

**Catfish Creek
Basin Master Plan Update
Central County Model (D_ccm)**

Book 1 of 3

Basin Summary

July 2001

**Catfish Creek Basin
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List of Exhibits

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- EXHIBIT 1. Basin Locator Map
- EXHIBIT 2. Basin Map
- EXHIBIT 3. 100-Year Floodplain with structure FPLOS Deficiencies
- EXHIBIT 4. 100-Year Floodplain with street FPLOS Deficiencies
- EXHIBIT 5. Subbasin/Node-Reach Map

SECTION 1. INTRODUCTION

1.01 Purpose

The Catfish Creek Basin Master Plan (BMP) was prepared to (1) characterize the existing hydrologic/hydraulic network; (2) identify existing Flood Protection Level of Service (FPLOS) deficiencies; (3) delineate the existing 100-year/24-hour floodplain to guide future planning and development; and (4) comment on the existing water quality conditions.

1.02 Abbreviations

BMP	- Basin Master Plan
BMPU	- Basin Master Plan Update
CIP	- Capital Improvements Program
DRI	- Development of Regional Impact
EMC	- Event Mean Concentration
FAC	- Florida Administrative Code
FDEP	- Florida Department of Environmental Protection
FDOT	- Florida Department of Transportation
FEMA	- Federal Emergency Management Agency
FPLOS	- Flood Protection Level of Service
ICW	- Intercoastal Waterway
LOS	- Level of Service
NPDES	- National Pollutant Discharge Elimination System
PLRG	- Pollutant Load Reduction Goal
SBNEP	- Sarasota Bay National Estuary Program
SWFWMD	- Southwest Florida Water Management District
TMDL	- Total Maximum Daily Load
WMM	- Watershed Management Model
WQLOS	- Water Quality Level of Service

1.03 Description of Study Area

The Catfish Creek drainage basin is located in the central portion of coastal Sarasota County as shown in Exhibit 1. The basin is approximately 3,982 acres in size and extends south from the area of Ashton and McIntosh Roads, across Clark Road, to the intersection of U.S. 41 and South McIntosh Road. The Catfish Creek Basin is bordered by the Phillippi Creek basin to the north, Matheny Creek, Elligraw Bayou, and Holiday Bayou basins to the west, the North Creek Basin to the south, and the South Creek basin to the east. The Seminole Gulf Railroad intersects the basin from northwest to southeast. The area south of Clark Road is primarily residential, including the subdivisions of Huntington Pointe, Deer Creek, Prestancia, Country Club of Sarasota, Marbella, Wellington Chase, and Turtle Rock. The area north of Sawyer Loop and North Ridge Road is primarily industrial, open space and wetlands, medium density residential, and institutional. The Clark Road Corridor, between McIntosh Road and Gantt Road is

included in the Catfish Creek Basin. Topographic relief in the basin is very low, ranging from elevation 39 in the northeastern portion of the basin to nearly sea level at the mouth of the Creek. The basin drains from north to south through the Palmer Ranch and ultimately discharges into Little Sarasota Bay. A map of the basin with the major conveyance channels is shown in Exhibit 2.

The Catfish Creek basin is over 75% developed, with the remaining area expected to be developed within the next 5 to 10 years.

According to Chapter 62-302.600 of the Florida Administrative Code (FAC) and County Ordinance 72-37, Catfish Creek is categorized as Class III surface waters. This designation is assigned to “waters used for recreation, propagation and maintenance of a healthy, well-balanced population of fish and wildlife”.

SECTION 2. BACKGROUND

2.01 Historic Perspective

Historic Catfish Creek extended from Little Sarasota Bay east and north to an area approximately 1000 feet east of what is now U.S. 41. Subsequent drainage works for agriculture and mosquito control deepened the historical creek and extended it northward to connect and drain large low-lying areas. In addition, a north-south ditch was constructed through what is now the Palmer Ranch DRI, to North Creek, along the east sides of Sections 15, 22, and 27 Township 37 South Range 18 East.

2.02 Historic Flooding

The Country Club of Sarasota has experienced chronic and severe flooding. Although no structures in the Country Club of Sarasota have experienced flooding, street flooding has been extremely severe. Prior to the stormwater infrastructure improvements undertaken by the Palmer Ranch between 1986 and 1989, street flooding was approximately 3 feet deep and lingered for up to a week following large storm events.

Areas that have historically been susceptible to flooding typically correspond to soils defined as either depressional or frequently flooded by the Sarasota County Soils Survey. Other than the Country Club of Sarasota, most development that has occurred in lower Catfish Creek has occurred outside of these historically low-lying areas.

In contrast, the majority of soils in the upper Catfish basin are listed as poorly to moderately drained, which can partially explain the greater flooding incidence. The Clark Road/Sarah Avenue area and the Deacon Place Industrial Park have had a history of street and structure flooding.

To reduce the potential exacerbation of the Clark Road flooding, the Clark Road Corridor Plan currently restricts the peak discharge from new development such that the post-development 100-year event peak discharge cannot exceed the pre-development 2-year event peak discharge. The Clark Road Corridor Plan restrictions will remain in effect until the construction of a capital improvement project that reduces flooding below FPLOS levels.

2.03 Prior Studies

The Catfish Creek basin has been the subject of two previous studies. A list and brief descriptions of these previous studies is provided below:

1. July 1988 – Catfish Creek Watershed Study

This privately initiated study was prepared by Smally, Wellford and Nalven, Inc. as a basis of review for the Palmer Ranch, DRI. This study was approved and utilized as the stormwater basis of review for the Palmer Ranch DRI by both Sarasota County and the Southwest Florida Regional Planning Council. It is still being utilized in that

capacity. Much of the information as it relates to the Palmer Ranch properties was used in this study.

2. September 1992 – Upper Catfish Creek Sub-Watershed Study

Sarasota County Stormwater Utility commissioned Kimley-Horn and Associates to perform this drainage study as part of the Clark Road Corridor Study. In the study, 12 recommendations were made for improvements to alleviate chronic flooding problems occurring in the study area. The recommendations were targeted to eliminate flooding in a 25-year, 24-hour storm, and included the construction of two stormwater storage facilities, 3 improvements along Clark Road, and 7 other improvements.

SECTION 3. EXISTING CONDITIONS ASSESSMENT

3.01 Flood Protection Level of Service Objectives

The flood protection level of service (FPLOS) objectives applied to the Catfish Creek Basin are based upon those adopted by the Sarasota County Comprehensive Plan. Table 3.01 presents the FPLOS standards for Sarasota County.

**Table 3.01
Acceptable Flooding Depths
Flood Plain Level of Service Criteria**

	Rainfall Event Return Period			
	5-year	10-year	25-year	100-year
Structure	None	None	None	None
Roadways:				
Evacuation Route	None	None	None	None
Arterial	None	None	None	6 inches
Collector	None	None	6 inches	9 inches
Neighborhood	None	6 inches	9 inches	12 inches

To quantify the existing FPLOS deficiencies in the Catfish Creek Basin, a detailed hydrodynamic computer model was developed to predict flood elevations throughout the watershed. Versions 2.11 and 2.2 of the Advanced Interconnected Pond Routing (AdICPR) software were used to model the watershed. Though originally developed separately, the upper and lower sections of Catfish were joined and the model was run for the entire Catfish Creek basin. For a complete discussion of the modeling methodology, please refer to the *Phillippi Creek Basin Master Plan Update*. Information from the latest Palmer Ranch watershed model was reviewed and incorporated into the updated model, as applicable. The recently completed improvements associated with the Palmer Ranch subdivisions and Clark Road were also incorporated into the analysis as an existing condition. Additional detail was also added for the Vamo area. Copies of the computer input as well as the node-reach diagram are available in digital format upon request from the Stormwater Utility. The node-reach diagram is also attached as Exhibit 5.

As there were no records of stream-flow or stage data within the Upper Catfish Creek area, the upper portion was not calibrated, but relies upon accurate calibration of the lower Catfish area. Though the USGS had a monitoring station near the outfall of Catfish Creek from 1991 to 1994, the site was too far downstream to be used for calibrating the upper portion of the model.

The computed flood elevations were used to delineate the horizontal limits of the 100-year floodplain on Southwest Florida Water Management District (SWFWMD) 1-foot contour interval aerial maps. Structures and roadways which fell within the horizontal limits of the floodplain were inventoried as potential FPLOS deficiencies. Roadway FPLOS deficiencies were determined by comparing roadway elevations from SWFWMD aerials, construction plans, or field surveys, to the computed flood levels. Finished floor elevations of structures

horizontally located in the 100-year floodplain were field surveyed to verify which constituted FPLOS deficiencies.

3.01.1 Flood Protection Level of Service

The results of the existing conditions assessment indicate that there are numerous structure and street FPLOS deficiencies in the Catfish Creek Basin. Exhibit 3 identifies the horizontal limits of the 100-year floodplain and shows the locations of structure FPLOS deficiencies. Exhibit 4 identifies the horizontal limits of the 100-year floodplain and shows the locations of street FPLOS deficiencies.

There are twelve structure FPLOS deficiencies in Catfish Creek. Three are on the north side of Clark Road near the Sarah Avenue Industrial area, eight occur on the south side of Clark Road, in the Deacon Place Industrial area, and the remaining structure is in the Cox Lumber complex between McIntosh Road and the railroad. The structures are identified in Table 3.01.1.

**Table 3.01.1
Structure Flood Protection Level of Service Deficiencies**

Structure Location	Structure Type	Finished Floor Elevation	Node No.	Flood Stage 10-Year	Flood Stage 25-Year	Flood Stage 100-Year
6345 McIntosh Road	Business	21.92	61030	21.92	22.11	22.29
6020 Deacon Road	Business	24.91	62010	25.02	25.14	25.31
6060 Deacon Road	Business	24.80	62010	25.02	25.14	25.31
6043 Deacon Road	Business	24.68	62020	25.08	25.24	25.45
6057 Deacon Road	Business	24.65	62020	25.08	25.24	25.45
6071 Deacon Road	Business	24.95	62020	25.08	25.24	25.45
6085 Deacon Road	Business	24.60	62020	25.08	25.24	25.45
6015 Deacon Place	Business	25.20	62030/20	25.18	25.37	25.65
6029 Deacon Place	Business	25.45	62030/20	25.18	25.37	25.65
4571 Clark Road	Business	27.4	62040	27.25	27.47	28.04
4583 Clark Road	Business	27.67	62040	27.25	27.47	28.04
5640 Sarah Ave	Business	30	62250	29.86	30.15	30.64

Shaded flood stages indicate structure flood depths exceeding LOS criteria

There are also ten public streets, total of fourteen public street segments, including evacuation route, arterial, and local streets, that experience FPLOS deficiencies. All of the areas experience flooding above level of service limits in the 10, 25, and 100-year storms. A list of the effected streets is shown in Table 3.01.2. In addition, several local private streets within the Country Club of Sarasota are susceptible to flooding in excess of the FPLOS criteria and are detailed in Table 3.01.3.

**Table 3.01.2
Public Street Flood Protection Level of Service Deficiencies**

Public Street Location	Road Class	Edge of Pavement Elevation	Node No.	Flood Stage 10-Year	Flood Stage 25-Year	Flood Stage 100-Year
Deacon Place	Local	23.54	62020	25.08	25.24	25.45
Deacon Road	Local	22.96	62020	25.08	25.24	25.45
Clark Rd @ Sarah Ave	Evacuation	26.83	62040	27.25	27.47	28.04
Sarah Ave @ Clark Rd	Local	26.04	62040	27.25	27.47	28.04
Clark Rd, E of Sarah Ave - W of Clark Center Ave	Evacuation	26.49	62070	27.06	27.44	28.04
Sawyer Loop @ Clark Rd	Collector	26.05	62180	26.92	26.93	27.10
Clark Rd E of Jason Lee Pl	Evacuation	26.49	62200	27.00	27.45	27.70
Ashton Rd @ NE Sarasota Middle School	Collector	36.70	62680	37.48	37.52	37.59
Summerwood Court	Local	35.96	62680 /62600	37.05	37.14	37.28
Clark Rd @ Honore Ave	Evacuation	33.72	64240	33.67	33.70	33.91
Honore Ave @ Clark Rd	Arterial	33.36	64240	33.67	33.70	33.91
Honore Ave, 400' N of Clark	Arterial	33.36	64315 /64240	34.65	34.72	34.93
Old Ashwood Dr - (Unit 2)	Local	36.10	64440	37.02	37.31	37.84
McIntosh Road	Arterial	20.00	61030	21.92	22.11	22.29
Shaded flood stages indicate street flood depths exceeding LOS criteria						

**Table 3.01.3
Private Street Flood Protection Level of Service Deficiencies**

Private Street Location	Road Class	Edge of Pavement Elevation	Node No.	Flood Stage 10-Year	Flood Stage 25-Year	Flood Stage 100-Year
Country Club of Sarasota						
Torrey Pines Way	Local Road	15.79	60448	15.80	16.30	17.01
Prairie Dunes Drive	Local Road	15.61	60445	16.13	16.29	16.61
Prairie Dunes Drive	Local Road	15.62	60448	15.80	16.30	17.01
Spy Glass Hill Road	Local Road	15.49	60437	15.67	15.98	16.55
Spy Glass Hill Road	Local Road	15.45	60447	15.30	15.80	16.55
Spy Glass Hill Road	Local Road	15.54	60445	16.13	16.29	16.61
Shaded flood stages indicate street flood depths exceeding LOS criteria						

3.02 Water Quality Level of Service Objectives

The Sarasota Bay National Estuary Program (SBNEP) established Pollutant Load Reduction Goals (PLRGs) of 7% for nitrogen and 27% for metals. Since the PLRGs are for the entire Sarasota/Little Sarasota/Drymond Bay watershed, they do not necessarily apply to just the Catfish Creek basin.

3.02.1 Water Quality Level of Service (WQLOS)

A summary of the existing conditions model output for the conventional non-point source pollutants, nutrients, and metals is listed in Table 3.02.1. The gross pollutant load reflects the total estimated amount of pollutant load that is generated in the basin. Net annual pollutant load, as presented in Table 3.02.1, is defined as the amount of estimated pollutant discharged into the final receiving waterbody. Net load calculations take into account the mitigating effect of existing stormwater treatment facilities and wetlands. The non-point source pollutant load calculations are based strictly on land use configuration and the estimates have not been calibrated with actual sampling data.

**Table 3.02.1
Total Annual Pollutant Loads for Existing Conditions**

Parameter	Gross Load (lbs/year)	Pollutant Removal		Net Load (lbs/year)
		(lbs/year)	(%)	
Biochemical Oxygen Demand	178,398	30,689	17	147,709
Chemical Oxygen Demand	1,314,735	258,090	20	1,056,645
Total Suspended Solids	2,858,459	1,039,888	36	1,818,571
Total Dissolved Solids	2,241,257	560,356	25	1,680,901
Total Phosphorus	5,307	1,301	25	4,006
Total Dissolved Phosphorus	2,647	767	29	1,880
Total Kjeldahl Nitrogen	22,751	3,925	17	18,826
NO ₂ + NO ₃ Nitrogen	6,794	1,506	22	5,288
Total Lead	2,135	749	35	1,386
Total Copper	898	302	34	596
Total Zinc	1,954	499	26	1,455
Total Cadmium	35	14	40	21

Any new development within the drainage basin is required to include stormwater treatment facilities to mitigate potential increases in pollutant loads as required by the Sarasota County Land Development Regulations. The construction of a CIP project may result in substantial water quality benefits for Catfish Creek by providing some treatment for approximately 125 acres of currently untreated runoff from the upper basin.

SECTION 4. CONCLUSIONS AND RECOMMENDATIONS

4.01 Delineation of Existing Floodplain

As part of the Catfish Creek BMP, the limits of the 100-year riverine floodplain have been identified and mapped, and is shown on Exhibit 3 and Exhibit 4. Exhibit 3 includes the floodplain with the structure FPLOS deficiencies and Exhibit 4 includes the floodplain with the street FPLOS deficiencies. Adoption of the Catfish Creek BMP will assure that these floodplain areas will be recognized and that the floodplain will be preserved when new development proposals are considered. In addition, the detailed stormwater model developed as part of the BMP provides a valuable tool to evaluate the effects of proposed land use changes.

It should be noted that the Palmer Ranch DRI area has an adopted stand-alone watershed model that has previously been approved by the Board of County Commissioners as part of their Master Development Order. The Palmer Ranch is required to use this model to show no net increase in offsite flood stages (either upstream or downstream) prior to approval of any new developments on the Palmer Ranch. The area subject to this “no-rise” Development Order condition is identified on Exhibit 3 and Exhibit 4 in orange.

It is recommended that the Catfish Creek model update be utilized as a basis of review to evaluate proposed development and drainage modifications so that potential adverse increases in off-site flood stages are adequately mitigated. In addition, it is recommended that finished floor elevations be set a minimum of one foot above the 100-year flood elevations computed by the Catfish Creek Flood Study Update, if such elevations are higher than the base flood elevations contained on the current Flood Insurance Rate Maps.

4.02 Preliminary Investigation of Existing FPLOS Deficiencies

As indicated previously in Section 3, several structure and street FPLOS deficiencies exist in the Catfish Creek Basin. A preliminary investigation of the cause and potential solutions for each is provided below:

Structure and Public Street Flooding

A project composed of four improvements is recommended to remove the twelve structures from the 100-year floodplain, reduce flooding on Clark Road, and reduce or eliminate flooding on other arterial, collector and local roads. This grouping of projects is designated as Alternate 1 in the Parsons Engineering Science report Catfish Creek Regional Stormwater Facility Conceptual Design Alternative Analysis. The recommended project includes the following improvements:

- Creation of a treatment and detention facility south of Deacon Road
- Modification of FDOT pond #2 and the installation of additional culverts under the railroad tracks

- Construction of a treatment and detention facility north of Clark Road, east of Jason Lee Place
- Improvements to the pipe system along and across Clark Road.

The Stormwater Capital Improvement Section is currently evaluating these recommendations and is pursuing land acquisition for the storage facilities.

Private Street Flooding

Potential causes of the FPLOS deficiencies associated with local, private roads in the Country Club of Sarasota include the equalizer pipes between ponds located throughout the subdivision. The pipe between the lakes represented by nodes 60448 and 60447 creates approximately 0.5 foot of headloss for the 100-year design storm. The pipe between the lakes represented by nodes 60442 and 60441 also creates approximately 0.5 foot of headloss for the 100-year design storm. In addition, the pipe between the lakes represented by nodes 60445 and 60444 creates approximately 0.20 foot of headloss for the 100-year design storm. It is recommended that replacing these connections with larger or additional pipes should be evaluated in terms of ability to reduce street flood depths in conformance with the FPLOS standard.

A second alternative that should be evaluated for alleviating street FPLOS deficiencies would be to operate the final outfall weir to Catfish Creek at a lower elevation during the wet season.

These potential solutions to the existing FPLOS deficiencies have been shared with the Country Club of Sarasota and the adjacent TPC Golf Course.

4.03 Future Development

The construction of capital improvements will provide benefits to property owners of undeveloped land in two ways. First, flood stages will be reduced on undeveloped land, which will remove portions of undeveloped land from the floodplain, while areas remaining in the floodplain will have a reduced depth of flooding. Developers of these areas will have less floodplain encroachment for which they must provide floodplain compensation. Second, following construction of an effective project, restrictions imposed on the Clark Road Corridor would be released and discharge rates from new development would no longer be limited to the 2-year pre-developed peak discharge.

4.04 Long Term Maintenance

As indicated in Section 2, the drainage infrastructure in lower Catfish Creek is located in previously platted areas of the Palmer Ranch DRI. As such, public easements and rights-of-way have already been dedicated to the County. Drainage infrastructure located in upper Catfish Creek is mostly contained within dedicated easements, with the exception of the industrial areas. The Drainage Operations Division is in the process of negotiating for drainage easements over the drainage system north of Clark Road in order to ensure consistent

maintenance of the upstream ditch section. Further easement acquisition should be pursued in order to ensure consistent maintenance, reducing erosion.