

EXECUTIVE SUMMARY

The Delaney Creek Area (DCA) watershed drains approximately 33.7-square miles of land located in the eastern portion of Hillsborough County. The DCA watershed is generally bordered by Valrico Road on the east, by the Hillsborough Bay on the west, by the CSX railway on the north and by Riverview Drive on the south. The watershed is divided into four sub-watersheds within the project area. The runoff of the entire watershed ultimately discharges into the Hillsborough Bay. The watershed can be characterized as urban in the northern sections of Brandon, Clair Mel and Progress Village and somewhat rural in its southern and western portions. Land uses are varied. Of the total 21548.80 acres in the watershed, residential land uses constitute the largest portion at about 22.63% or 4876.142 acres. With almost the same total are the combined natural systems areas with 22.62% or 4874.516 acres. This total can be further broken down into upland forests - 2275.098 acres or 10.56 %, wetlands - 1446.748 acres or 6.71 % and water - 1152.67 acres or 5.35 %. Next comes agriculture with 17.32 % or 3732.451 acres. Open land makes up 15.46 % or 3330.668 acres. Combined commercial, light industrial and institutional land uses equal 2437.371 acres or 11.31%. Highways and utility corridors comprise 6.26 % or 1349.148 acres. Extractive / mining land use occupies 803.308 acres or 3.73 %. Finally, recreational land uses contain 145.158 acres or 0.67 %.

The study is broken up into two broad categories, flood control / water quantity and natural systems / water quality. One purpose of the flood control portion of the study is to develop a computer simulation model of the Delaney Creek Area watershed under current conditions. The calibrated model is also used to develop a Watershed Management Plan (WMP) for the DCA watershed. The objective of the plan is to determine level of service for existing stormwater infrastructure and to develop alternatives and recommendations for improving the conveyance system to eliminate any flooding situations.

Hillsborough County developed initial reports of Delaney Creek Stormwater Management Plan in 1986 and Archie Creek / Coastal Areas and Buckhorn Creek Watershed Stormwater Management Plan in 1988. The 1986 and 1988 SMMPs prepared by Ghioto, Singhoffen & Associates, Inc. for the SWFWMD Alafia Basin Board paved the foundation for the current study. Additional to data collection during the preparation of the 1986 and the 1988 reports, drainage improvements completed by the County between 1986 and present have been revised as well as taking into consideration of system entrance and exit headloss.

The peak stages computed by the model at Delaney Creek Area near Darlington Avenue of the Delaney Creek main channel, the downstream side of 78th Street of the North Archie and Archie Creek main channel were calibrated and verified with USGS gage station data. The development of the proposed Watershed Plan also includes the future Falkenberg Road extension, Cargill gypstack addition including the channel diversion of North Archie Creek, and Canterbury Lakes Regional Detention Facility improvements based on approved construction plans.

There are several target areas for the recommended improvements in this study based on model prediction, verification of field investigation and the two public meetings during the development of the watershed management plan:

Delaney Creek Sub-Watershed:

- The Delaney Creek Area system recommended improvements of the main channel include the addition of a 8'x12' CBC at U.S. 41, channel cross section improvement from the Bay to Causeway Boulevard, and structural upgrade at Maydell Drive. This improvement will lower the water surface elevation between U.S. 41 to Causeway Boulevard during the 25-year design storm event and help reducing the tail-water condition for the Clair Mel City Subdivision which will enhance the County's completed projects.
- The Tributary "A" system recommended improvements include channel improvement through the whole length of the tributary, and upgrade the entire drainage system at Maydell Drive.
- The Clair Mel City system recommended modifications: upgrade structures at Tidewater Trail, Robindale Road for Lateral A and Tidewater Trail, and the two crossings of Rideout Road. Regrade channels for both Lateral A and Lateral B.
- The business area of Bay Plaza will have structural upgrade at Palm River Road and an additional box culvert under Adamo Drive.
- The Heather Lakes Subdivision will have a structural upgrade of a dual 38" x 60" ERCP at all driveway crossings of the Lumsden Ditch on the north and south side of Lumsden Avenue from Pauls Drive and Kings Avenue.

Delaney Popoff Canal Sub-watershed:

- The Main channel will have a structural upgrade of a 6' x 10' CBC at Old U.S. Highway 41A and a dual 72" RCPs at 78th Street and the addition of a 5' x8' CBC at Madison Avenue. Channel improvements are recommended with new cross sections at approximately 1650 feet south and 1700 feet north of Madison Avenue. Also, cross section channel improvements downstream and upstream of 78th Street are recommended.
- The area of Sanson Park will benefit from a proposed pond that will be constructed just south of Sanson Park. A new subdivision called Canterbury Lakes will have 50 acres detention pond to collect its own and a portion of Sanson Park's runoff to alleviate the flooding problems. Also, channel improvements is recommended behind the back lots of Libby Lane.
- The Fortuna Acres subdivision will have their whole conveyance system upgraded with a 3.5'x6' CBC at Palm Drive, a 3' x 3.5' CBC at a driveway located west of 74th Street South. In addition,

the channel will be improved with new cross sections between 74th Street and Palm Drive and from Palm Drive to the Fortuna Acres pond. The Fortuna Acres pond will have a 25 feet outfall weir that will discharge out to the Delaney Popoff Main Canal near Madison Avenue.

- The Evergreen Estates will have a structural upgrade of a 4' x 8' CBC at U.S. Highway 41. Also, the channel will be improved with new cross sections approximately 600 feet upstream and 2700 feet downstream of the upgraded structure at U.S. Highway 41.

North Archie Creek Sub-watershed:

- The Main channel will have a structural upgrade at U.S.41 by adding a 5'x10' CBC.
- A dual 60" RCP storm sewer system will be constructed under Endive Avenue to connect with Tributary B and Tributary A at 78th Street.
- A bypass channel will be constructed from the outfall of Tributary A at the Main channel to meet with 78th Street near an office complex. The structures under this location of 78th Street will be upgraded to dual 60" RCPs.

Archie Creek Sub-watershed:

- The structure under 78th Street just South of the TECO right-of-way will be upgraded to a 36" RCP. Also, 400 feet of the channel downstream of the upgraded structure will be improved.
- The structures under Mint Julip Drive of the Ashley Oaks subdivision will be upgraded to 36" RCPs and channel improvements will occur about 3375 feet downstream of the west Mint Julip Drive. In addition, the structure under Krycul Avenue will upgrade to a 42" RCP.

In conclusion, these proposed improvements would achieve the 25-year/24-hour Level B of Level of Service along the major conveyance of the Delaney Creek Area Watershed.

The water quality / natural systems portion of the plan evaluates the existing conditions for both criteria. Water quality data was gathered primarily from the Environmental Protection Commission's sampling data that has been done on Delaney Creek since 1976. In the Florida Department of Environmental Protection's 1996 305b report, Delaney Creek was rated as having the worst water quality of any stream in the Tampa Bay watershed. This was no longer the case in the FDEP report two years later; however, it did not indicate where the stream presently stands. Review of the EPC data shows that there is a steady and slight improvement of the creek's water quality. This is probably directly attributable to the implementation of stormwater treatment practices since 1984. Another measure of water quality is the Trophic State Index (TSI). This system is used to directly compare one stream to another using the parameters of chlorophyll a, total phosphorus and total nitrogen. A TSI less than 45 indicates good water quality, between 45 and 60 is fair and greater than 60 is considered poor. For years where the TSI could be calculated, it was in the poor range, up until 1996 and 1997 where

the TSI was in the fair range. This trend appears to be continuing on a trend of improving water quality. Coliforms continue to be a problem in the watershed and this is not too surprising given the amount of dairies and septic tanks. Water quality areas of concern are the protection of the watershed's lakes and streams through education and regulation. Low impact development measures should be explored. The County should continue in its efforts to "hold the line" on nitrogen loadings to the Bay.

Recommendations include:

- The removal of vegetation and excavated soils from the system when the County is doing its maintenance in the watershed's ditches and streams will remove a source of pollutant loading, especially nitrogen to the Bay.
- Any reshaping of channels should include the creation of gentler side slopes to facilitate mowing / vegetative removal and to decrease the possibility of erosion.
- Stormwater ponds built by the County should employ the SWFWMD's Conservation Method of stormwater treatment that employs a permanent pool and increased residence times.
- The STREAMWATCH program should be used to assist in the development of specific event mean concentration values that can be used to verify the water quality computer modeling that was employed in this plan.
- Water flow information needs to be collected in conjunction with the EPC's data to further refine the estimation of pollutant loads. This should be done in partnership with EPC and the United States Geological Survey or the Southwest Florida Water Management District.
- Along with holding the line on nitrogen, the re-establishment of oligohaline habitat is a goal of the TBEP. At least one five acre project should be undertaken every five years to aid in this restoration.
- Adopt-A-Pond equipment should be for small-scale restoration projects, if available.
- A study should be undertaken to identify areas where coliform bacteria will be a high risk and develop a systematic plan to treat these "hot spots".
- Assimilative capacity studies should be conducted on the watershed's major lakes and this information should be used to develop lake management plans.

The evaluation of natural systems is the second portion of the environmental part of the plan. Some natural systems such as sand pine scrub have been completely eliminated from the watershed. This is due to the ease of development of this ecosystem for citrus and housing due to the lack of wetlands and a low water table. Overall, natural systems have declined to around 5949.42 acres or 27.61% of the watershed, if some of the rangeland land uses are included. The only "natural system" type that has increase in acreage is the open water category that has increased from 363.15 to 1152.67 acres,

primarily through the digging of borrow pits / reservoirs. Listed species also fall into this section. Because most of the critical upland habitat such as sand pine scrub and sandhills have been eliminated in the watershed, most of the listed species are those that can utilize the remaining wetland areas such as the long-legged wading birds - herons, egrets, ibis, limpkin, spoonbill, wood stork and sandhill crane. Several estuarine species are also included - brown pelican, American Oystercatcher, black skimmer, least tern and West Indian manatee. The prominent reptiles include indigo snake, gopher turtle and American alligator. There is a possibility of thirteen listed plants in the watershed, three ferns, three orchids, two lilies, two bladderworts, an aster, a clubmoss and a cactus. The County's ELAP program has bought one small parcel in the watershed, approximately 7 acres. Much of the mapped Significant and Essential Wildlife habitat is in the coastal or western portion of the basin. Areas of concern for natural systems are restoring upland habitat and preserving the remaining natural systems.

Recommendations include:

- Expanding existing programs such as the Pepper Busters and the Adopt-A-Pond program to assist in the removal of nuisance and exotic vegetation in the watershed
- Initiate a control plan for the nutria that have been observed in the watershed. These highly destructive aquatic rodents should be controlled while their numbers are still relatively small.
- Undertake a project to restore ten acres of ecologically significant uplands every five years
- Take advantage of less than optimal habitat for listed species in the watershed.
- Design a stormwater treatment / habitat restoration project for the Madison Avenue site that ELAPP presently has under its consideration.
- Develop a GIS based habitat tracking system to assist in the development of habitat corridors using ELAPP parcels and wetland mitigation bank or areas.
- The borrow pit in subbasin 290500 in the Archie Creek watershed has been shown to be an important stop-over area for shorebirds migrating through the watershed. The County should explore the possibility of acquiring the parcel and managing it for shorebirds and stormwater treatment.

Water supply is another aspect of the environmental plan. Recommendations include:

- Consideration of aquifer recharge potential when siting stormwater treatment facilities.
- The use of injection wells to slow or stop the saltwater intrusion into the freshwater aquifers. The use of potable, reclaimed and treated stormwater should be considered.
- The County's LAKEWATCH and STREAMWATER WATCH programs should encourage water conservation and reclaim water reuse.

The environmental portion employs a Pollutant Loading and Removal computer model to estimate the pollutant loading on the subbasin level and to determine the water quality treatment level of service (WQTLOS). The model predicts loadings for all the NPDES parameters – biological oxygen demand (BOD), total suspended solids (TSS), total Kjeldahl nitrogen (TKN), nitrates / nitrites (NO_x), total nitrogen (TN), total phosphorus (TP), total dissolved phosphorus (TDP), oil and grease, cadmium (Cd), copper (Cu), lead (Pb) and zinc (Zn). The model first calculates the load for all subbasins as if they were not receiving any stormwater treatment. Next the actual stormwater best management practices, if any, are determined for each subbasin. This information is input into the model and net loads are calculated. Next the model calculates the loading for the watershed, assuming that all the subbasin are in the benchmark condition, untreated low to medium density residential land use. This result is compared to the net loads and a ratio is created. This ratio is then used to assign the WQTLOS. One lesson learned by using the model is the impact of impervious area on the watershed. It has been shown that when 10 to 15% of a watershed is covered by impervious structures, water quality begins to seriously degrade. Recommendations include:

- The development of a method to track the amount of impervious surface in the watershed and explore the possibility of reducing some of the impervious area required to be built in the Land Development Code.
- Work with the Planning Commission and the SWFWMD to standardize their respective land use designations.
- The model should be continuously updated with “as-builts” submitted in electronic format by the developer.
- Expand the number of land use categories that the PLRM can analyze. This is especially important in the agricultural land use where there can be a wide range of loadings due to the type of activity.

Finally, the plan includes a maintenance plan and a monitoring plan. The maintenance plan uses the Community Rating System as its basis. By concentrating on these issues, it is hoped that the County and its citizens will be able to benefit by lowering the flood insurance premiums for the County. The maintenance plan describes current maintenance program elements and gives an overall program assessment. Recommendations include:

- The development of an inventory and mapping system to assist in the planning and scheduling of maintenance activities.
- Incorporation of the inspection and maintenance records into the inventory system.
- Increase the County’s efforts to fully staff the budgeted and approved positions.
- Implementation of the use of the updated Hansen system and the concurrent revision of maintenance

standards.

- Consideration of developing a leasing program for additional equipment that can be shared by the various maintenance units.
- Expand public education to inform the public about maintenance zones and schedules.
- Aggressively enforce the requirements of the County's MS4 NPDES permit regarding illicit discharges, which includes the development of an in-house training program for inspectors.
- Continue to monitor facilities not owned by the County and notify the owner as to needed maintenance (FDOT, railroads, etc.).