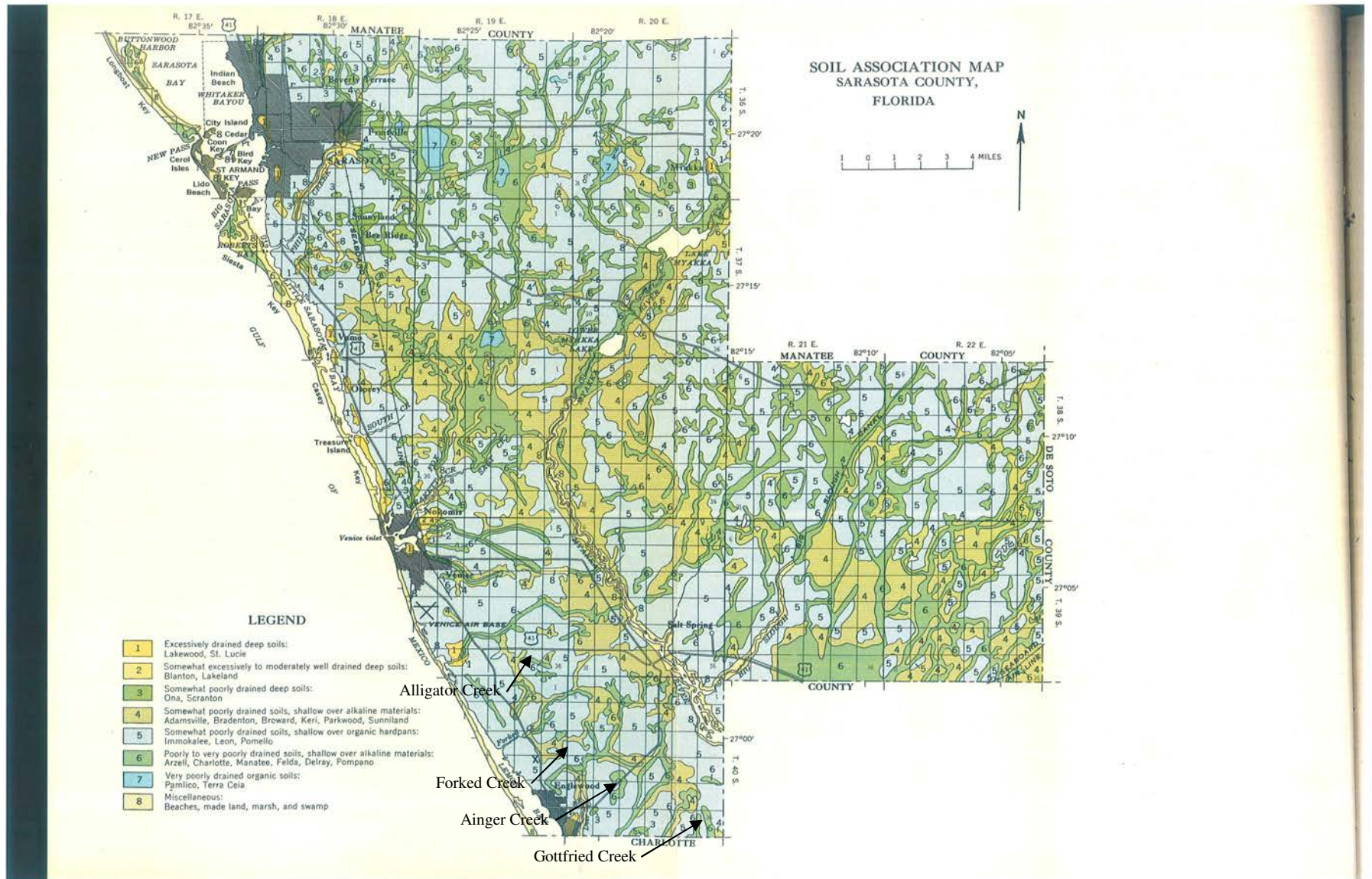


Figure 1-6 1958 Soil Maps (Maps Constructed in 1958 from 1950-53 Soil Surveys and 1948 Aerial Photographs)



Table 1-2 summarizes the current geographic watershed and basin areas for the Sarasota County portion of the watershed. The Lemon Bay Coastal basin flows to Lemon Bay via overland flow and small conveyance channels. Each of the other basin areas discharges to Lemon Bay through a well-defined channel. Sarasota County further delineated the basin into subbasins with the Advanced Interconnected Channel and Pond Routing Model (ICPR) for the Alligator Creek, Woodmere Creek, Forked Creek, Gottfried Creek, and Ainger Creek Basins (Figure 1-7). Basins were not delineated for the Charlotte County portion of the Lemon Bay watershed for this project.

| Basin | Basin Area (ac) | Percent of watershed |
|-------------------|-----------------|----------------------|
| Alligator Creek | 6,799 | 20.2% |
| Woodmere Creek | 1,475 | 4.4% |
| Forked Creek | 5,863 | 17.5% |
| Gottfried Creek | 7,222 | 21.5% |
| Ainger Creek | 6,646 | 19.8% |
| Lemon Bay Coastal | 5,574 | 16.6% |
| Total | 33,579 | 100.0% |

Hydrologic alterations within the Lemon Bay watershed include:

- ❖ Reducing on-site rainfall storage by filling and ditching natural depressions and wetlands.
- ❖ Increasing stormwater runoff rates by channelizing natural streams and creating networks of interconnected ditches that flow to the bay.
- ❖ Reducing infiltration by introducing pavement and other impervious surfaces.
- ❖ Altering flow patterns by constructing water control weirs and increasing sedimentation in the channel from upland erosion.

1.3.6 Geology and Hydrogeology

Hydrogeologic features of the watershed include the surficial, intermediate, and Floridan aquifers (Figure 1-8 and Figure 1-9). The *surficial aquifer* is an unconfined system that overlies the intermediate aquifer system and ranges in thickness from a few feet to over 60 feet in the study area. Hydraulic properties of the surficial aquifer system determined from aquifer tests, laboratory tests, and model simulations vary considerably across the study area (Barr, 1996).

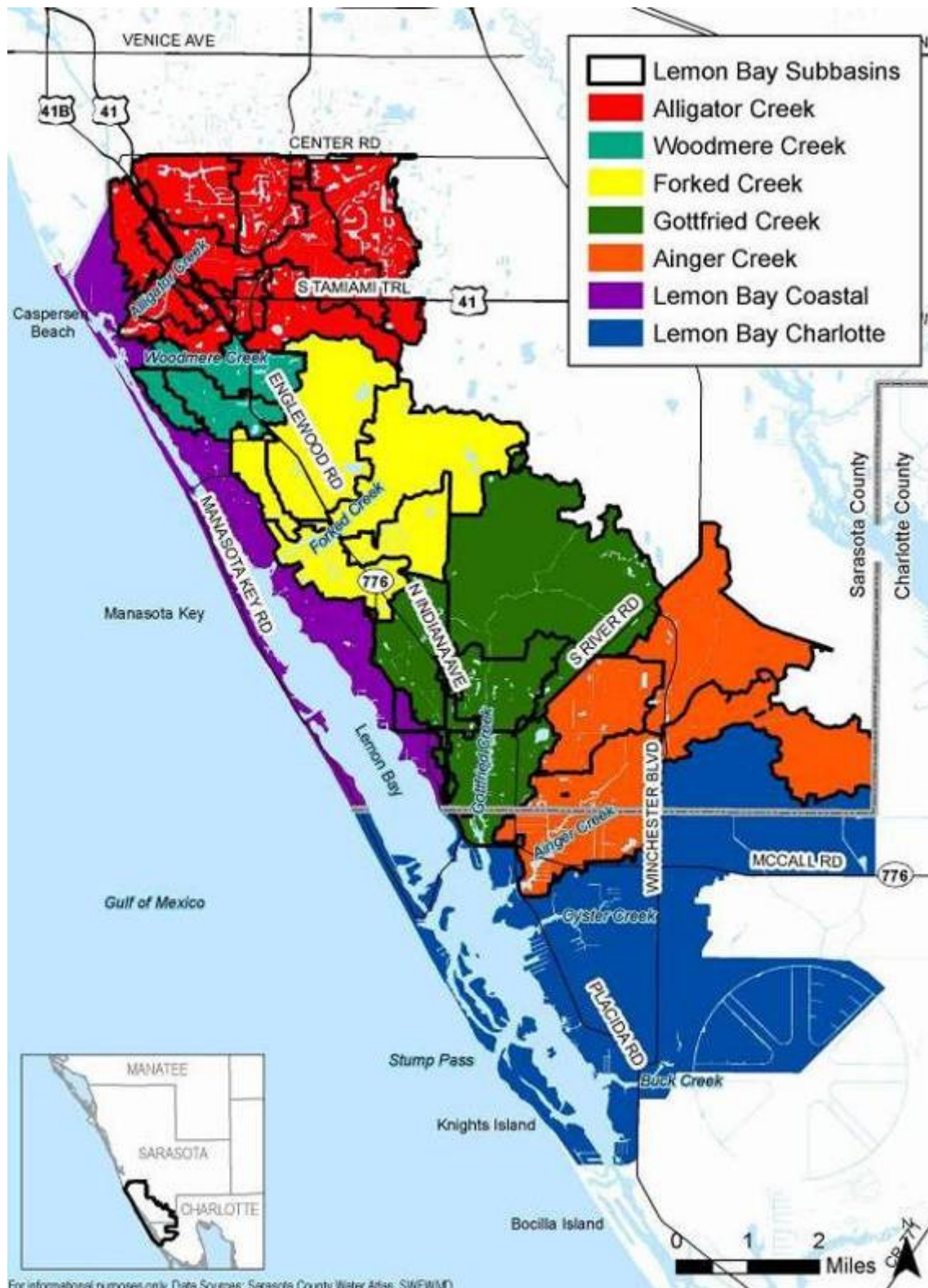


Figure 1-7 ICPR Catchment Delineation for Lemon Bay Basins in Sarasota County

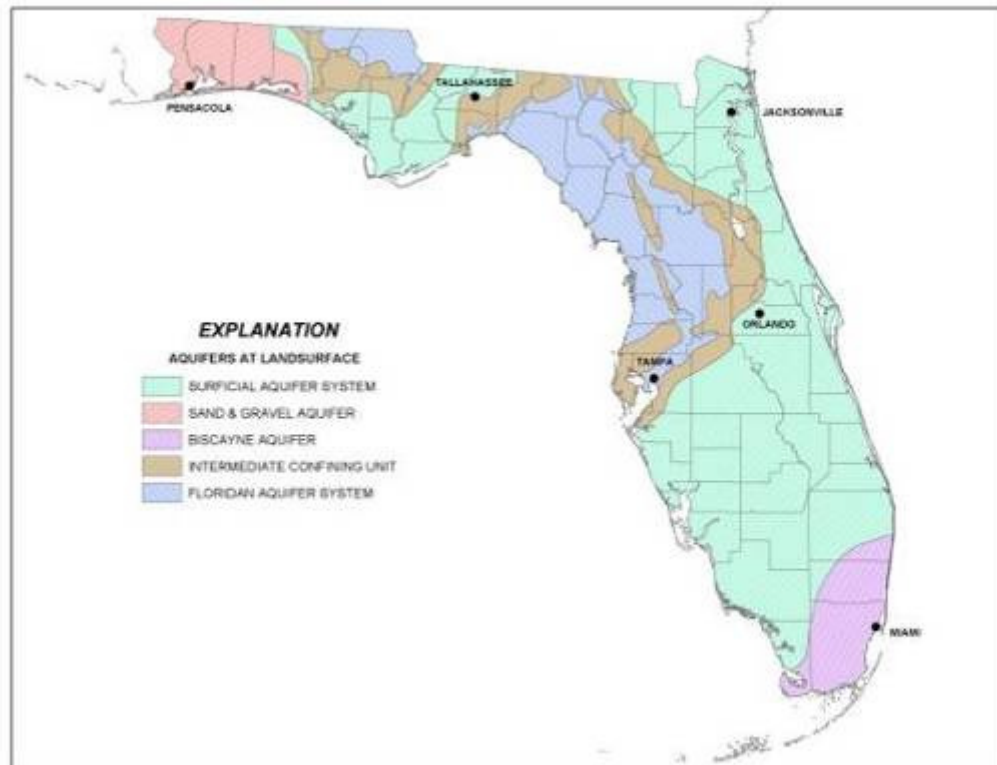


Figure 1-8 Aquifers at Land Surface (FDEP)

| System | Series | Stratigraphic unit | General lithology | Hydrogeologic unit ¹ | |
|------------|--------------------------|-----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------------|-----------------------------|
| Quaternary | Holocene and Pleistocene | Unconsolidated to weakly indurated clastics and marine deposits | Fine to medium quartz and phosphatic sand, clayey sand, limestone, clay, and shells | Surficial aquifer | Surficial aquifer system |
| | | Undifferentiated deposits Tamiami Formation | Fossiliferous limestone and dolostone, clay, quartz and phosphatic sand, and sandy, calcareous clay | Permeable Zone 1 confining unit Venice Clay | Intermediate aquifer system |
| Tertiary | Miocene | Hawthorn Group ^{2,3} | Fossiliferous limestone and dolostone, quartz and phosphatic sand, and clay | Permeable Zone 2 confining unit | |
| | | | | Tampa Member Nocatee Member ³ | Permeable Zone 3 |
| | Upper Oligocene | Suwannee Limestone ³ | Fossiliferous limestone and dolostone, some clay and quartz sand; some traces of phosphate near top | Upper Floridan aquifer | |

Figure 1-9 Hydrogeologic Framework and Intermediate Aquifer System in Sarasota and Adjacent Counties, Florida (from Barr, 1996)



The *intermediate aquifer system* is a confined aquifer system between the surficial and the Upper Floridan aquifers and is composed of alternating confining units and permeable zones. The intermediate aquifer system has three major permeable zones that exhibit a wide range of hydraulic properties. Horizontal flow in the intermediate aquifer system is northeast to southwest. Most of the study area is in a discharge area of the intermediate aquifer system, meaning that water pressure is higher at lower elevations, causing net upwards flow of groundwater (Barr, 1996).

Under natural conditions shallow groundwater quality ranges from fresh in the surficial aquifer system and upper permeable zones of the intermediate aquifer system to moderately saline in the lower intermediate aquifer. Water quality data collected in coastal southwest Sarasota County indicate that groundwater withdrawals from major pumping centers have resulted in lateral seawater intrusion and upconing into the surficial and intermediate aquifer systems (Barr, 1996).

The intermediate aquifer system is underlain by the Upper Floridan aquifer, which consists of a thick, stratified sequence of limestone and dolomite. The Upper Floridan aquifer is the most productive aquifer in the study area; however, its use is generally restricted because of poor water quality. Interbedded clays and fine-grained clastics separate the aquifer systems and permeable zones (Torres et al., 2001).

1.3.7 Soils and Sediment

The subsurface geology and subsurface features of Lemon Bay and its watershed are directly related to historic sea level fluctuations. The underlying geologic formations developed as the result of physical, chemical, and biological processes. These processes included near-shore deposition of sediment, precipitation of chemicals directly from seawater, and accumulation of the skeletal remains of marine organisms. These geologic formations range in age from the Oligocene epoch (38 to 22.5 million years ago) to the Holocene epoch (10,000 years ago to present) (Sarasota County Planning and Development Services, 2007, p. 2-9).

Surface and near-surface sediments consist of quartz sand, consolidated and unconsolidated shell beds, clays, limestone, and dolomite. Stratified layers of relatively pure limestones and phosphatic clays (clays rich in phosphate, salts of phosphoric acid) developed gradually in the watershed. Quartz sands that eroded from exposed higher land were also deposited. These near-surface sediments, which occur within approximately 1,500 feet of ground elevation, were of major importance to settlement because of their capacity to store and/or contain potable water. In addition to supplying water, the marine sediments provide phosphate and other mineral resources (Sarasota County Planning and Development Services, 2007, p. 2-9).

Much of the “soils” in the watershed, generally described as surficial sediments, represent only slightly weathered parent material, or modern sediments, some of which are still being formed, rather than layers of mixed mineral and organic materials. The soil types in the watershed



include limestone rock, calcareous muds (marls), sands (marine terraces), organic materials (peats and muck), and mixed solids (Duever et al., 1979; SWFWMD, 1980).

An additional substrate is made up of altered or Arent soils, e.g., dredge and fill, shell mounds, and landfills (Herwitz, 1977). Examples are the inland and coastal artificially constructed canals. Modification of natural tidal tributaries to finger canals is prevalent in developments. There is a shift away from autochthonous (local) sediment production in the natural waterways to a primarily allochthonous (transported) source of sediments in the canal system. Marls and sand marls generally range from 6 inches to 3 feet in depth, have low relief, and because of low water permeability are often wet (SWFWMD, 1980).

Each individual soil can be classified into a hydrologic soil group (HSG) based on its runoff producing characteristics. The most important of these characteristics is the inherent capacity of the soil to permit infiltration when bare of vegetation.

The four major hydrologic soil groups are:

- ❖ **Group A** (low runoff potential)—Soils with high infiltration rates even when thoroughly wetted. The soils are composed primarily of sands and gravel that are deep and well to excessively drained. These soils have a high rate of water transmission. Minimum infiltration rate = 0.30-0.45 inch/hour.
- ❖ **Group B** (low to moderate runoff potential)—Soils with moderate infiltration rates when thoroughly wetted. The soils are typically moderately fine to moderately coarse in texture and have a moderate rate of water transmission. Minimum infiltration rate = 0.15-0.30 inch/hour.
- ❖ **Group C** (moderate to high runoff potential)—Soils with slow infiltration rates when thoroughly wetted, often with a layer of soil that impedes the downward movement of water. The soils typically have a moderately fine to fine texture and a slow rate of water transmission. Minimum infiltration rate = 0.05-0.15 inch/hour.
- ❖ **Group D** (high runoff potential)—Soils with very slow infiltration rates when thoroughly wetted. The soils are primarily clay soils with a high permanent water table or shallow soils over nearly impervious materials, such as a clay pan or clay layer. These soils have a very slow rate of water transmission. Minimum infiltration rate = 0.0-0.05 inch/hour.

Some soils are assigned to two soil groups (e.g., A/D) if part of the area is artificially drained and another part is undrained. The distribution of HSGs for the study area is mapped in Figure 1-10. Only 1% of the soils in the watershed are classified as very well-drained to well drained (HSG A and B), while 25% are classified as poorly to very poorly drained (HSG C or D) (Table 1-3).



Nearly 60% of the soils are well-drained much of the year but during the wet season are poorly drained due to the high water table.



Figure 1-10 Soil Hydrologic Groups (1959 NRCS)



Table 1-3 Hydrologic Soil Groups (1959 NRCS)

| HSG | Percent of Basin | | | | | | | | | | | | Lemon Bay Watershed | |
|-----|------------------|---------|----------|---------|---------|---------|-----------|---------|---------|---------|---------|---------|---------------------|---------|
| | Alligator | | Woodmere | | Forked | | Gottfried | | Ainger | | Coastal | | | |
| | Acres | Percent | Acres | Percent | Acres | Percent | Acres | Percent | Acres | Percent | Acres | Percent | Acres | Percent |
| A | 214.8 | 3.2 | 21.4 | 1.5 | 21.3 | 0.4 | 183.3 | 2.5 | 12.1 | 0.2 | 230.5 | 1.2 | 683.5 | 1 |
| B | 0.0 | 0.0 | 0.0 | 0.0 | 3,909.5 | 66.7 | 0.0 | 0.0 | 16.0 | 0.2 | 3.1 | 0.0 | 3,928.6 | 8 |
| B/D | 5,023.5 | 74.0 | 896.2 | 60.8 | 379.0 | 6.5 | 4,687.4 | 65.0 | 4,664.1 | 70.2 | 9,003.9 | 45.6 | 24,654.1 | 52 |
| C | 196.8 | 2.9 | 201.3 | 13.7 | 154.3 | 2.6 | 519.5 | 7.2 | 44.1 | 0.7 | 3,196.4 | 16.2 | 4,312.4 | 9 |
| C/D | 13.0 | 0.2 | 0.0 | 0.0 | 1,267.1 | 21.6 | 311.5 | 4.3 | 330.9 | 5.0 | 75.0 | 0.4 | 1,997.5 | 4 |
| D | 1,025.1 | 15.1 | 336.3 | 22.8 | 6.5 | 0.1 | 1,362.6 | 18.9 | 1,417.7 | 21.4 | 1,526.5 | 7.7 | 5,674.8 | 12 |
| W | 315.7 | 4.7 | 19.5 | 1.3 | 124.7 | 2.1 | 144.3 | 2.0 | 153.9 | 2.3 | 5,698.6 | 28.9 | 6,456.8 | 14 |



1.3.8 Land Use

Land use characteristics of a watershed significantly affect water quality, habitat, and flooding risk. The following describes historical, current, and projected future land use in the Sarasota County portion of the Lemon Bay watershed.

1.3.8.1 Historical

Historical land use within the Lemon Bay watershed was estimated from the USDA 1948 aerials (Figure 1-12) and the NRCS 1959 Soil Survey. Areas identified as major waterways, intensive agriculture (row crops, groves, etc.), or urban were digitized from the aerials. HSG C/D, D, W, and Pineda Fine sand of B/D—which were not previously classified as major waterways, intensive agriculture or urban and built-up—were then classified as wetlands. Depressional wetlands not previously identified as such were then digitized from the aerials. The remainder of the watershed was classified as undeveloped uplands as shown in Figure 1-11 and Table 1-4. Aerial interpretation was not performed for the southeastern portion of the watershed, as historical aerials for a portion of Charlotte County were not available. Although the current watershed boundary was used for the historical analysis, that boundary may have changed from past conditions.

1.3.8.2 Current

The spatial distribution and acreage of different current land use categories were identified using SWFWMD's 2004 land use coverage contained in the District's geographic information system (GIS) library. SWFWMD land use data are based on the Florida Department of Transportation (FDOT) "Florida Land Use and Cover Classification System" (FLUCCS). These FLUCCS classes were aggregated into categories based on hydraulic and hydrologic characteristics (Table 1-5). The predominant land use in the watershed is forest, open area, and park, which comprises over 30% of the watershed. Current land use coverage is shown in Figure 1-13 and listed in Table 1-6.

The Lemon Bay watershed was essentially undeveloped in 1948. By 2004, over 30% of the watershed was built up. On the other hand, the total area of forest, open area, and parks decreased from almost 70% of the watershed to approximately 30%. Wetland coverage in the watershed decreased by almost half. Table 1-7 and Figure 1-15 show the historical to current change in land use.

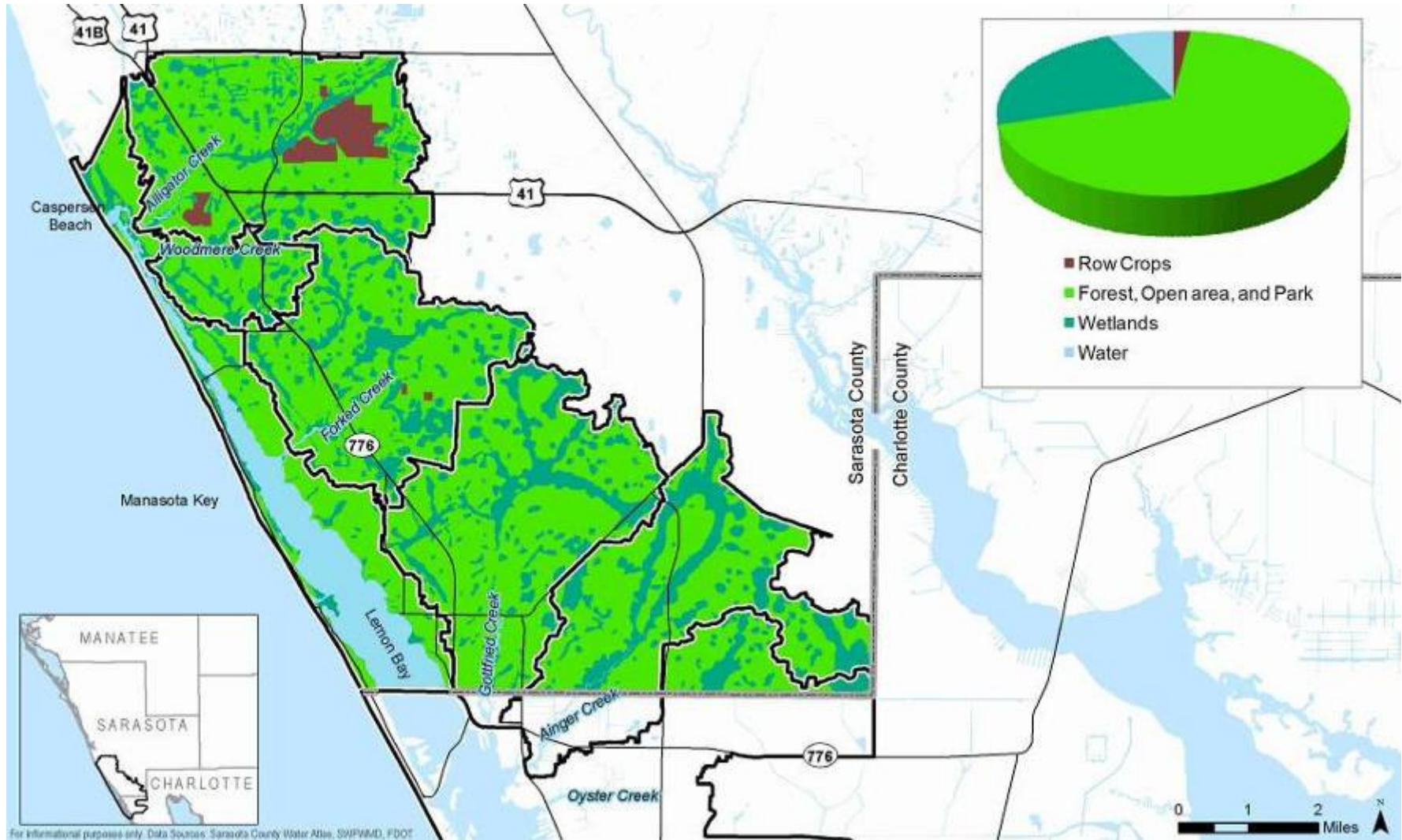


Figure 1-11 Lemon Bay Watershed Historical Land Use (Derived from USDA 1948 Aerials and NRCS 1959 Soils Survey)

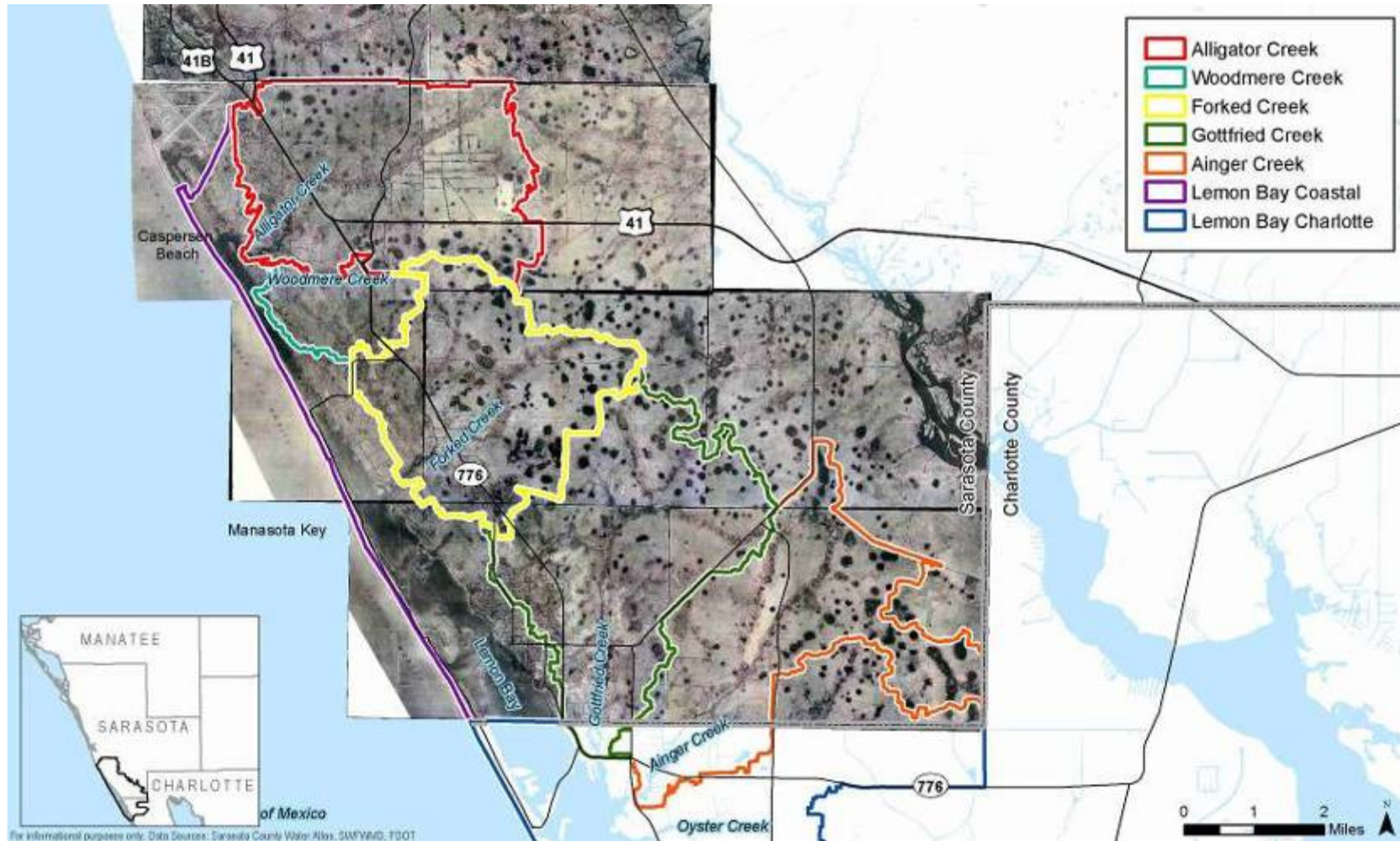


Figure 1-12 Lemon Bay Watershed 1948 Aerial Image



Table 1-4 Estimated Lemon Bay Watershed Historical Land Use* (Derived from USDA 1948 Aerials and NRCS 1959 Soils Survey)

| Land Use | Basin | | | | | | | | | | | | Lemon Bay Watershed | |
|-----------------------------|-----------|---------|----------|---------|--------|---------|-----------|---------|--------|---------|---------|---------|---------------------|---------|
| | Alligator | | Woodmere | | Forked | | Gottfried | | Ainger | | Coastal | | Acres | Percent |
| | Acres | Percent | Acres | Percent | Acres | Percent | Acres | Percent | Acres | Percent | Acres | Percent | | |
| Row Crops | 602 | 8.9 | 0 | 0.0 | 17 | 0.3 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 619 | 1.9 |
| Forest, Open area, and Park | 4,863 | 71.5 | 1,119 | 75.9 | 4,298 | 73.3 | 5,263 | 74.8 | 3,771 | 67.8 | 2,650 | 47.5 | 21,964 | 68.0 |
| Wetlands | 1,313 | 19.3 | 356 | 24.1 | 1,528 | 26.1 | 1,732 | 24.6 | 1,782 | 32.1 | 712 | 12.8 | 7,423 | 23.0 |
| Water | 21 | 0.3 | 0 | 0.0 | 19 | 0.3 | 43 | 0.6 | 6 | 0.1 | 2,212 | 39.7 | 2,302 | 7.1 |

*The Charlotte County portion of the Lemon Bay watershed is not included in this analysis.

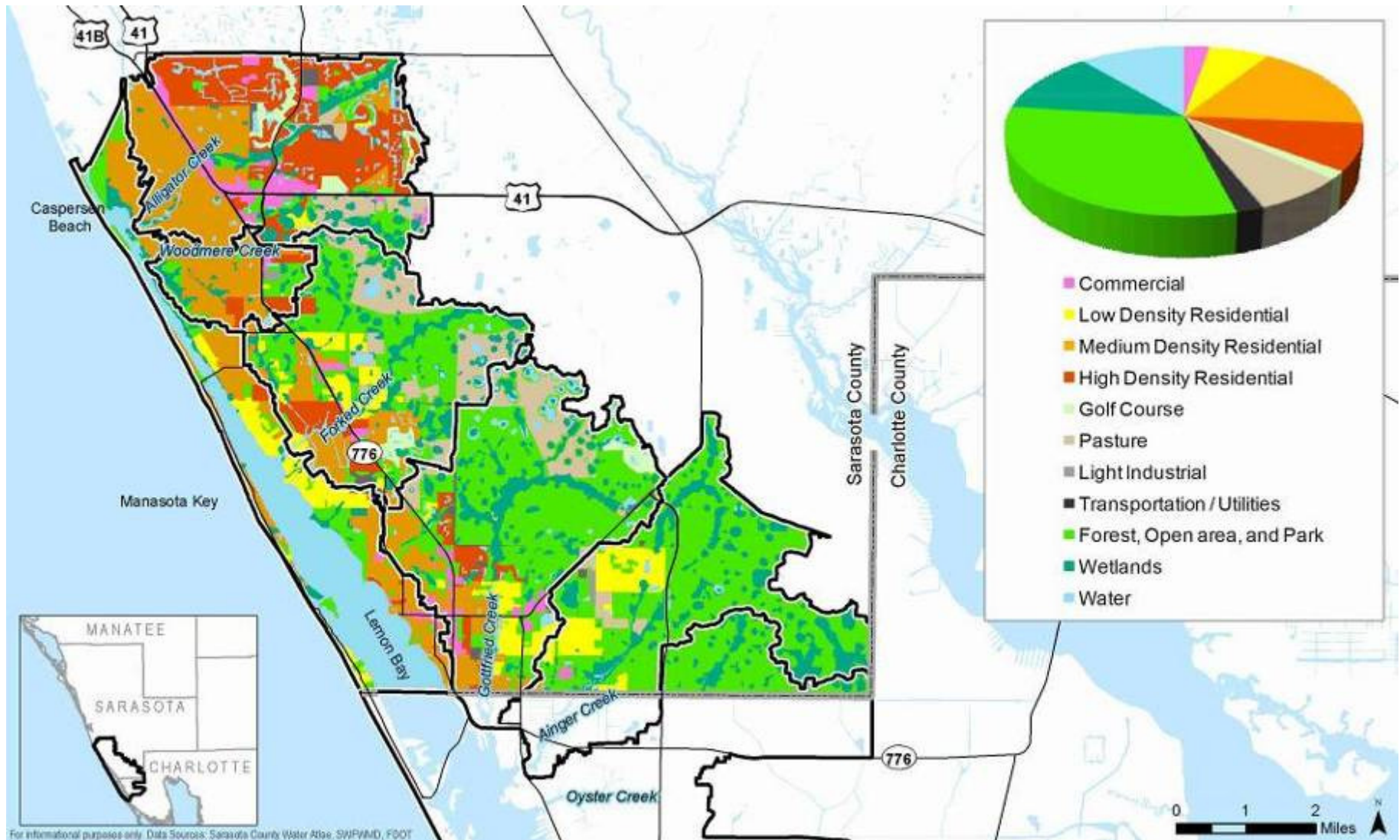


Figure 1-13 Lemon Bay Current Land Use Classification (SWFWMD 2004)



| Table 1-5 Lemon Bay Current Land Use Classification (FDOT 1999) | |
|------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Land Use | FLUCCS |
| Commercial | 1400, 1700 |
| Low-Density Residential | 1100 |
| Medium-Density Residential | 1000, 1200 |
| High-Density Residential | 1300 |
| Golf Course | 1820 |
| Pasture | 2100, 3300, 7400 |
| Agriculture | 2200, 2300, 2400, 2500, 2550 |
| Row Crops | 2000, 2140 |
| Light Industrial | 1500 |
| Transportation/Utilities | 8100, 8200, 8300 |
| Forest, Open Area, and Park | 1800, 1900, 2600, 3100, 3200, 4000, 4100, 4110, 4120, 4200, 4340, 4400 |
| Wetlands | 6000, 6100, 6110, 6120, 6150, 6200, 6210, 6300, 6410, 6420, 6430, 6440, 6450, 6600 |
| Water | 1600, 5100, 5200, 5300, 5330, 5340, 5400, 5410, 5720, 6530 |



Table 1-6 Lemon Bay Watershed Current Land Use (SWFWMD 2004)

| Land Use | Basin | | | | | | | | | | | | Lemon Bay Watershed | |
|-----------------------------|-----------|---------|----------|---------|--------|---------|-----------|---------|--------|---------|---------|---------|---------------------|---------|
| | Alligator | | Woodmere | | Forked | | Gottfried | | Ainger | | Coastal | | | |
| | Acres | Percent | Acres | Percent | Acres | Percent | Acres | Percent | Acres | Percent | Acres | Percent | Acres | Percent |
| Commercial | 487 | 7.2 | 16 | 1.1 | 62 | 1.1 | 221 | 3.1 | 20 | 0.4 | 64 | 1.2 | 870 | 2.7 |
| Low-Density Residential | 48 | 0.7 | 12 | 0.8 | 461 | 7.9 | 342 | 4.9 | 630 | 11.3 | 567 | 10.2 | 2,059 | 6.4 |
| Medium-Density Residential | 1,811 | 26.6 | 777 | 52.7 | 712 | 12.2 | 746 | 10.6 | 23 | 0.4 | 1,475 | 26.5 | 5,545 | 17.2 |
| High-Density Residential | 2,010 | 29.6 | 209 | 14.2 | 355 | 6.1 | 270 | 3.8 | 0 | 0.0 | 56 | 1.0 | 2,901 | 9.0 |
| Golf Course | 252 | 3.7 | 0 | 0.0 | 97 | 1.7 | 132 | 1.9 | 0 | 0.0 | 0 | 0.0 | 481 | 1.5 |
| Pasture | 360 | 5.3 | 0 | 0.0 | 998 | 17.0 | 774 | 11.0 | 134 | 2.4 | 4 | 0.1 | 2,271 | 7.0 |
| Light Industrial | 0 | 0.0 | 21 | 1.4 | 0 | 0.0 | 0 | 0.0 | 28 | 0.5 | 8 | 0.1 | 57 | 0.2 |
| Transportation/ Utilities | 299 | 4.4 | 27 | 1.8 | 107 | 1.8 | 157 | 2.2 | 63 | 1.1 | 24 | 0.4 | 677 | 2.1 |
| Forest, Open Area, and Park | 481 | 7.1 | 246 | 16.7 | 1,928 | 32.9 | 3,157 | 44.9 | 3,485 | 62.7 | 690 | 12.4 | 9,987 | 30.9 |
| Wetlands | 584 | 8.6 | 133 | 9.0 | 899 | 15.3 | 892 | 12.7 | 1,093 | 19.7 | 232 | 4.2 | 3,833 | 11.9 |
| Water | 467 | 6.9 | 32 | 2.2 | 243 | 4.1 | 347 | 4.9 | 84 | 1.5 | 2,454 | 44.0 | 3,628 | 11.2 |

*The Charlotte County portion of the Lemon Bay watershed is not included in this analysis.



Table 1-7 Lemon Bay Watershed Historical to Current Land Use Changes

| Land Use | Basin | | | | | | Lemon Bay Watershed |
|-----------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| | Alligator Creek | Woodmere Creek | Forked Creek | Gottfried Creek | Ainger Creek | Lemon Bay Coastal | Current-Historical (Ac) |
| | Current-Historical (Ac) | Current-Historical (Ac) | Current-Historical (Ac) | Current-Historical (Ac) | Current-Historical (Ac) | Current-Historical (Ac) | |
| Commercial | 487 | 16 | 62 | 221 | 20 | 64 | 870 |
| Low-Density Residential | 48 | 12 | 461 | 342 | 630 | 567 | 2,059 |
| Medium-Density Residential | 1,811 | 777 | 712 | 746 | 23 | 1,475 | 5,545 |
| High-Density Residential | 2,010 | 209 | 355 | 270 | 0 | 56 | 2,901 |
| Golf Course | 252 | 0 | 97 | 132 | 0 | 0 | 481 |
| Pasture | 360 | 0 | 998 | 774 | 134 | 4 | 2,271 |
| Row Crops | -602 | 0 | -17 | 0 | 0 | 0 | -619 |
| Light Industrial | 0 | 21 | 0 | 0 | 28 | 8 | 57 |
| Transportation/Utilities | 299 | 27 | 107 | 157 | 63 | 24 | 676 |
| Forest, Open Area, and Park | -4,382 | -873 | -2,370 | -2,106 | -286 | -1,960 | -11,977 |
| Wetlands | -729 | -223 | -629 | -840 | -689 | -481 | -3,590 |
| Water | 446 | 32 | 224 | 304 | 78 | 242 | 1,326 |

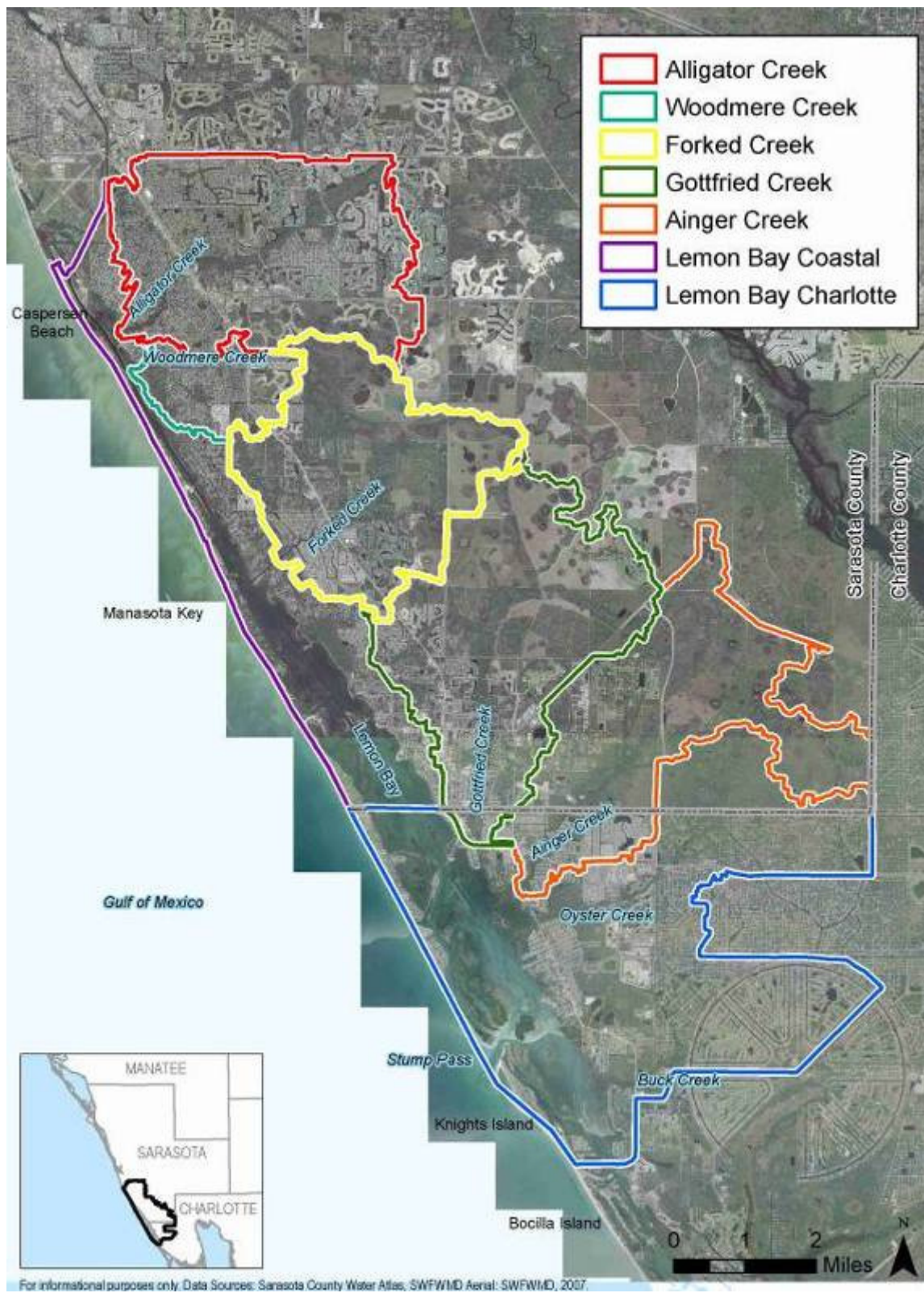


Figure 1-14 Lemon Bay Watershed 2007 Aerial Image

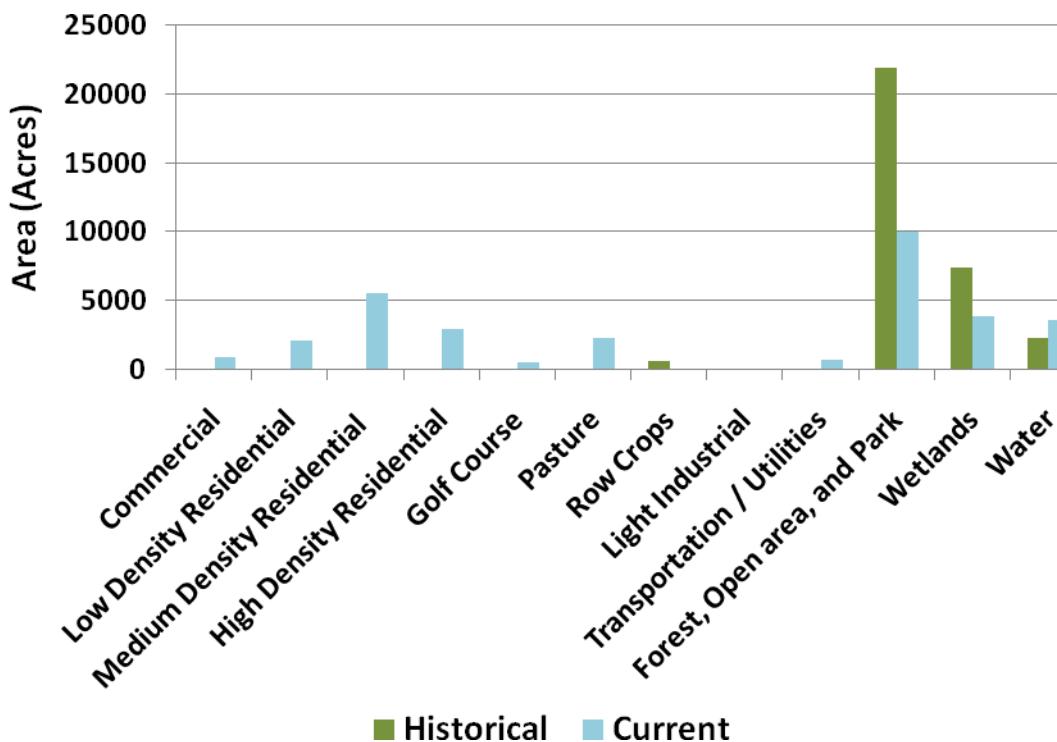


Figure 1-15 Lemon Bay Watershed Historical and Current Land Use

1.3.8.3 Future Land Use

Future land use within the Lemon Bay watershed was estimated from a built-out scenario of SWFWMD’s 2004 land use coverage. All “developable” land (FLUCCS 1900, 2100, 2140, 2200, 2300, 2400, 2500, 2600, 3100, 3200, 3300, 4100, 4110, 4120, 4200, 4340, 4400, and 7400) that is not conservation, preservation, or an ESLPP protected site was reclassified as medium-density residential. Estimated future land use coverage is shown in Figure 1-16 and Table 1-8.

Future land use within the Lemon Bay watershed was estimated from a built-out scenario of SWFWMD’s 2004 land use coverage.

Between 2004 and the projected future, the forest, open area, and parks were assumed almost entirely built out, increasing the urban and built-up areas in the watershed by over 200%. Table 1-9 and Figure 1-17 show the current to future change in land use.

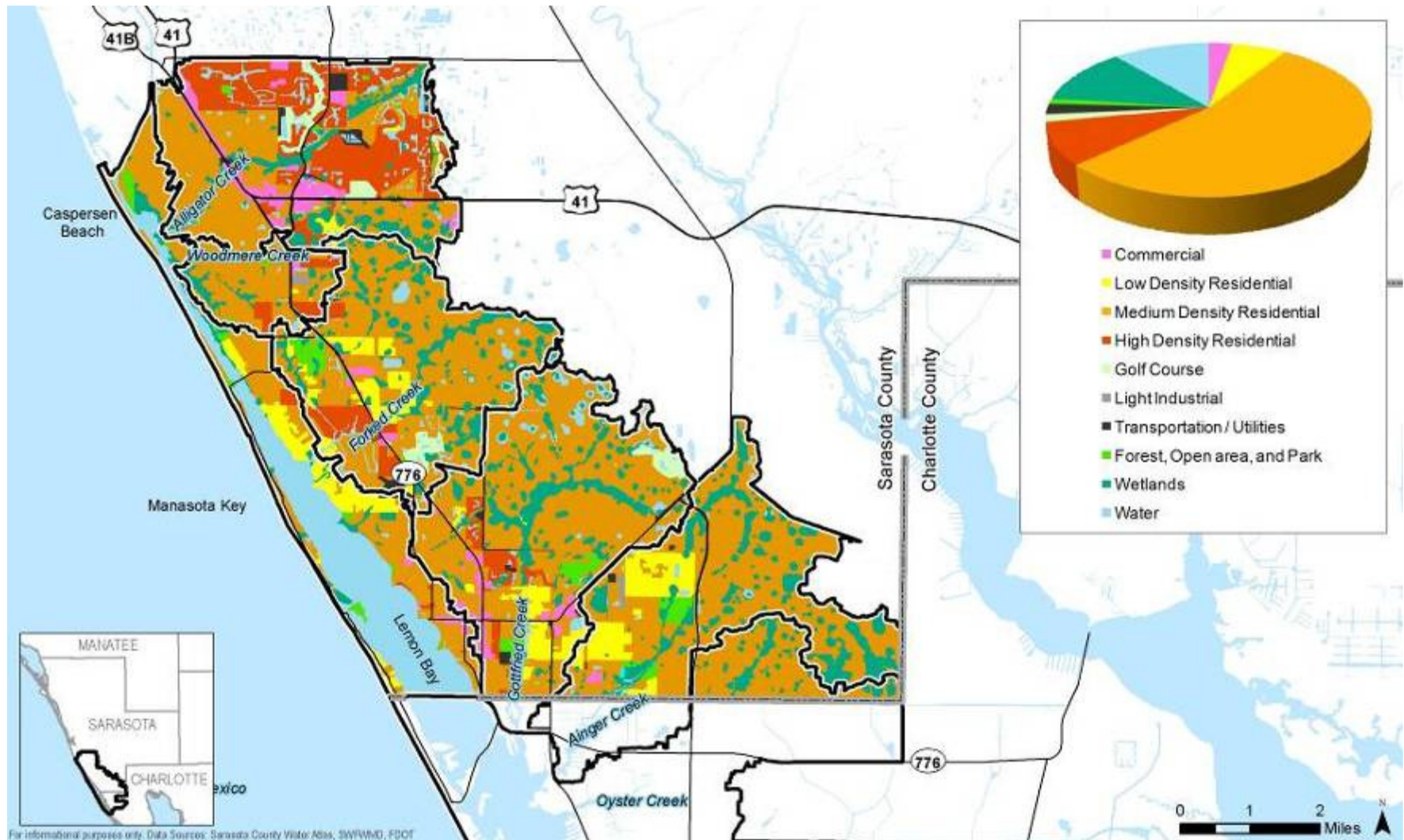


Figure 1-16 Lemon Bay Watershed Future Land Use (Built-out scenario derived from SWFWMD 2004 Land Use)

* The Charlotte County portion of the Lemon Bay Watershed is not included in this analysis.



Table 1-8 Lemon Bay Watershed Future Land Use (Built-out scenario derived from SWFWMD 2004 Land Use)

| Land Use | Basin | | | | | | | | | | | | Lemon Bay Watershed | |
|------------------------------|-----------|---------|----------|---------|--------|---------|-----------|---------|--------|---------|---------|---------|---------------------|---------|
| | Alligator | | Woodmere | | Forked | | Gottfried | | Ainger | | Coastal | | | |
| | Acres | Percent | Acres | Percent | Acres | Percent | Acres | Percent | Acres | Percent | Acres | Percent | Acres | Percent |
| Commercial | 487 | 7.2 | 16 | 1.1 | 62 | 1.1 | 221 | 3.1 | 20 | 0.4 | 64 | 1.2 | 870 | 2.7 |
| Low-Density Residential | 48 | 0.7 | 12 | 0.8 | 461 | 7.9 | 342 | 4.9 | 630 | 11.3 | 567 | 10.2 | 2,060 | 6.4 |
| Medium-Density Residential | 2,624 | 38.6 | 1,003 | 68.1 | 3,520 | 60 | 4,541 | 64.5 | 3,526 | 63.4 | 1,953 | 35 | 17167 | 53.1 |
| High-Density Residential | 2,010 | 29.6 | 209 | 14.2 | 355 | 6.1 | 270 | 3.8 | 0 | 0.0 | 57 | 1.0 | 2,901 | 9.0 |
| Golf Course | 252 | 3.7 | 0 | 0.0 | 97 | 1.7 | 132 | 1.9 | 0 | 0.0 | 0 | 0.0 | 481 | 1.5 |
| Light Industrial | 0 | 0.0 | 21 | 1.4 | 0 | 0.0 | 0 | 0.0 | 28 | 0.5 | 8 | 0.1 | 57 | 0.2 |
| Transportation and Utilities | 299 | 4.4 | 27 | 1.8 | 107 | 1.8 | 157 | 2.2 | 63 | 1.1 | 24 | 0.4 | 677 | 2.1 |
| Forest, Open Area, and Park | 29 | 0.4 | 20 | 1.4 | 119 | 2 | 136 | 1.9 | 116 | 2.09 | 217 | 3.9 | 637 | 2.0 |
| Wetlands | 584 | 8.6 | 133 | 9.0 | 899 | 15.3 | 892 | 12.7 | 1,093 | 19.7 | 232 | 4.2 | 3,833 | 11.9 |
| Water | 467 | 6.9 | 32 | 2.2 | 243 | 4.1 | 347 | 4.9 | 84 | 1.5 | 2,453 | 44.0 | 3,626 | 11.2 |

*The Charlotte County portion of the Lemon Bay watershed is not included in this analysis.



Table 1-9 Lemon Bay Watershed Future to Current Land Use Changes

| Land Use | Basin | | | | | | Lemon Bay Watershed |
|------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| | Alligator Creek | Woodmere Creek | Forked Creek | Gottfried Creek | Ainger Creek | Lemon Bay Coastal | Future-Current (Ac) |
| | Future-Current (Ac) | Future-Current (Ac) | Future-Current (Ac) | Future-Current (Ac) | Future-Current (Ac) | Future-Current (Ac) | |
| Commercial | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Low-Density Residential | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Medium-Density Residential | 813 | 226 | 2,808 | 3,795 | 3,503 | 478 | 11,623 |
| High-Density Residential | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Golf Course | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pasture | -360 | 0 | -998 | -774 | -134 | -4 | -2,270 |
| Light Industrial | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Transportation and Utilities | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Forest, Open Area, and Park | -452 | -226 | -1,809 | -3,021 | -3,369 | -473 | -9,350 |
| Wetlands | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Water | 0 | 0 | 0 | 0 | 0 | -1 | -1 |

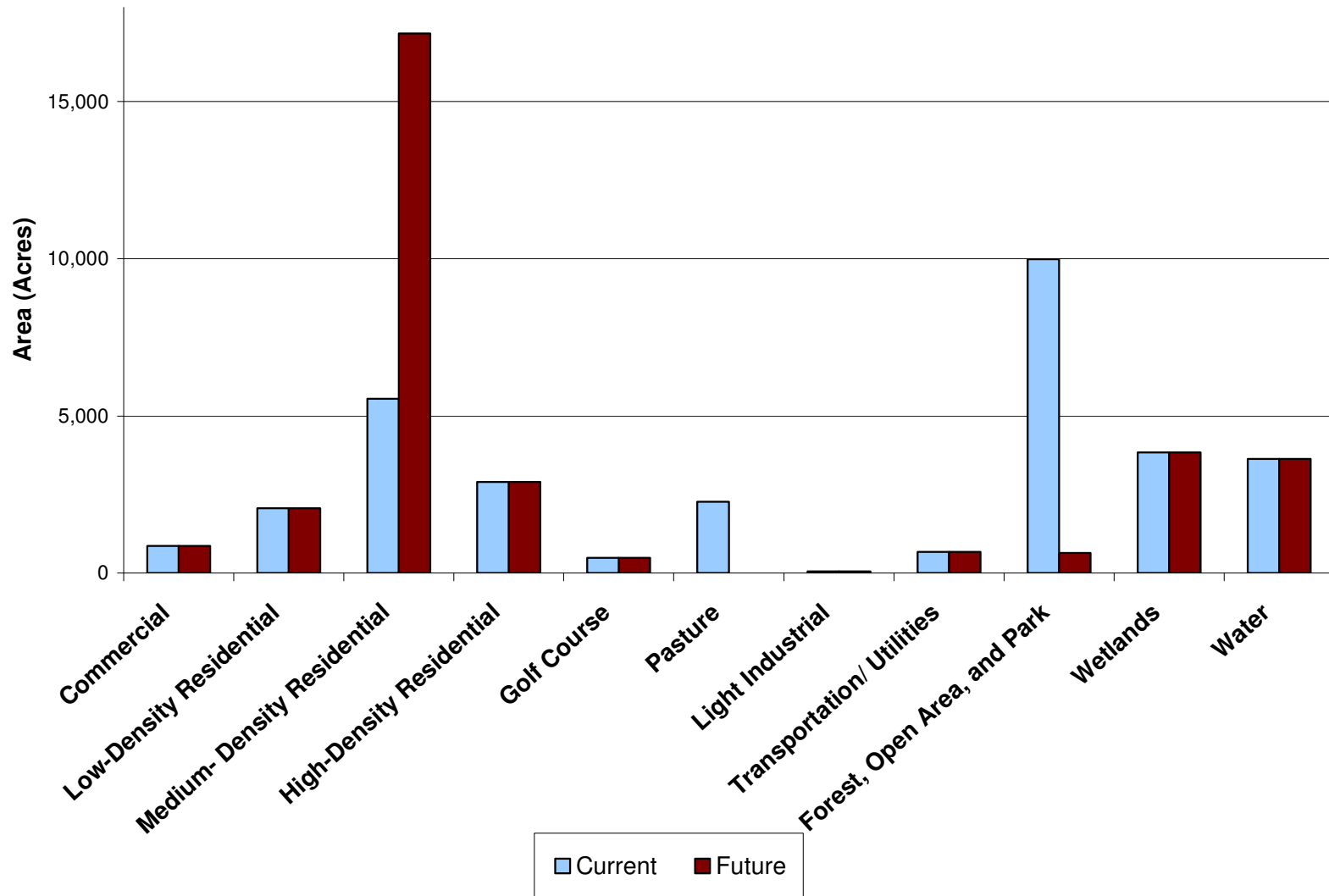


Figure 1-17 Lemon Bay Watershed Current and Future Land Use



1.4 ESTUARY

1.4.1 Boundary

Lemon Bay has two water body identification numbers (WBIDs)—1983A and 1983B (Figure 1-18). The WBIDs are assigned by FDEP and are unique identifiers used to report on Florida’s water quality to the EPA.

Lemon Bay is an estuarine system dominated by mangrove, seagrass, and oyster communities. Lemon Bay extends from Alligator Creek to the south end of Knight Island. The Bay is as wide as 1.2 miles in some areas and averages 0.75 mile in width. It is delineated to the north by a dredged canal that connects Lemon Bay to Dona and Roberts Bay and Venice Inlet via the Intracoastal Waterway (ICW). Lemon Bay has a wide variety of physical features—including beaches, mudflats, sand bars, oyster bars, and salt flats—and aquatic features—including marine and estuarine waters, inlets, bays, and tidal creeks (FDNR, 1992).

The entire bay was designated as an aquatic preserve in 1986 (FDNR, 1992), one of 42 aquatic preserves established as of 1992 under the authority of the Florida Aquatic Preserves Act of 1975. The Lemon Bay Aquatic Preserve is considered to be composed of two waterbodies, Lemon Bay and Placida Harbor (Figure 1-19). Lemon Bay stretches the length of the northern two-thirds of the Preserve. Placida Harbor consists of the southern one-sixth of the Preserve, delineated by the narrow constriction in the bay near Bocilla Island (FDNR, 1992).





Figure 1-18 FDEP WBID (Bay Segments) Designation



Figure 1-19 Lemon Bay Aquatic Preserve



The purpose of setting aside aquatic preserves is to preserve unique, natural aquatic areas in the State in their original condition for future generations to use (FDNR, 1992). The Lemon Bay Aquatic Preserve includes approximately 7,667 acres of submerged land in Charlotte and Sarasota Counties and is classified as one of the OFWs (FDNR, 1992). The classification of OFW limits the types of discharges that can be permitted by FDEP. The Bay was considered “pristine” (FDNR, 1992) during the original writing of the management plan, but there have been heavy pressures for development in the Lemon Bay watershed since then.

The western shoreline of Lemon Bay is the shore of Manasota Key, a narrow barrier island that separates the Bay from the Gulf of Mexico and runs along the northern two-thirds of the Bay. A complex of three barrier islands—Little Gasparilla, Bocilla, and Knight Island—forms the southern third of the western shoreline of the Bay (FDNR 1992). The eastern shoreline is broken by seven tidal creeks. Alligator Creek is the northernmost creek and is close to the northern boundary of the Preserve. Located south of Alligator Creek are Forked Creek, Gottfried Creek, Ainger Creek, Oyster Creek, Buck Creek, and Lemon Creek (FDNR 1992). There are also several mangrove islands, all of which have numerous groves of red mangrove forests and fringe vegetation. White and black mangroves are common landward of the red mangrove forests on the shoreline fringes (FDNR, 1992). Stump Pass, toward the southern end of Lemon Bay, is a shallow natural inlet subject to continuous change in alignment and depth but which remains a navigable inlet.

1.4.2 Designated Use

The EPA Clean Water Act requires that the surface waters of each state be classified according to designated uses. Florida has five classes with associated designated uses, which are arranged in order of degree of protection required:

- ❖ Class I—Potable Water Supplies
- ❖ Class II—Shellfish Propagation or Harvesting
- ❖ Class III—Recreation, Propagation and Maintenance of a Healthy, Well-Balanced Population of Fish and Wildlife (The surface waters of the state are Class III unless described in Rule 62-302.400 FAC)
- ❖ Class IV—Agricultural Water Supplies
- ❖ Class V—Navigation, Utility and Industrial Use (Currently, there are not any designated Class V bodies of water.)

Only three classifications occur in Sarasota County: Classes I, II, and III. The east side of Lemon Bay from Forked Creek south is classified by 62-302.400 FAC as a Class II waterbody; the remaining portion of the Bay is a Class III waterbody.

East side of Lemon Bay from Forked Creek South is a Class II waterbody.



1.4.3 Bathymetry

The average depth of Lemon Bay, before dredging became common, was 1.2 meters at mean high water (MHW) and increased to approximately 2 meters at MHW after construction of the ICW (FDNR, 1992). Bathymetry data were obtained from the National Geophysical Data Center (NGDC). These data have been used by National Ocean Services to produce and update nautical charts for Lemon Bay. These datasets were compiled from multiple sources, including U.S. National Ocean Service Hydrographic Database, U.S. Geological Survey, Monterey Bay Aquarium Research Institute, U.S. Army Corps of Engineers LiDAR, USGS 3 arc-second DEMs and Shuttle Radar Topography Data, and various other academic institutions (Divins and Metzger, 2006). These data are referenced to the mean low water local vertical datum. Figure 1-20 displays the bathymetry contour for Lemon Bay, indicating that the bay is shallow throughout other than the dredged channel of the ICW, with a maximum depth less than 2 meters at mean low water.

1.4.4 Circulation and Coastal Passes

Lemon Bay receives drainage from Alligator Creek, Forked Creek, Gottfried Creek, Ainger Creek, Oyster Creek, Buck Creek, and Lemon Creek. The Bay also receives direct runoff from adjacent lands. Circulation within Lemon Bay has not been well studied, but much of the Bay is a shallow, well-mixed system with a coastal inlet toward the southern extent, suggesting that replacement times would be low in the southern extent. However, the northern portion of Lemon Bay is constricted and receives drainage from Alligator Creek as well as the ditched channel to Venice inlet. Therefore, it is likely that this portion of Lemon Bay behaves very differently than the more southern extent. A mix of diurnal and semi-diurnal tides result in average tidal amplitudes of ~0.7m, and wind driven currents affect circulation throughout the bay. A circulation model, which will contribute to the knowledge of retention times and circulation patterns in Lemon Bay, is being discussed as part of this WMP.

1.4.5 Sediment

The bulk of the sediments in Lemon Bay is composed of quartz sands and gravel from crushed shell material. According to Estevez (1981, as cited in FDNR, 1992), the overall majority of sediments in the Bay is composed of quartz sand. There are also clay minerals, phosphate minerals, and carbonate minerals that include magnesium calcite, dolomite, and aragonite (FDNR, 1992).

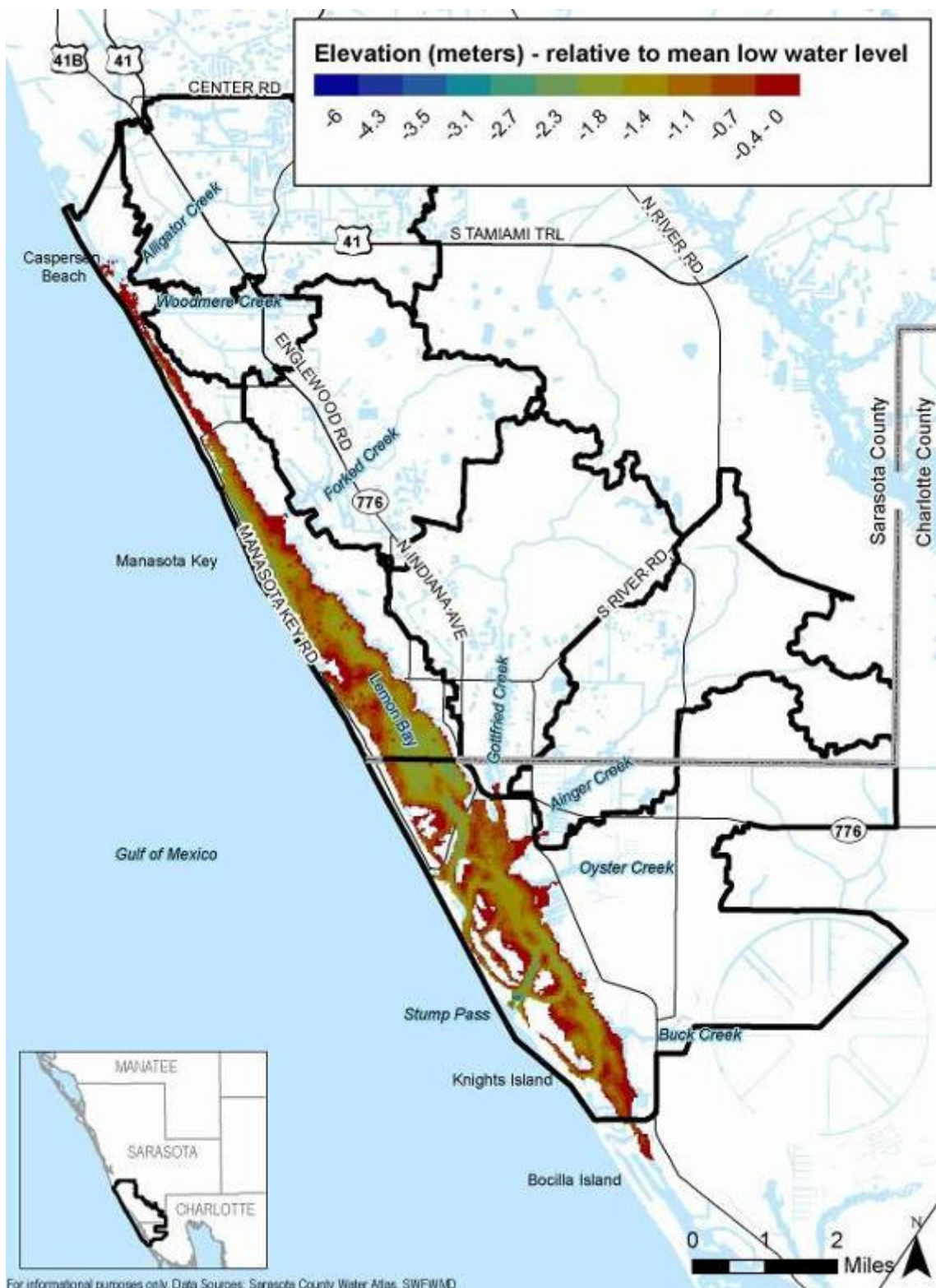


Figure 1-20 Bathymetry Contour for Lemon Bay Based on NGDC Data Referenced to Mean Low Water (Meters)



Lemon Bay sediments consist principally of fine sand, muddy sand, and silt-clay (Culter and Leverone, 1993). The bay bottom has been extensively altered as a result of dredge-and-fill projects, including latitudinal channelization of the entire bay for construction of the ICW. Construction of the ICW resulted in several spoil islands within the Bay, many of which over time have become fringed with mangroves. Dredge holes, which are thought to be remnants of dredging projects for purposes other than navigation, have also been observed in several locations within Lemon Bay. The type of bay bottom sediment varies in relationship to predominant water currents and water depths within the area. Channelized areas act as sinks for fine grain sediments and organic materials (SBEP, 1992). Dredged areas with poor circulation tend to become hypoxic and anoxic over time, reducing capacity to support diverse aquatic life. Hardened shorelines and construction of boat slips and marinas throughout the Bay have also altered bottom sediments.

1.5 PUBLIC LANDS

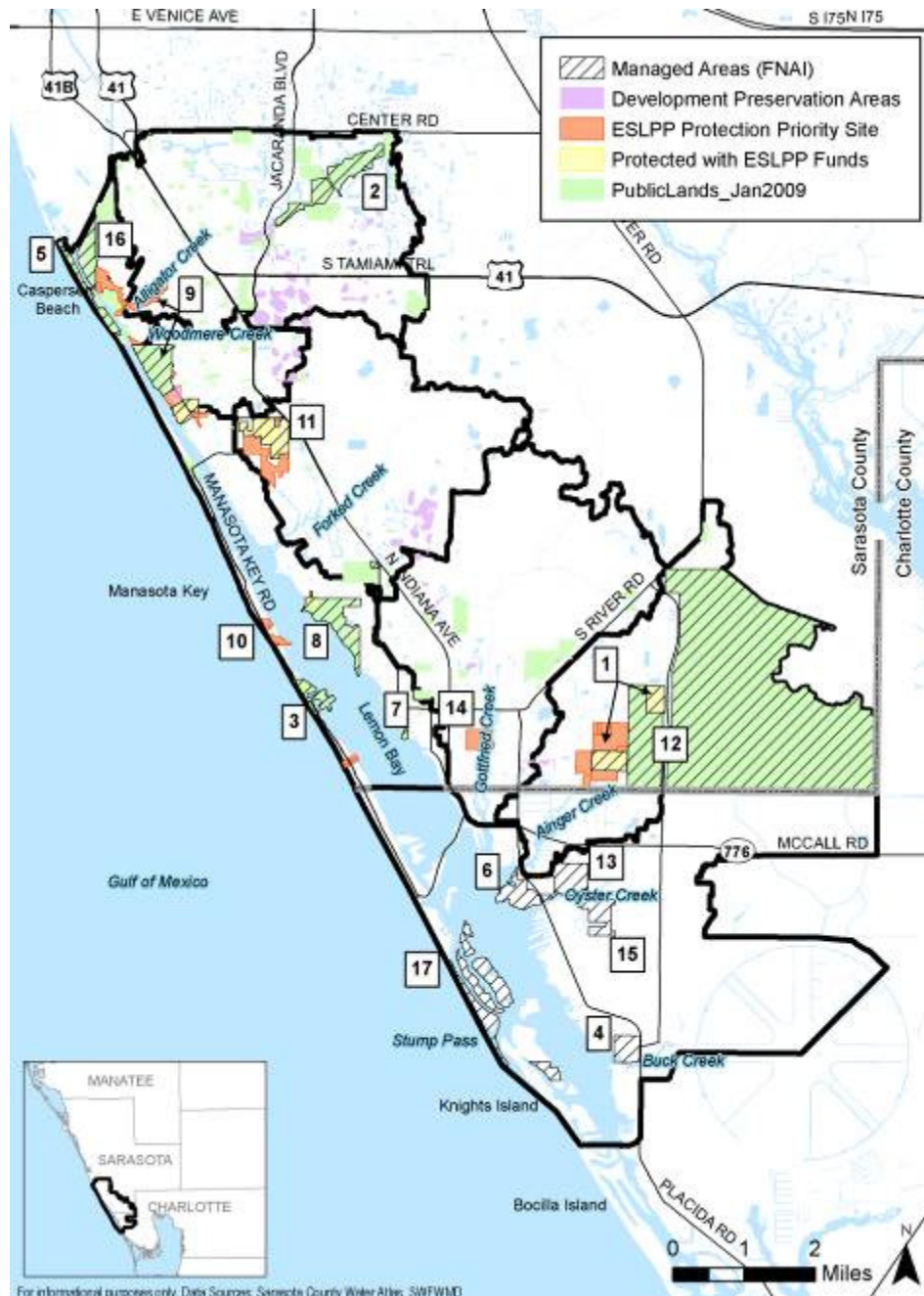
The Lemon Bay watershed contains 47,861 acres and, with the exception of the northern, southern, and coastal portions, much of the watershed is currently undeveloped. The eastern portion has, however, recently been annexed into the City of North Port and much of the watershed will likely be developed in the next 5 to 10 years. Most remaining natural areas are in the inland portion of the watershed, with only isolated natural areas in coastal areas (Figure 1-21).

Designated natural and conservation areas make up only 17% of the entire watershed area and include Priority Sites, Protected Lands, Public Lands, and Developed Properties Preserves.

Priority sites are unprotected lands identified by the County's ESLPP as priorities for future protection. Priority sites in the County are ranked on environmental criteria, including connectivity, water quality, habitat rarity, land quality, and manageability. ESLPP continually works to acquire and protect natural lands.

Protected lands are those lands protected through the ESLPP program which is funded by a 0.25-mill ad valorem tax that passed by referendum in March 1999 and was extended through 2029 by a second referendum in November 2005 (includes fee simple acquisitions, conservation easements, and lands protected through partnerships between ESLPP and other agencies/authorities).

Public lands are the major public (State, County, City) natural areas in Sarasota County, Florida as defined by Sarasota County Resource Management. Some portion of the area has been identified as having conservation, preservation, or mitigation uses. The Florida Natural Areas Inventory (FNAI) has also identified public lands in the watershed as having natural resource value. These lands are, therefore, being managed by the State, Local, or Federal government for conservation purposes.



- | | |
|-------------------------------------|------------------------------------|
| 1 Ainger Creek Conservation Area | 10 Manasota Coastal Hammocks |
| 2 Alligator Creek Conservation Area | 11 Manasota Scrub Preserve |
| 3 Blind Pass Park | 12 Myakka State Forest |
| 4 Buck Creek Preserve | 13 Oyster Creek Environmental Park |
| 5 Capersen Beach County Park | 14 Rosemary Scrub Preserve |
| 6 Cedar Point Environmental Park | 15 San Casa Environmental Park |
| 7 Indian Mound Park | 16 Shamrock Park |
| 8 Lemon Bay Park | 17 Stump Pass Beach State Park |
| 9 Lemon Bay Preserve | |

Figure 1-21 Lemon Bay Watershed Environmentally Sensitive Lands



Developed properties preserves are preservation, conservation, and mitigation areas in private developments in Sarasota County as depicted in Land Development Regulations site development plans or Sarasota County plat books.

Examples of protected areas and priority protection sites, which are important for sustaining natural resources, include the Lemon Bay Preserve, Lemon Bay Park, Ainger Creek, Manasota Coastal Hammocks, Casperson Beach, Manasota Scrub, and Rosemary Scrub sites that are shown in Figure 1-21 and described below.

The Lemon Bay Preserve is a 195-acre site on the ICW and contains some of the last remaining undeveloped bay shorelines in the County. These lands protect the water quality and estuary of Lemon Bay. They also provide habitat for endangered plant species, many wading birds, and tidal species. In addition, the Lemon Bay Preserve provides significant areas of scrub habitat.

The Lemon Bay Park covers over 200 acres of pine and scrubby flatwoods along the natural bay shoreline. The Park provides quality wetland and pine flatwoods habitat for nesting bald eagles and other wildlife, as well as water quality benefits for Lemon Bay.

The Ainger Creek Protection Priority Site is 420 acres and is adjacent to the western boundary of Myakka State Forest. This site contains riverine wetlands, hammock, and pine flatwoods and supports a variety of wading birds. This site helps buffer the State Forest and Charlotte Harbor State Buffer Preserve to protect the water quality of Lemon Bay. In addition, the Ainger Creek site protects quality habitat directly along the creek.



Tortoise seen on Manasota Key, August 2007

The Manasota Coastal Hammocks Protection Priority Site is 24 acres on the south end of Manasota Key and consists of tropical hardwood hammock, a habitat that has almost been



eliminated in Sarasota County, as well as beach, dune, and mangrove communities. The tract also contains several endangered species, including the prickly apple cactus.

Casperson Beach is south of the Venice Airport on Harbor Drive. The southern two-thirds of beachfront have been left in its natural state. A dune restoration system with walkovers has been implemented to preserve the shoreline. In 2000, a successful large-scale exotic removal program eradicated large thickets of Brazilian Pepper from the beach. Brazilian Pepper was the dominant vegetation before it was eradicated.

The Manasota Scrub Preserve is 256 acres of quality scrub jay habitat, pine flatwoods, depression marsh, and large maple marsh. Florida scrub jays, eastern indigo snakes, gopher tortoises, a variety of wading birds, and the Florida mouse inhabit the site. Once an extensive “scrub island,” this part of the County has been heavily developed, leaving only scattered pockets of habitat for the Florida scrub jay, the state’s only endemic bird. The preserve is also a valuable recreational facility.

The Rosemary Scrub Protection Priority Site is 67 acres of predominantly sand pine and rosemary scrub, a rare type of scrub habitat in Sarasota County. It is south of Dearborn Street, between SR 776 and Gottfried Creek, with about a half mile of creek frontage. Although the site is typically very dry, seasonal wetlands with high-quality mangrove and salt marsh habitats occur along Gottfried creek. This site’s proximity to the Bay, undeveloped land to the east, and nearby protected scrub makes it a valuable sanctuary for wildlife in the Englewood urban area. Protecting this natural area along Gottfried Creek is also important for maintaining water quality.

The Englewood Water District (EWD), an independent public agency, owns the entire Rosemary Scrub Protection Priority Site. The area is used as a potable water wellfield, which is compatible with protecting its environmental features. The site has no permanent protection if the current use or ownership changes. The EWD governing board has voted to consider entering into an agreement with Sarasota County to protect the site while allowing the wellfield operations to continue.

1.6 THREATENED AND ENDANGERED SPECIES

Sarasota County’s environmentally sensitive lands provide safe habitat for many threatened and endangered native species, including Florida scrub jays, eagles, gopher tortoises, manatees, and sea turtles. Figure 1-22 show sightings reported in the Lemon Bay Watershed.

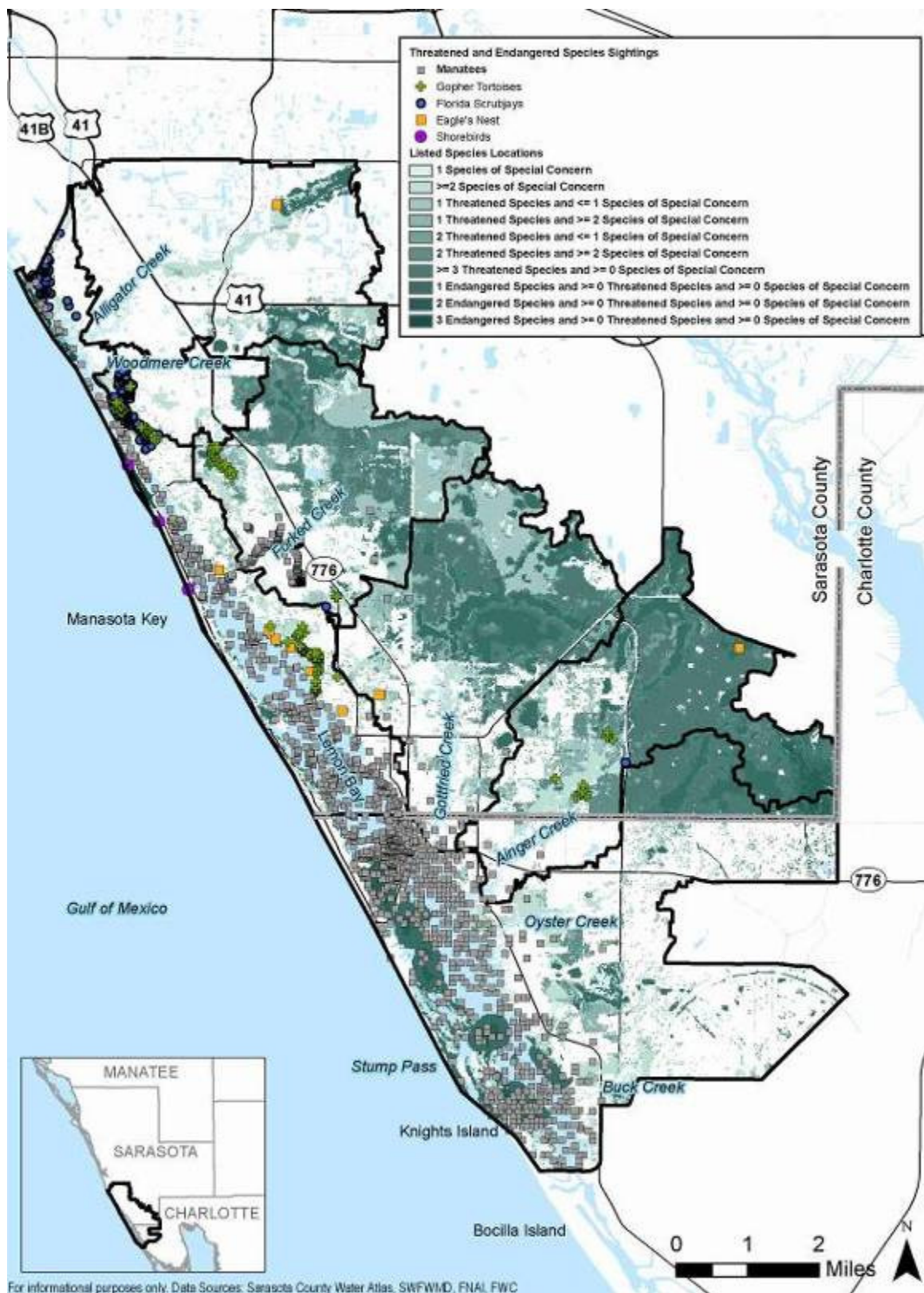


Figure 1-22 Lemon Bay Watershed Threatened and Endangered Species Sightings



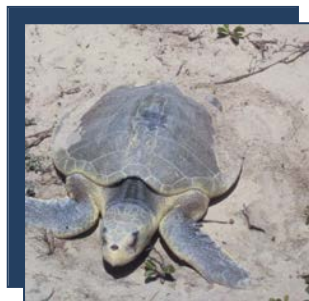
The Florida scrub jay was added to the State threatened species list in 1975 and the Federal threatened species list in 1987. Named for its habitat, the scrub jay prefers the sandy, arid Florida scrub. Unfortunately, Florida scrub is also attractive for its high development potential, which threatens the Florida scrub jay's habitat. To protect the species and reduce regulatory burdens imposed on developers by the Endangered Species Act, Sarasota County is developing a Habitat Conservation Plan (HCP) for the Florida scrub jay. The HCP will define a preserve network and establish a mitigation credit system for developers impacting a scrub habitat (scgov.net).

Although removed from the Federal list of Threatened and Endangered Species in August 2007, the bald eagle is still protected by Federal (Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act) and State law (Florida Statute 372.0725). Eagles are very sensitive to human activity and require nesting areas free from human activity. There are approximately 1,133 bald eagles in Florida and 41 reported active nests in Sarasota County (scgov.net). If a nest has been sighted or reported on or near a property, Sarasota County requires proof of coordination with the U.S. Fish and Wildlife Service (USFWS) before a building permit can be issued.



Photo from Sarasota County Online

The gopher tortoise is another endangered species that lives in Sarasota County. Like the scrub jay, the tortoise prefers high, dry habitats, such as scrubs, coastal dunes, and pine flatwoods. Habitat destruction from development has reduced their habitat area and diminished the number of surviving tortoises. The ESLPP lands provide a much-needed haven for this creature. In turn, the tortoise's burrow is used by several other threatened species for shelter, such as the indigo snake, gopher frog, and the Florida mouse.



Photos from Wikipedia: (L-R, Gopher Tortoise, Kemp's Ridley Turtle and Leatherback Turtle)

Sarasota County protected lands also provide a safe nesting habitat for sea turtles. Sarasota County has the highest density of sea turtle nesting on the Gulf Coast of Florida and has supported nesting of the Kemp's ridley, loggerhead, leatherback turtle, and the green sea turtles. The ridley and the leatherback are two of the most endangered species of sea turtles. The Sarasota County Comprehensive Plan requires that special measures be taken to protect sea turtles and their habitats (scgov.net).



Sarasota County is one of 13 counties designated as a priority protection site for the West Indian Manatee, which is protected by State and Federal law. Sarasota County adopted a Manatee Protection Plan in September 2003 (scgov.net). The Sarasota County Government Online website (scgov.net) states that the plan includes:



- ❖ An inventory of boat facilities
- ❖ An assessment of boating and activity patterns
- ❖ Manatee sighting and mortality information.
- ❖ A boat facility siting plan—to determine the best areas for new marinas, boat ramps, etc.
- ❖ Manatee protection measures, such as boating speed regulations in areas with high boat and manatee usage
- ❖ Information on aquatic preserves, OFW, ports, manatee refuges, etc. within the county
- ❖ An education and awareness program for the public and boaters, divers, and school children.
- ❖ A water quality and habitat protection program (including land acquisition, and aquatic plant control plans for manatee areas)

1.7 RECREATIONAL FACILITIES

Sarasota County has more than 200 parks, 109 athletic fields, miles of pristine beaches, and more than 2000 acres of open space parkland. The County owns 52 facilities and maintains public recreational amenities totaling 1,517 acres within the watershed (Table 1-10). In addition, the County will maintain the Diocese of Venice, owned by the City of Venice, in the future. These sites include athletic fields, beaches, natural areas, and neighborhood parks. The parks range in size and land use from urban sites of under an acre to several large natural area parks, the largest of which is the Lemon Bay Park and Environmental Center at 209 acres. The parks are distributed throughout the Sarasota County portion of the watershed, as shown in Figure 1-23.



Table 1-10 Lemon Bay Watershed Area Recreational Facilities

| MapID | Name | Park Class | Acres | Owner |
|-------|-----------------------------------------|-------------------------------------|---------|-----------------|
| 1 | Alligator Creek Conservation Area | Conservation Land | 212.6 | Sarasota County |
| 2 | Blind Pass Beach (future park) | Beach Access Park | 64.8 | Sarasota County |
| 3 | Casperson Beach | Beach Access Park/Natural Area Park | 88.7 | Sarasota County |
| 4 | Casperson Intracoastal | Neighborhood Park/Natural Area Park | 69.0 | Sarasota County |
| 5 | Challenger Park | Neighborhood Park | 3.9 | Sarasota County |
| 6 | Diocese Of Venice (Future Park) | | 20.0 | City of Venice |
| 7 | Englewood Sports Complex | District Park | 137.4 | Sarasota County |
| 8 | Indian Mound Park | Boat Access Park/Natural Area Park | 10.4 | Sarasota County |
| 9 | Kiwanis Park/Buchan Park | Neighborhood Park | 6.4 | Sarasota County |
| 10 | Lemon Bay Park And Environmental Center | Linear Park/Natural Area Park | 208.9 | Sarasota County |
| 11 | Lemon Bay Preserve | Linear Park/Conservation Land | 166.1 | Sarasota County |
| 12 | Manasota Beach | Conservation Land | 21.4 | Sarasota County |
| 13 | Manasota Scrub Preserve | Natural Area Park | 140.5 | Sarasota County |
| 14 | Myakka State Forest | | 8,366.0 | SWFWMD |
| 15 | Nightingale Park (So. Venice Park #17) | Neighborhood Park | 5.2 | Sarasota County |
| 16 | Plantation Park | Natural Area Park | 24.2 | Sarasota County |
| 17 | Shamrock Park And Nature Center | Natural Area Park | 149.2 | Sarasota County |
| 18 | Skip Stasko Park (South Venice Park #2) | Neighborhood Park | 6.3 | Sarasota County |
| 19 | South Venice Park #10 | Neighborhood Park | 4.2 | Sarasota County |
| 20 | South Venice Park #11 | Neighborhood Park | 5.7 | Sarasota County |
| 21 | South Venice Park #12 | Neighborhood Park | 1.3 | Sarasota County |
| 22 | South Venice Park #13 | Neighborhood Park | 5.6 | Sarasota County |
| 23 | South Venice Park #14 | Neighborhood Park | 1.6 | Sarasota County |
| 24 | South Venice Park #15 | Neighborhood Park | 4.4 | Sarasota County |



Table 1-10 Lemon Bay Watershed Area Recreational Facilities

| MapID | Name | Park Class | Acres | Owner |
|-------|-----------------------|-------------------|-------|-----------------|
| 25 | South Venice Park #16 | Natural Area Park | 3.1 | Sarasota County |
| 26 | South Venice Park #18 | Natural Area Park | 0.8 | Sarasota County |
| 27 | South Venice Park #19 | Natural Area Park | 0.5 | Sarasota County |
| 28 | South Venice Park #20 | Neighborhood Park | 1.7 | Sarasota County |
| 29 | South Venice Park #21 | Natural Area Park | 1.2 | Sarasota County |
| 30 | South Venice Park #22 | Natural Area Park | 2.2 | Sarasota County |
| 31 | South Venice Park #23 | Neighborhood Park | 9.2 | Sarasota County |
| 32 | South Venice Park #24 | Natural Area Park | 0.5 | Sarasota County |
| 33 | South Venice Park #25 | Neighborhood Park | 7.0 | Sarasota County |
| 34 | South Venice Park #26 | Neighborhood Park | 5.4 | Sarasota County |
| 35 | South Venice Park #27 | Neighborhood Park | 2.0 | Sarasota County |
| 36 | South Venice Park #29 | Natural Area Park | 8.3 | Sarasota County |
| 37 | South Venice Park #2a | Neighborhood Park | 3.2 | Sarasota County |
| 38 | South Venice Park #3 | Neighborhood Park | 1.3 | Sarasota County |
| 39 | South Venice Park #30 | Neighborhood Park | 3.1 | Sarasota County |
| 40 | South Venice Park #31 | Neighborhood Park | 0.2 | Sarasota County |
| 41 | South Venice Park #32 | Neighborhood Park | 0.7 | Sarasota County |
| 42 | South Venice Park #33 | Natural Area Park | 1.9 | Sarasota County |
| 43 | South Venice Park #34 | Natural Area Park | 10.2 | Sarasota County |
| 44 | South Venice Park #35 | Neighborhood Park | 3.3 | Sarasota County |
| 45 | South Venice Park #36 | Natural Area Park | 3.2 | Sarasota County |
| 46 | South Venice Park #37 | Natural Area Park | 1.6 | Sarasota County |
| 47 | South Venice Park #4 | Neighborhood Park | 1.3 | Sarasota County |
| 48 | South Venice Park #5 | Natural Area Park | 4.9 | Sarasota |



| Table 1-10 Lemon Bay Watershed Area Recreational Facilities | | | | |
|--------------------------------------------------------------------|-------------------------------------|-------------------|-------|-----------------|
| MapID | Name | Park Class | Acres | Owner |
| | | | | County |
| 49 | South Venice Park #6 | Natural Area Park | 5.6 | Sarasota County |
| 50 | South Venice Park #7 | Neighborhood Park | 2.7 | Sarasota County |
| 51 | South Venice Park #8 | Neighborhood Park | 3.3 | Sarasota County |
| 52 | South Venice Park #9 | Natural Area Park | 4.4 | Sarasota County |
| 53 | Venice Area Audubon Rookery | | 3.1 | |
| 54 | Venice Gardens Playground | Neighborhood Park | 10.2 | Sarasota County |
| 55 | Woodmere Park and Woodmere Paw Park | Community Park | 76.1 | Sarasota County |

1.8 PUBLIC EDUCATION

Sarasota County and other entities promote environmental stewardship and assist individuals, community-based organizations, businesses, schools, and others to undertake watershed restoration initiatives in Sarasota County through public outreach and education. Environmental Services, Citizens Academy, Forestry Division, Neighborhood Services, and Access Sarasota provide many outreach programs, such as community and school educational programs about recycling, and Keep Sarasota County Beautiful manages several outreach programs such as Adopt-a-Road, Adopt-a-Park, and Adopt-a-Shore. The County’s Neighborhood Services Department offers classes and workshops on how to improve and maintain communities and provides grants to implement what residents have learned to enhance their neighborhoods’ character, value, safety, health, and infrastructure.

The County’s Neighborhood Environmental Stewardship Team (NEST) is a volunteer organization partnering with residents to increase awareness of the importance of native habitats and watersheds in our community. NEST’s primary purpose is to provide constructive and meaningful activities for people to improve the environmental quality of their watershed and neighborhoods while expanding the knowledge base and advocacy for watershed improvements.

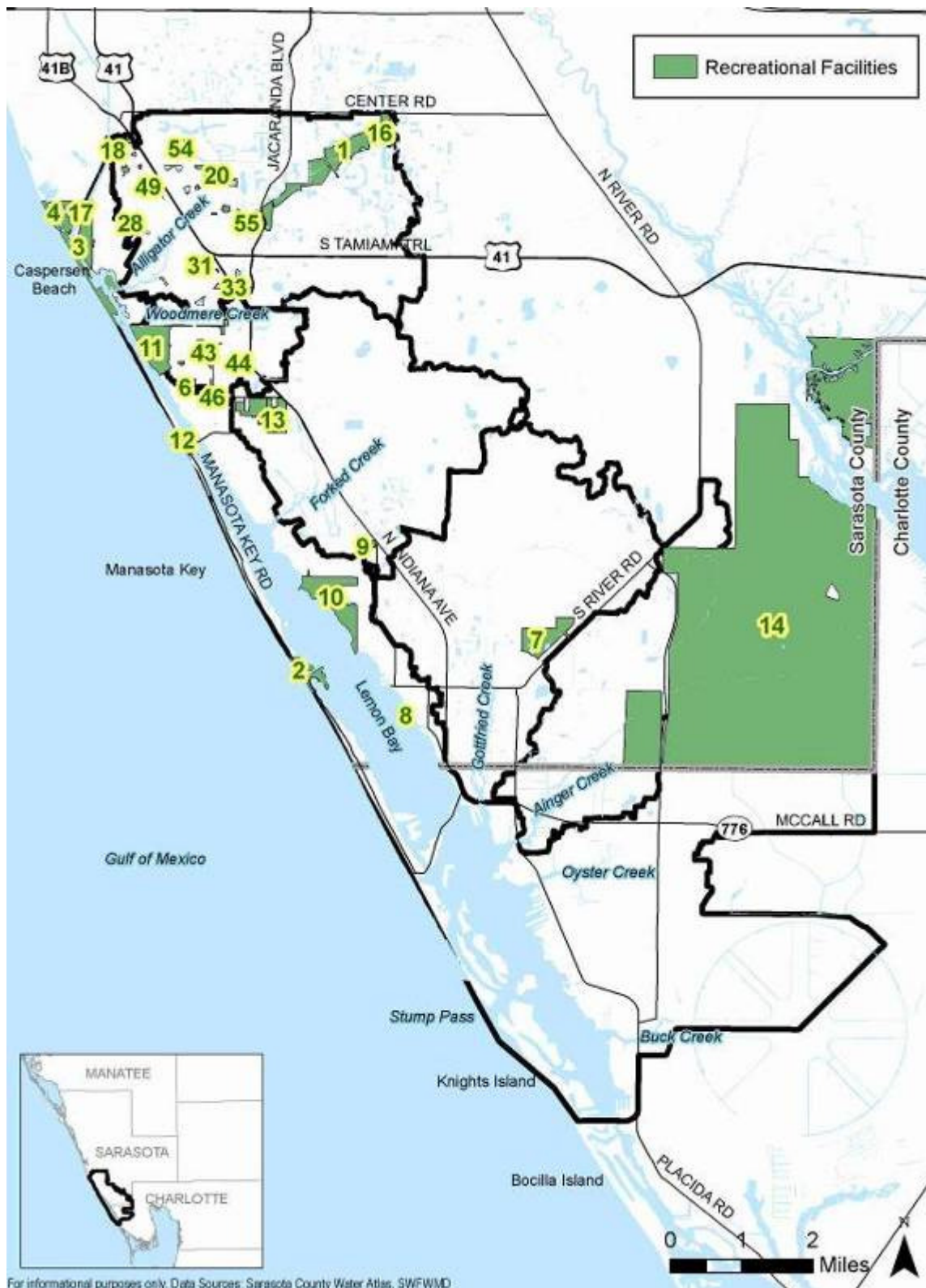


Figure 1-23 Lemon Bay Watershed Area Recreational Facilities



The program encourages people to interact with nature through enjoyable and hands-on activities. The NEST idea was initiated during the development of the Lemon Bay Ecosystem Restoration Project in 2001 as an opportunity for residents (neighbors, civic groups, student organizations) to actively work with land managers and restoration ecologists in restoring the native habitats of the preserve. During this initial project, citizens from the surrounding neighborhoods participated in water quality monitoring, fish sampling, a frog listening network, trash and invasive plant removal, native plantings, and a scrub-jay watch program.

In addition to Sarasota County, organizations such as SWFWMD, CHNEP, FDEP, University of Florida Institute of Food and Agricultural Sciences (UF/IFAS) Extension, and many small non-profit organizations play a key role in educational outreach in the Lemon Bay watershed area. Table 1-11 summarizes the various organizations and their respective educational outreach programs.

The following describes some of the partner public education programs:

- ❖ SWFWMD offers a multitude of training, incentives, grants, and educational materials. The SWFWMD educational website, www.swfwmd.state.fl.us/education/, offers free materials and expert speakers, current funding opportunities, and web activities that teach readers about watersheds, conservation, and water quality.
- ❖ Since 1996 CHNEP has awarded grants to support projects to improve community awareness. Educational projects submitted by Florida residents, organizations, businesses, government agencies, schools, colleges, and universities are supported. The projects vary greatly in scope and scale, ranging from curriculum development to environmental education activities and are distributed through the watershed.
- ❖ The UF/IFAS Extension program is a partnership between the University of Florida, State, Federal, and county governments to provide scientific knowledge and expertise to the public (UF/IFAS). The UF/IFAS County Extension in Sarasota offers a multitude of free educational courses to community related to natural resource sustainability, such as Florida Yards & Neighborhoods, the Master Gardener Program, and Rain Barrel Workshops.



Florida House - Photo from sarasota.extension.ufl.edu/fhlc/flahousehome.shtml

The UF/IFAS Extension Program has unique demonstration facility in Sarasota County. The Florida House Learning Center is a model home and landscape that demonstrates green building and sustainable living. It was originally conceived as an educational outreach for water conservation after a severe regional drought in the late 1980s and was organized by IF/IFAS and interested citizens. The Florida House features water and energy-conserving designs and devices, Energy Star® appliances, renewable resources such as cork flooring, recycled plastic carpet, and a “Model Florida Yard.” The Florida House is believed to be one of the first such educational demonstration facilities in the country (Florida House Learning Center History, 2007—<http://sarasota.extension.ufl.edu/FHLC/FLHouseHistory.shtml>).



Table 1-11 Public Outreach Programs

| Entity | Outreach Programs |
|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sarasota County Water Resources | NEST (Neighborhood Environmental Stewardship Team) voluntary association of people—neighbors, civic groups, student organizations, and others who want to better understand and improve environmental conditions in their watershed. |
| Sarasota County Environmental Services | Recycling (publication; community and school education) |
| | Discover Natural Sarasota County (publication) |
| | Keep Sarasota County Beautiful (Adopt-a-Road, Park, Pond, Shore, and Spot; portable pocket ashtrays, Bag-it-in-Your-Car-Day) |
| Sarasota County Access Sarasota | Public Service Announcements and County Talk (Comcast TV 19 / Verizon 32) |
| Sarasota County Citizens Academy | Improves communications between citizens and government; Fosters increased citizen involvement |
| Sarasota County Forestry Division | Neighborhood, Urban, and Canopy Road Tree Programs (design, selection and planting services) |
| Sarasota County Neighborhood Services | Grant Program (helps residents enhance their neighborhoods' character, value, safety, health and infrastructure) |
| | Neighborhood University Program (classes and workshops designed to inform residents of Sarasota County on how to improve and maintain their communities and neighborhoods) |
| Florida Department of Environmental Protection | Florida Yards (FloridaYards.org; a project of the Florida Springs Initiative) |
| | Green Lodging Facilities Program (recognizes and rewards environmentally conscientious lodging facilities) |
| | Clean Marinas Program (Clean Marina Designation status awarded to marinas and boatyards that demonstrate continued commitment and protection to the water and marine life. |



Table 1-11 Public Outreach Programs

| Entity | Outreach Programs |
|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Southwest Florida Water Management District | Florida Friendly Landscapes (education program that promotes the use of Florida-friendly landscaping to homeowners, builders, developers and landscape and irrigation professionals; partner to University of Florida's Florida Yards & Neighborhoods Program) |
| | Training (interdisciplinary water education programs including Project WET; Healthy Water, Healthy People; Great Water Odyssey; etc.) |
| | Funding (Mini-Grants, Community Grants) |
| | Web Activities (Learn about watersheds, Splash! Activities, Water quality monitoring) |
| | Educational materials (free publications and materials for adults and children including Water Matters, Water Matters Hispanic outreach, Florida Waters, Watershed Excursion, etc.) |
| | FARMS Program (Facilitating Agricultural Resource Management Systems), an agricultural best management practice cost-share reimbursement program involving both water quantity and water quality aspects; developed with the Florida Department of Agriculture and Consumer Services) |
| | Water Conservation Hotel And Motel Program (Water C.H.A.M.P.) (helps hotels and motels save water and money while practicing more efficient housekeeping and landscaping) |
| Entity | Outreach Programs |
| Other Non-profit Organizations | 1000 Friends of Florida, Science and Environment Council of Sarasota County, Florida House Institute, |
| Charlotte County National Estuary Program | Grant Program (Micro-grants and Educational Outreach Project grants—various projects) |
| | Field Trips (School Estuary Exploration, Seagrass Education, Sailing Through the Environment) |
| | Publications (Calendars, Harbor Happenings, Seagrass Annual Data Summary, technical reports) |
| | Workshops (Sea Turtles Adventure, Waters Edge and Landings Native Landscaping) |
| Lemon Bay League | Stakeholder meetings to identify priorities for watershed protection. |
| Lemon Bay Conservancy | Lecture Series (Visiting speakers present information about issues relevant to Lemon Bay; educational material provided to attendees) |
| | Field Trips (National Estuary Day Kayak Paddle) |
| Florida Native Plant Society (Mangrove Chapter) | Field Trips (occur monthly, location varies) |
| | Workshops (occur monthly; various topics and guest speakers) |



Table 1-11 Public Outreach Programs

| Entity | Outreach Programs |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Charlotte Harbor Environmental Center | Wet n' Wild Eco Camp (Lemon Bay/Englewood- features water & wetland education, wading trip, wilderness hiking, native plant and animal identification, field trip) |
| | Journey Through the Heart of an Estuary (participants take the role of a water drop in the Lemon Bay watershed and follow its Journey from the uplands to creeks and rivers and finally to the estuary) |
| | Guided Hikes (Alligator Creek Preserve or Cedar Point Environmental Park- guided walk with discussion about water issues, native wildlife, and their integral role in the balance of southwest Florida systems) |
| | Moms & Tots (monthly; various topics) |
| | Publications (Citizens Guides, Restoration Needs Assessment in the Charlotte Harbor and Lemon Bay Basins, and the Peace and Myakka River Basins, etc.) |
| University of Florida IFAS Extension | Florida Yards & Neighborhoods partners with national, state, and local agencies to teach Florida-friendly landscaping |
| | BMP Training meets the requirements of the Sarasota County Fertilizer Ordinance for landscape company employees who apply fertilizers. |
| | Master Gardener Program trains volunteer educators to provide information to Floridians about gardening, environmental horticulture, and pest management. |
| | Rain Barrel Workshops are classes on the construction and use of rain barrels and their environmental benefits. Sarasota County currently sells rain barrels for \$37 each after the class. |
| | The Florida House will re-open in Fall 2010. Florida House is a demonstration facility, which offers education classes and tours. |