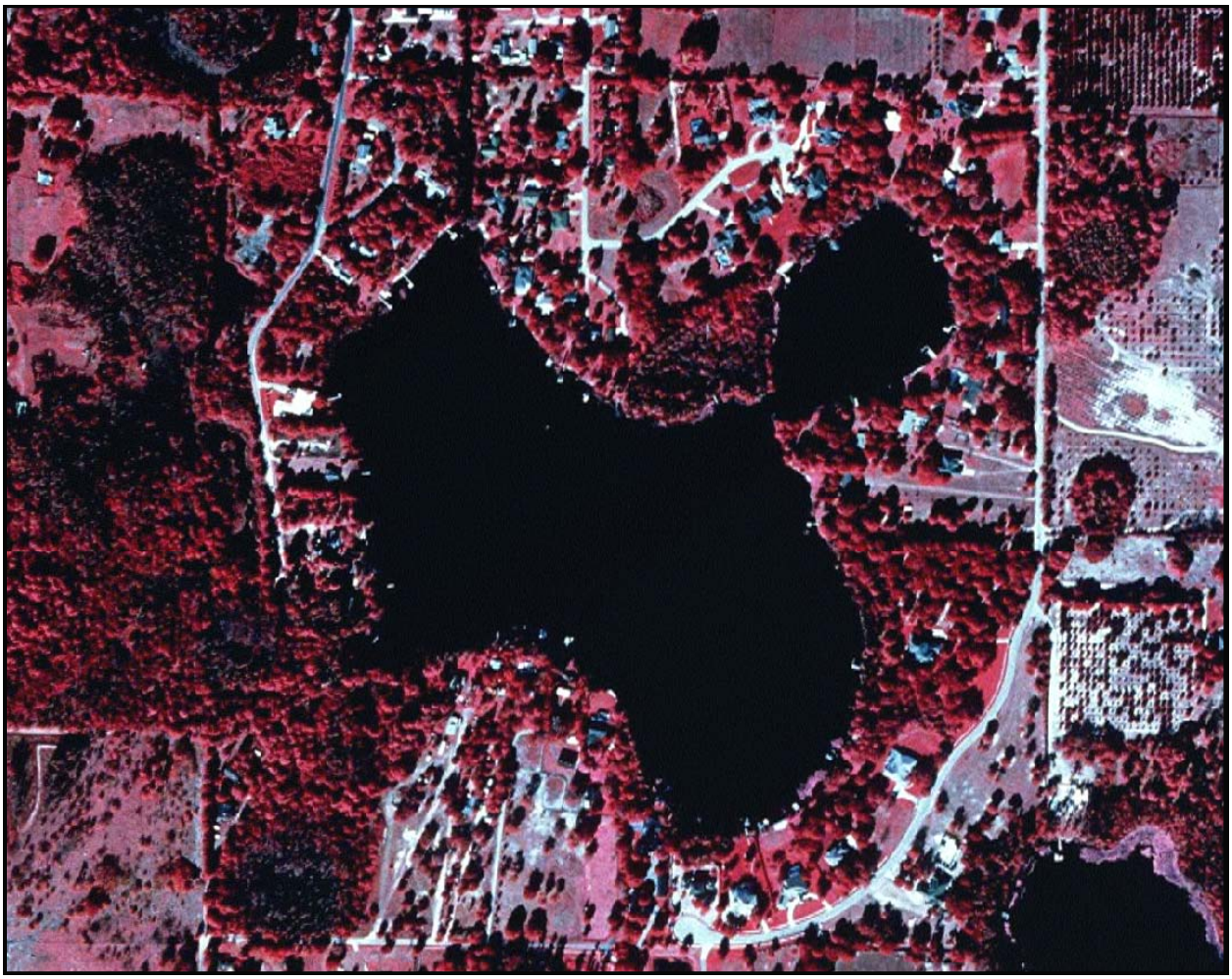
Minimum and Guidance Levels for Lake Taylor in Hillsborough County, Florida



August 19, 2004 Draft

Ecologic Evaluation Section
Resource Conservation and Development Department

Southwest Florida
Water Management District

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Southwest Florida Water Management District
Brooksville, Florida 34604-6899

Proposed Minimum and Guidance Levels for Lake Taylor

State law (Section 373.042, Florida Statutes; hereafter F.S.) directs the Department of Environmental Protection or the water management districts to establish minimum flows and levels for lakes, wetlands, rivers and aquifers. As currently defined by statute, the minimum level of an aquifer or surface water body is "the level of groundwater in the aquifer and the level of surface water at which further withdrawals would be significantly harmful to the water resources of the area". Adoption of a minimum water level does not necessarily protect a water body from significant harm. However, protection, recovery or regulatory compliance can be gauged once a standard has been established.

Minimum flows and levels are to be established based upon the best available information and shall be developed with consideration of "…changes and structural alterations to watersheds, surface waters and aquifers, and the effects such changes or alterations have had, and the constraints such changes or alterations have placed on the hydrology of the affected watershed, surface water, or aquifer…", with the caveat that these considerations shall not allow significant harm caused by withdrawals (Section 373.0421, F.S.). Additional guidance for the establishment of minimum flows and levels is provided in the Florida Water Resources Implementation Rule (Chapter 62-40.473, Florida Administrative Code; hereafter F.A.C.), which requires that "consideration shall be given to the protection of water resources, natural seasonal fluctuations in water flows, and environmental values associated with coastal, estuarine, aquatic and wetland ecology, including: a) recreation in and on the water; b) fish and wildlife habitats and the passage of fish; c) estuarine resources; d) transfer of detrital material; e) maintenance of freshwater storage and supply; f) aesthetic and scenic attributes; g) filtration and absorption of nutrients and other pollutants; h) sediment loads; i) water quality; and j) navigation."

To address this legislative mandate within its jurisdictional boundaries, the Southwest Florida Water Management District (District or SWFWMD) has developed specific methodologies for establishing minimum flows or levels for lakes, wetlands, rivers and aquifers, and adopted them into its Water Level and Rates of Flow Rule (Chapter 40D-8, F.A.C). For lakes, methodologies have been developed for establishing Minimum Levels for systems with fringing cypress-dominated wetlands greater than 0.5 acre in size, and for those without fringing cypress wetlands. Lakes with fringing cypress wetlands where water levels currently rise to an elevation expected to fully maintain the integrity of the wetlands are classified as Category 1 Lakes. Lakes with fringing cypress wetlands that have been structurally altered such that lake water levels do not rise to former levels are classified as Category 2 Lakes. Lakes without fringing cypress wetlands are classified as Category 3 Lakes. Chapter 40D-8, F.A.C. also provides for the establishment of Guidance Levels, which serve as advisory information for the District, lakeshore residents and local governments, or to aid in the management or control of adjustable water level structures.

Typically, two Minimum Levels and three Guidance Levels are established for lakes, and upon adoption by the District Governing Board, are incorporated into Chapter 40D-8, F.A.C. The levels, which are expressed as elevations in feet above the National Geodetic Vertical Datum of 1929 (NGVD), are described below.

- The Ten Year Flood Guidance Level is provided as an advisory guideline for lakeshore development. It is the level of flooding expected on a frequency of not less than the ten-year recurring interval, or on a frequency of not greater than a ten percent probability of occurrence in any given year.

- The High Guidance Level is provided as an advisory guideline for construction of lakeshore development, water dependent structures, and operation of water management structures. The High Guidance Level is the elevation that a lake's water levels are expected to equal or exceed ten percent of the time on a long-term basis.

- The High Minimum Lake Level is the elevation that a lake's water levels are required to equal or exceed ten percent of the time on a long-term basis.

- The Minimum Lake Level is the elevation that a lake's water levels are required to equal or exceed fifty percent of the time on a long-term basis.

- The Low Guidance Level is provided as an advisory guideline for water dependent structures, information for lakeshore residents and operation of water management structures. The Low Guidance Level is the elevation that a lake's water levels are expected to equal or exceed ninety percent of the time on a long-term basis.

In accordance with Chapter 40D-8, F.A.C., proposed Minimum and Guidance Levels were developed for Lake Taylor (Table 1), a Category 2 Lake located in Hillsborough County, Florida. The levels were established using best available information, including field data that were obtained specifically for the purpose of minimum levels development. Data and analyses used for development of the proposed minimum and guidance levels are described in the remainder of this report.

Table 1. Proposed Minimum and Guidance Levels for Lake Taylor.

Minimum and Guidance Levels	Elevation (Feet above NGVD)	Lake Area (Acres)
Ten Year Flood Guidance Level	40.1	NA
High Guidance Level	38.2	53
High Minimum Lake Level	38.2	53
Minimum Lake Level	37.2	51
Low Guidance Level	36.1	48

NA = not available

Data and Analyses Supporting Proposed Minimum and Guidance Levels for Lake Taylor

Lake Setting and Description

Lake Taylor is located in Section 16, Township 27 South, Range 17 East, Hillsborough County, Florida (Figure 1) in the Northwest Hillsborough Basin of the Southwest Florida Water Management District. White (1970) classified the area of west-central Florida containing Lake Taylor as the Northern Gulf Coastal Lowlands physiographic region. Brooks (1981) categorized the area surrounding the lake as the Land-O-Lakes subdivision of the Tampa Plain in the Ocala Uplift Physiographic District, and described the region as an area of numerous lakes on a plain overlying Tampa Limestone. As part of the Florida Department of Environmental Protection's Lake Bioassessment/ Regionalization Initiative, the area has been identified as the Keystone Lakes region, and described as well-drained, sandy upland with numerous slightly acidic, clear-water lakes with low nutrient levels (Griffith *et al.* 1997).

The lake, which lies in the Brooker Creek Watershed, receives inflow from Lake Alice to the east (Figure 2). Outlets along the west shore of the lake provide conveyance to a wetland system that drains to Sunset Lake. There are no surface water withdrawals from the lake currently permitted by the District. There are, however, numerous permitted groundwater withdrawals in the area.

Uplands surrounding Lake Taylor are used primarily for residential development. Native vegetation has been cleared from much of the lake shoreline, although cypress (*Taxodium* sp), and other aquatic and semi-aquatic plants, including pickerelweed (*Pontedaria cordata*), maidencane (*Panicum hemitomon*), torpedograss (*Panicum repens*), spatterdock (*Nuphar luteum*), primrose willow (*Ludwigia* sp.), and cattail (*Typha* sp.) are abundant.

The 1943 and 1974 (photorevised 1987) United States Geological Survey 1:24,000 Odessa quadrangle maps show the lake's surface at 38 ft above the National Geodetic Vertical Datum of 1929 (NGVD). The "Gazetteer of Florida Lakes" (Florida Board of Conservation 1969, Shafer *et al.* 1986) lists the lake area at 44 acres at this elevation. A topographic map of the basin generated in support of minimum levels development (Figure 3) indicates that the lake extends over 52 acres when it is staged at 38 ft above NGVD.

Figure 1. Location of Lake Taylor in Hillsborough County, Florida.

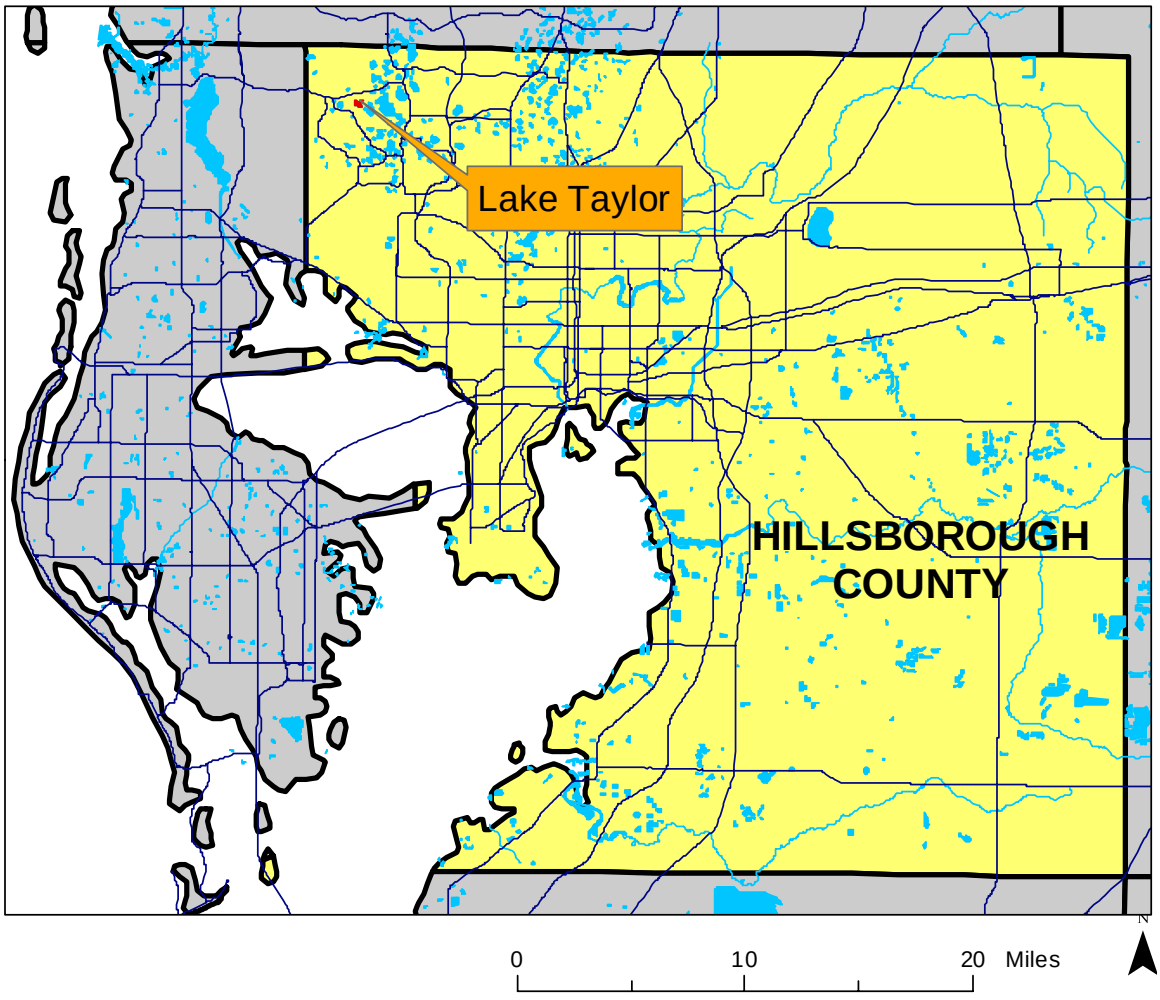
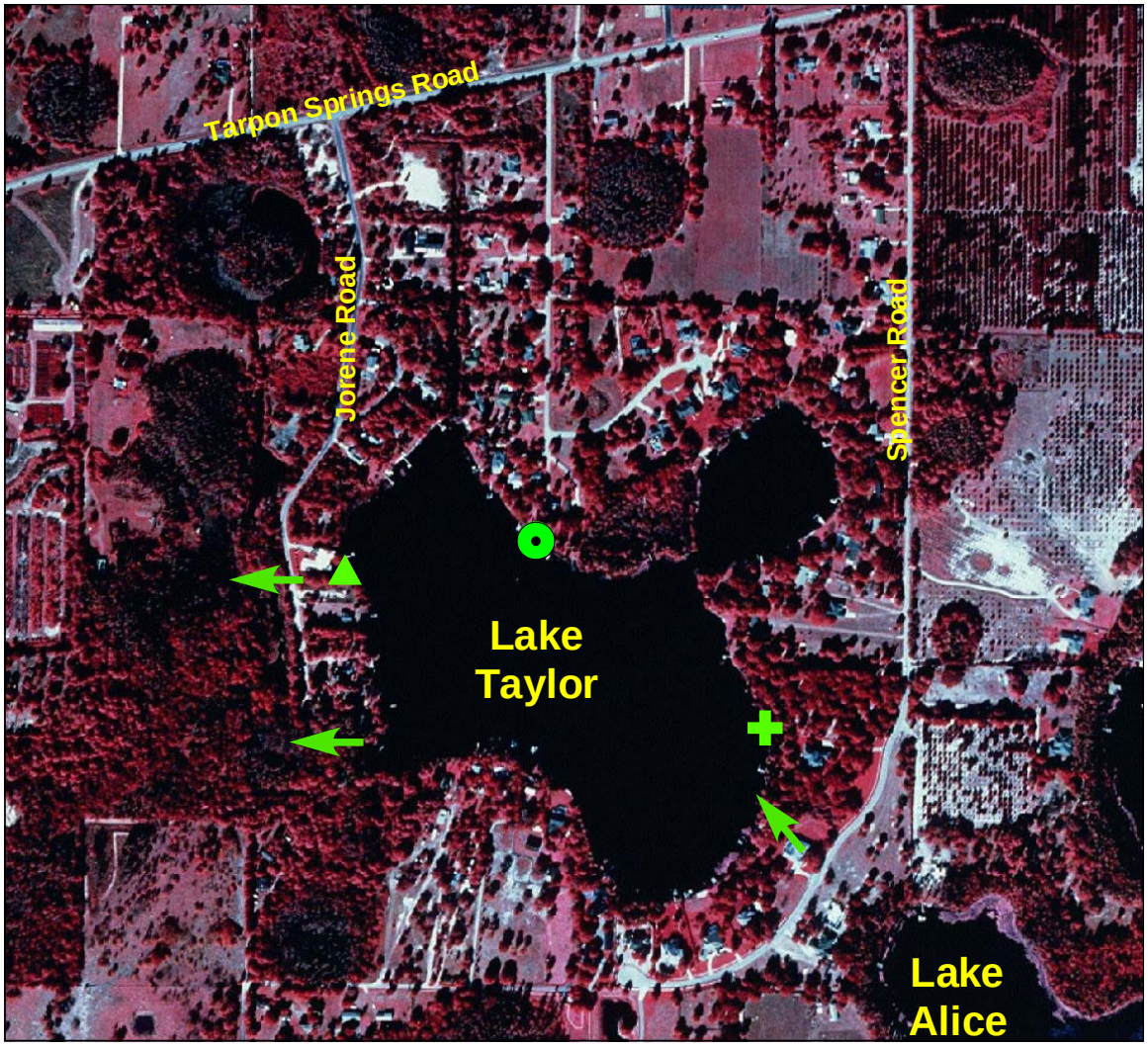


Figure 2. Location of lake water level gauge, inlet, outlets, and sites where hydrologic indicators were measured and the control point elevation was established for Lake Taylor.



Lake Water Level Gauge

Inlet/Outlet

Hydrologic Indicators

Control Point

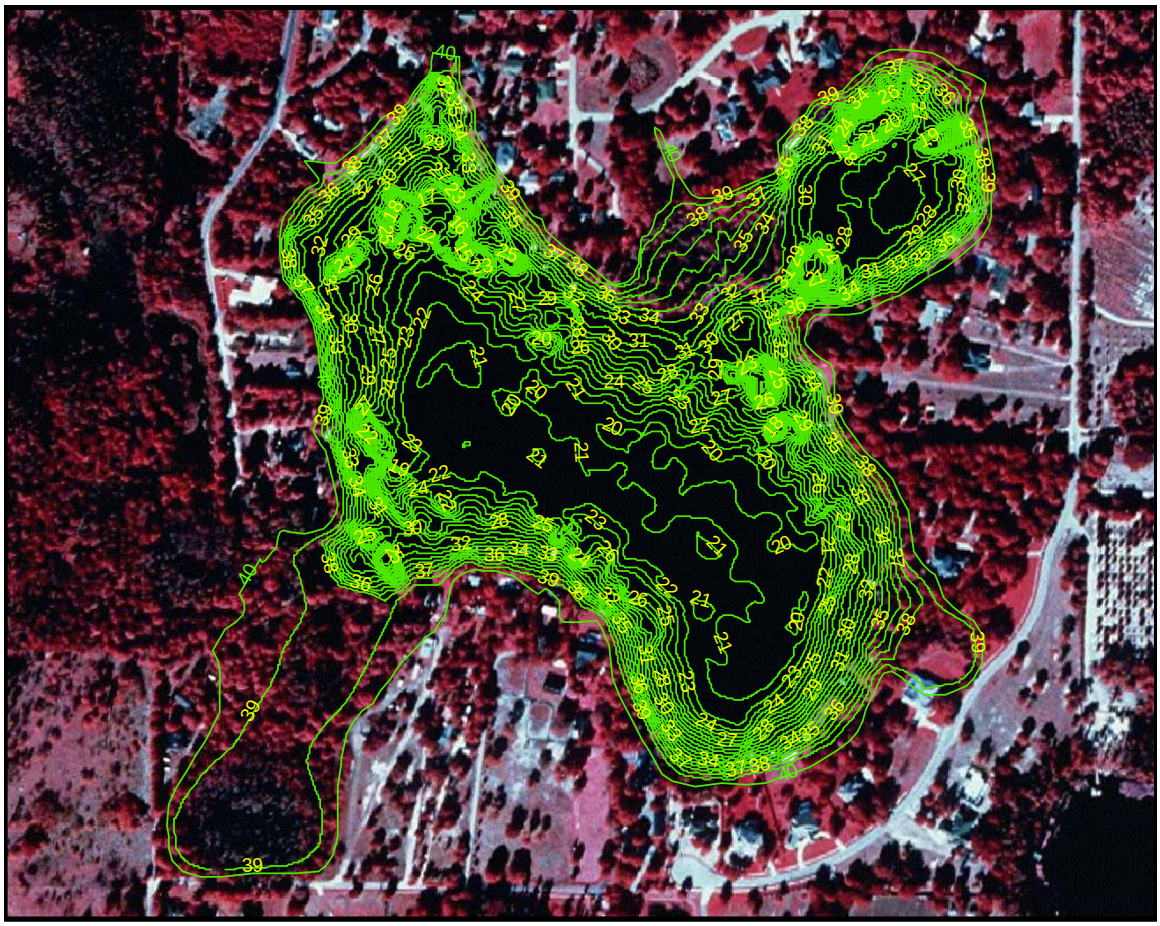
0 250 500 Feet

N

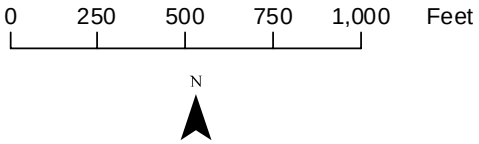
Aerial photography from 1999 USGS Digital Orhtophotograph.

Map prepared May 18, 2004

Figure 3. One foot contours within the Lake Taylor basin. Values shown are elevations, in feet above the National Geodetic Vertical Datum of 1929.



Map prepared May 20, 2004 using 1999 USGS digital orthophotography, one-foot contour data from a 1989 SWFWMD aerial photography map (Sheet No. 16-27-17), and elevation data collected by SWFWMD staff on February 19, 2004.



Currently Adopted Guidance Levels

The Southwest Florida Water Management District has a long history of water resource protection through the establishment of lake management levels. With the development of the Lake Levels Program in the mid-1970s, the District began an initiative for establishing management levels based on hydrologic, biological, physical and cultural aspects of lake ecosystems. By 1996, management levels for nearly 400 lakes had been established.

Based on work conducted in the late 1970s (see SWFWMD 1996), the District adopted management levels (currently referred to as Guidance Levels) for Lake Taylor in September 1980 and incorporated the levels into Chapter 40D-8, F.A.C. (Table 2). A Maximum Desirable Level of 38.75 ft above NGVD was also developed, but was not adopted. The adopted Guidance Levels and the Maximum Desirable Level were developed using a methodology that differs from the current District approach for establishing Minimum and Guidance Levels. The levels do not, therefore, necessarily correspond with levels developed using current methodologies. Upon adoption by the District Governing Board, Minimum and Guidance Levels developed using current methodologies will replace the existing Guidance Levels.

Annually since 1991, a list of stressed lakes has been developed to support the District's consumptive water use permitting program. As described in the District's Consumptive Use of Water Rule (Chapter 40D-2, F.A.C.), "a stressed condition for a lake is defined to be chronic fluctuation below the normal range of lake level fluctuations". For lakes with adopted Guidance Levels, chronic fluctuation below the Low Level is considered a stressed condition. For lakes without adopted levels, the evaluation of stressed condition is conducted on a case-by-case basis. Lake Taylor is included on the current Stressed Lakes List (Gant *et al.* 2004), and for most years since 1992, has been listed as stressed.

Table 2. Adopted Guidance Levels and associated surface areas for Lake Taylor.

Level	Elevation (feet above NGVD)	Lake Area (acres)
Ten Year Flood Guidance Level	39.70	66
High Level	39.25	63
Low Level	36.75	48
Extreme Low Level	34.75	43

Development of Proposed Minimum and Guidance Levels

Proposed Minimum and Guidance Levels were developed for Lake Taylor using the methodology for Category 2 lakes described in Chapter 40D-8, F.A.C. Proposed levels, lake stage percentiles, the normal pool and control point elevations, and significant change standards developed for the lake are listed in Table 3, along with surface areas for each elevation. Detailed descriptions of the development and use of these data are summarized in subsequent sections of this report.

Table 3. Proposed Minimum and Guidance Levels, lake stage percentiles, normal pool, control point elevation, and significant change standards for Lake Taylor.

Levels	Elevation (feet above NGVD)	Lake Area (acres)
Lake Stage Percentiles		
Current P10	38.17	53
Current P50	37.00	50
Current P90	34.88	46
Other Levels		
Normal Pool	39.2	63
Control Point	37.7	52
Guidance Levels and Historic P50		
Ten Year Flood Guidance Level	40.1	NA
High Guidance Level	38.2	53
Historic P50	37.2	51
Low Guidance Level	36.1	48
Significant Change Standards		
Cypress Standard	37.4	51
Recreation/Ski Standard*	39.1	62
Dock-Use Standard*	36.6	49
Aesthetics Standard*	36.1	48
Species Richness Standard*	33.7	43
Basin Connectivity Standard*	33.6	43
Lake Mixing Standard*	NA	NA
Minimum Levels		
High Minimum Lake Level	38.2	53
Minimum Lake Level	37.2	51

NA = not applicable or not available

* = for comparative purposes only; not used for minimum levels development

Lake Stage Data and Percentiles

Lake stage data, *i.e.,* surface water elevations, for Lake Taylor (District Universal ID Number STA 267 267) were obtained from the District's Water Management Data Base in April 2004. The period of record for the data extends from June 1971 through the present date (Figure 4, see Figure 2 for current location of the District water level gauge). The highest surface water elevation for the lake included in the database, 41.00 ft above NGVD, occurred on September 17, 1998. The low of record, 32.25 ft above NGVD, occurred on June 26, 2001. Based on the available lake stage data, monthly mean lake surface elevations were calculated and graphed (Figure 5). The data record for Lake Taylor is not continuous, *i.e.*, there are some months during the period of record when lake surface elevations were not recorded.

For the purpose of minimum levels determination, lake stage data are categorized as "Historic" for periods when there were no measurable impacts due to water withdrawals, and impacts due to structural alterations were similar to existing conditions. In the context of minimum levels development, "structural alterations" means man's physical alteration of the control point, or highest stable point along the outlet conveyance system of a lake, to the degree that water level fluctuations are affected. Lake stage data are categorized as "Current" for periods when there were measurable, stable impacts due to water withdrawals, and impacts due to structural alterations were stable. Historic lake stage data are not available for Lake Taylor because the lake occurs within an area where there are measurable impacts due to groundwater withdrawals (SWFWMD 1999). Lake stage data from January 1964 through the present date are classified as Current data for lakes affected by wellfields within this region.

Current data collected through April 2004 were used to calculate the Current P10, P50, and P90 lake stage percentile elevations. The Current P10 elevation, the elevation the lake water surface equaled or exceeded ten percent of the time during the current period, was 38.17 ft above NGVD. The Current P50 elevation, the elevation the lake water surface equaled or exceeded fifty percent of the time during the current period, was 37.00 ft above NGVD. The Current P90 elevation, the elevation the lake water surface equaled or exceeded 90 percent of the time during the current period, was 34.88 ft above NGVD.

Figure 4. Surface water elevations through April 2004 for Lake Taylor.

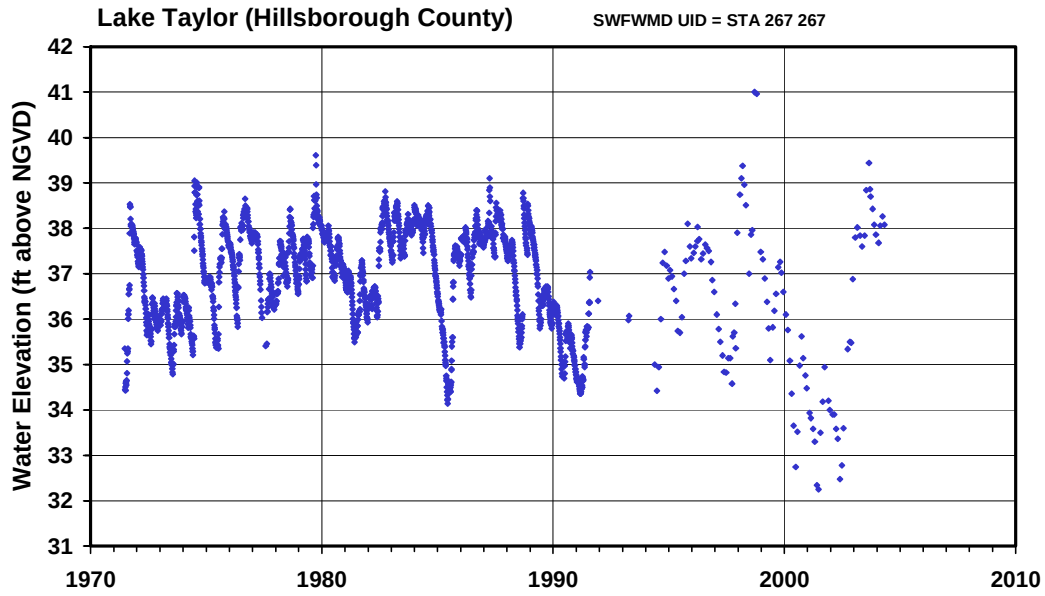
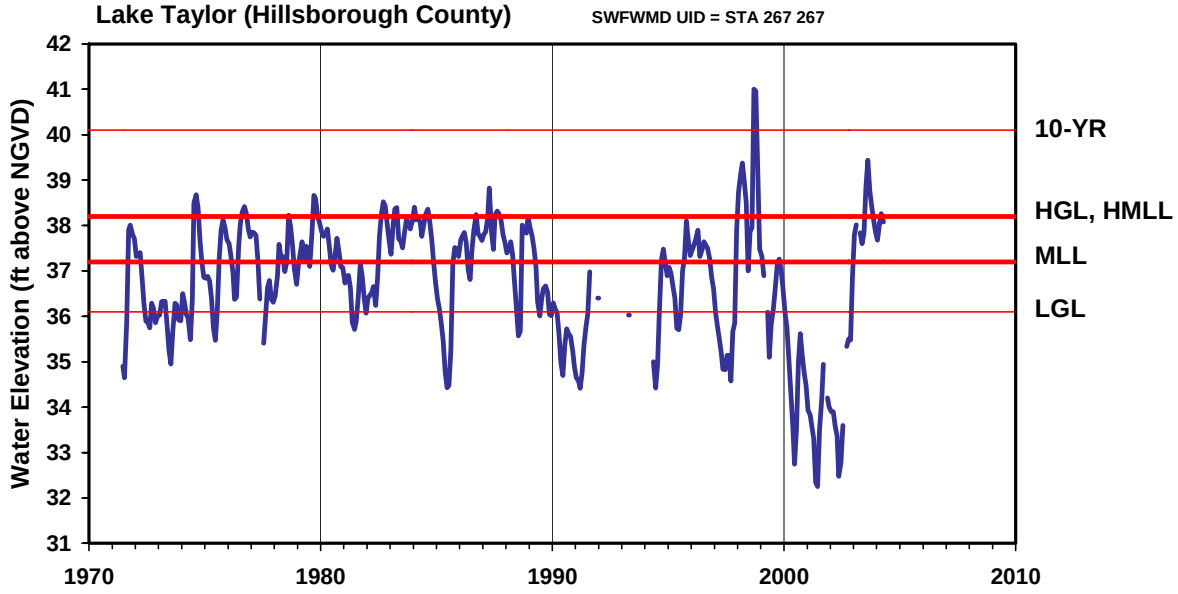


Figure 5. Mean monthly surface water elevations through April 2004, and proposed Guidance and Minimum Levels for Lake Taylor. Proposed levels include the Ten Year Flood Guidance Level (10-YR), High Guidance Level (HGL), Low Guidance Level (LGL), High Minimum Lake Level (HMLL), and Minimum Lake Level (MLL).



Normal Pool and Control Point Elevations

The Normal Pool elevation, a reference elevation used for development of minimum lake and wetland levels, is established based on the elevation of Hydrologic Indicators of sustained inundation, including biological and physical features. Based on the median elevation of buttresses inflection points that were measured in September 2002 for eleven cypress trees along the eastern shoreline of Lake Taylor, the Normal Pool elevation was established at 39.2 ft above NGVD (Figure 2, Tables 3 and 4). The Normal Pool elevation is 1-ft higher than the Current P10 elevation.

The Control Point elevation is the elevation of the highest stable point along the outlet profile of a surface water conveyance system (*e.g.,* weir, ditch, culvert, or pipe) that is the principal control of water level fluctuations in the lake. Based on survey data collected between August 2003 and May 2004, the Control Point elevation for Lake Taylor was established at 37.7 ft above NGVD. The Control Point elevation was established at the top of a board inserted in a concrete weir that is located along the west shore of the lake (Figure 2). Because the Control Point elevation is below the Normal Pool elevation (39.2 ft above NGVD), Lake Taylor is considered to be Structurally Altered.

Table 4. Summary data used for development of the Normal Pool elevation for Lake Taylor.

Normal Pool Statistics	Elevations Based on 11 Cypress Buttresses (feet above NGVD)
Mean (Standard Deviation)	39.2 (0.5)
Median	39.2
Minimum	38.1
Maximum	39.8

Proposed Guidance Levels and the Historic P50

The Ten Year Flood Guidance Level is provided as an advisory guideline for lakeshore development and is the level of flooding expected on a frequency of not less than the ten-year recurring interval, or on a frequency of not greater than a ten percent probability of occurrence in any given year. The proposed Ten Year Flood Guidance Level for Lake Taylor was established at 40.1 ft above NGVD using the methodology for open basin lakes described in current District Rules (Chapter 40D-8, F.A.C.). For the analysis, Hillsborough County's modified version of the Environmental Protection Agency's Stormwater Management Model (SWMM), version 4.31C (Hillsborough County 2000) was used. Model input was based on a ten-year storm event with a 120-hour duration and an 11.3-inch rainfall depth. Based on available lake stage data, the proposed Ten Year Flood Guidance Level was last exceeded in the fall of 1998.

The High Guidance Level is provided as an advisory guideline for construction of lakeshore development, water dependent structures, and operation of water management structures. The High Guidance Level is the expected Historic P10 of the lake. Because Historic data are not available and Lake Taylor is Structurally Altered, the proposed High Guidance Level was established at 38.2 ft above NGVD, the higher of the Current P10 and the Control Point elevations.

The Historic P50 elevation is the elevation that the lake surface is expected to equal or exceed fifty percent of the time on a long-term basis. Because Historic data are not available for Lake Taylor, and the difference between the Current P10 and the Current P50 (1.2 ft) is greater than the Northern Tampa Bay area Reference Lake Water Regime 50 (RLWR50, 1.0 ft, SWFWMD 1999), the Historic P50 was established at 37.2 ft above NGVD by subtracting the Northern Tampa Bay area RLWR50 from the High Guidance Level (38.2 ft above NGVD).

The Low Guidance Level is provided as an advisory guideline for water dependent structures, information for lakeshore residents and operation of water management structures. The Low Guidance Level is the elevation that a lake's water levels are expected to equal or exceed ninety percent of the time on a long-term basis. Because Historic data are not available, and the difference between the Current P10 and the Current P90 (3.3 ft) is greater than the Northern Tampa Bay area Reference Lake Water Regime 90 (RLWR90, 2.1 ft, SWFWMD 1999), the proposed Low Guidance Level was established at 36.1 ft above NGVD by subtracting the Northern Tampa Bay area RLWR90 from the High Guidance Level (38.2 ft above NGVD).

Lake Categorization

For the purpose of Minimum Levels development, lakes are classified as Category 1, 2 or 3 Lakes. Those with fringing cypress wetlands greater than 0.5 acres in size where water levels currently rise to an elevation expected to fully maintain the integrity of the wetlands (*i.e.,* the Historic P50 is equal to or higher than the elevation 1.8 ft below the Normal Pool elevation) are classified as Category 1 Lakes. Lakes with fringing cypress wetlands greater than 0.5 acres in size that have been structurally altered such that the Historic P50 elevation is more than 1.8 ft below the Normal Pool elevation are classified as Category 2 Lakes. Lakes without fringing cypress wetlands or with cypress-dominated wetlands up to 0.5 acres in size are classified as Category 3 Lakes.

Lake Taylor is contiguous with cypress-dominated wetlands greater than 0.5 acres in size (see Figure 2) and is therefore classified as a Category 1 or 2 Lake. Because the Historic P50 elevation (37.2 ft above NGVD) is more than 1.8 ft below the Normal Pool elevation, Lake Taylor was classified as a Category 2 Lake.

Significant Change Standards and Other Information for Consideration

Minimum lake levels are established using basin-specific significant change standards and other available information. The standards are developed to identify thresholds for preventing significant harm to cultural and natural system values associated with lakes, in accordance with guidance provided in the Florida Water Resources Implementation Rule (Chapter 62-40.473, F.A.C.). Other information taken into consideration for minimum levels development includes: substantial changes in the coverage of herbaceous wetland vegetation and aquatic macrophytes; elevations associated with residential dwellings, roads or other structures; frequent submergence of dock platforms; faunal surveys; aerial photographs; typical uses of lakes (*e.g.,* recreation, aesthetics, navigation, irrigation); surrounding land-uses; socio-economic effects; and public health, safety and welfare matters.

For Category 1 or 2 Lakes, a significant change standard is established at the elevation 1.8 ft below the Normal Pool elevation. This standard, operationally referred to as the Cypress Standard, is used to identify a desired median lake stage that may be expected to preserve the ecological integrity of lake-fringing cypress wetlands. Since Lake Taylor is a Category 2 Lake, a Cypress Standard was established for the lake at 37.4 ft above NGVD, based on the Normal Pool elevation of 39.2 ft above NGVD.

For Category 3 Lakes, significant change standards are developed based on: lake water column mixing and susceptibility to sediment re-suspension; water depth associated with docks; basin connectivity; species richness; aesthetics; and recreational values. Other information taken into consideration includes potential changes in the coverage of herbaceous wetland vegetation and aquatic macrophytes. Although Lake Taylor is contiguous with cypress-dominated wetlands, standards used for establishing minimum levels for Category 3 Lakes were developed for comparative purposes.

The Recreation/Ski Standard is developed to identify the lowest elevation within the lake basin that will contain an area suitable for safe water skiing. The standard is based on the lowest elevation (the Ski Elevation) within the basin that can contain a five-foot deep ski corridor delineated as a circular area with a radius of 418 ft, or a rectangular ski area 200 ft in width and 2,000 ft in length, and use of Historic lake stage data or region-specific reference lake water regime statistics. For Lake Taylor, the Recreation/Ski Standard was established at 39.1 ft above NGVD, based on a Ski Elevation of 38 ft above NGVD and the Reference Lake Water Regime 5090 (RLWR 5090) for the northern Tampa Bay area (1.1 ft, Leeper *et al.* 2001).

The Dock-Use Standard is developed to provide for sufficient water depth at the end of existing docks to permit mooring of boats and prevent adverse impacts to bottom-dwelling plants and animals caused by boat operation. The standard is based on the elevation of lake sediments at the end of existing docks, a clearance value for boat mooring, and use of Historic lake stage data or region-specific reference lake water

regime statistics. For Lake Taylor, the Dock-Use Standard was established at 36.6 ft above NGVD, based on the elevation of sediments at the end of 90% of the 38 docks that were observed at the lake in September 2002 (33.5 ft above NGVD, Table 5), a clearance value of 2-ft based on use of powerboats in the lake, and the RLWR 5090 for the northern Tampa Bay area (1.1 ft).

The Aesthetics Standard is developed to protect aesthetic values associated with the inundation of lake basins. The standard is intended to limit potential change in aesthetic values associated with the median lake stage from diminishing beyond the values associated with the lake when it is staged at the Low Guidance Level. The Aesthetic Standard is established at the Low Guidance Level, which for Lake Taylor occurs at an elevation of 36.1 ft above NGVD.

The Species Richness Standard is developed to prevent a decline in the number of bird species that may be expected to occur at or utilize a lake. Based on an empirical relationship between lake surface area and the number of birds expected to occur at a lake, the standard is established at the lowest elevation associated with less than a 15% reduction in lake surface area relative to the lake area at the Historic P50 elevation. For Lake Taylor, the Species Richness Standard was established at 33.7 ft above NGVD.

The Basin Connectivity Standard is developed to protect surface-water connections between lake basins or among sub-basins within lake basins to allow for movement of aquatic biota, such as fish, and support recreational lake-use. The standard is based on the elevation of lake sediments at a critical high-spot between lake basins or lake sub-basins, clearance values for movement of aquatic biota or powerboats and other watercraft, and use of Historic lake stage data or region-specific reference lake water regime statistics. For Lake Taylor, the Basin Connectivity Standard was established at 33.6 ft above NGVD, based on a critical high-spot elevation of 30.5 ft above NGVD located between the main lake basin and the smaller northeastern basin (see Figure 2), a 2-ft clearance value, and the Northern Tampa Bay area RLWR 5090 (1.1 ft).

The Lake Mixing Standard is developed to prevent significant changes in patterns of wind-driven mixing of the lake water column and sediment resuspension. The standard is established at the highest elevation at or below the Historic P50 elevation where the dynamic ratio (see Bachmann *et al.* 2000) shifts from a value of <0.8 to a value >0.8, or from a value >0.8 to a value of <0.8. Because values of the dynamic ratio (which is equivalent to the basin slope) for lake surface elevations up to the Historic P50 elevation are less than 0.8 for Lake Taylor (Figure 6), development of a Lake Mixing Standard was not considered appropriate.

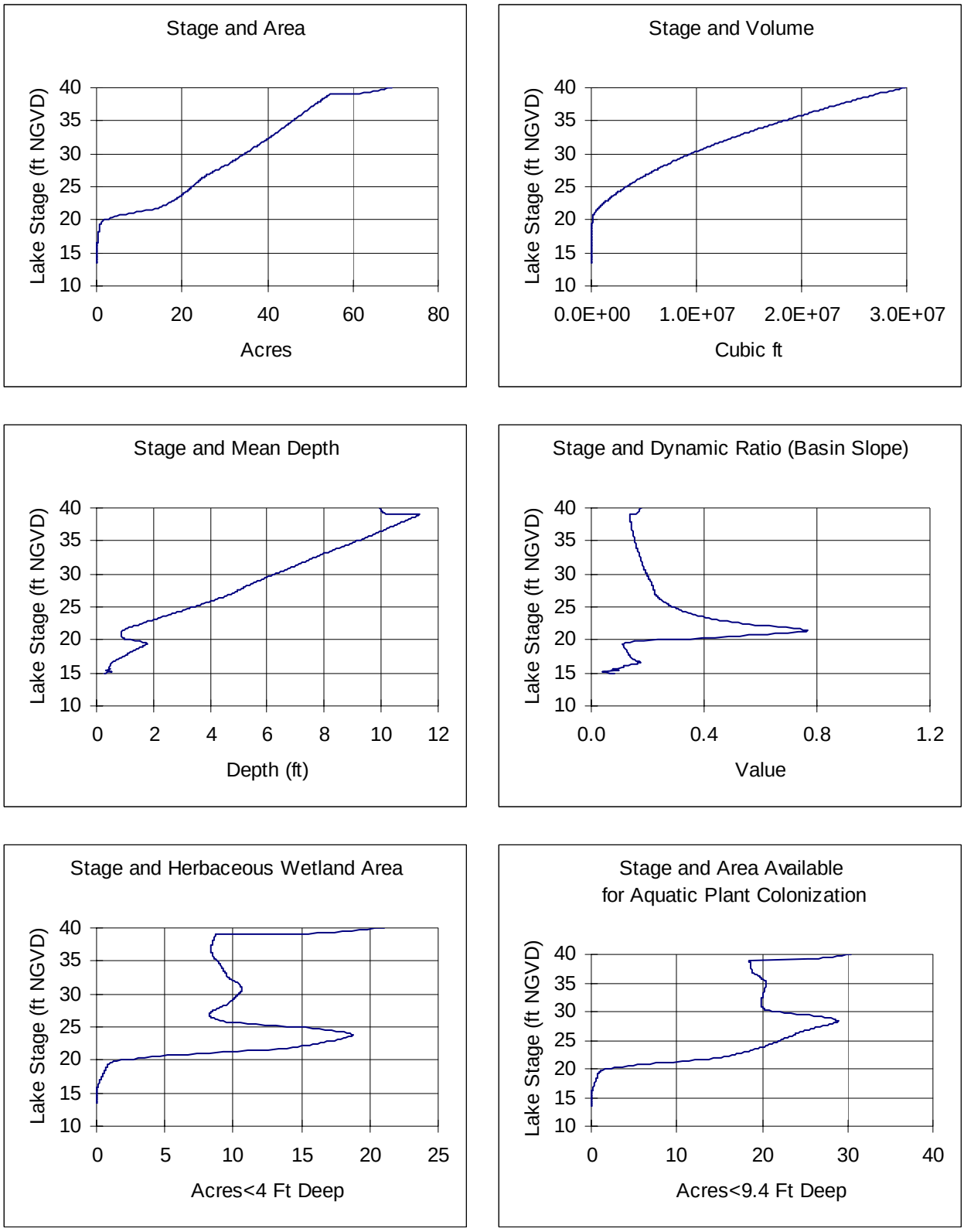
Submersed Aquatic Macrophyte Information is taken into consideration to determine the elevation at which change in lake stage would result in substantial change in the area available for colonization by submersed aquatic plants. Review of the area available for submersed aquatic plant colonization in relation to lake stage did not indicate that use of any of the standards developed for Lake Taylor would be inappropriate for minimum levels development (Figure 6).

Changes in the coverage of herbaceous wetlands (areas colonized by emergent and floating-leaved plants) is taken into consideration to determine the elevation at which change in lake stage could result in substantial change in potential wetland area within the lake basin (*i.e*., basin area with a water depth less than or equal to four feet). Review of changes in potential herbaceous wetland area associated with change in lake stage did not indicate that use of any of the standards developed for Lake Taylor would be inappropriate for minimum levels development (Figure 6).

Table 5. Summary statistics for elevations associated with 38 docks at Lake Taylor. Percentiles (P10, P50, P90) represent elevations exceeded by 10, 50 and 90 percent of the docks.

Statistic	Elevation of Sediments at Dock Ends (feet above NGVD)	Elevation of Dock Platform (feet above NGVD)
Mean (SD)	32.1 (1.9)	39.4 (0.8)
P10	33.5	40.2
P50	32.7	39.6
P90	30.4	38.7
Maximum	33.9	41.0
Minimum	23.2	36.5

Figure 6. Lake Taylor surface area, volume, mean depth, dynamic ratio (basin slope), potential herbaceous wetland area, and area available for colonization by submersed aquatic plants versus lake stage.



Proposed Minimum Levels and Comparison to Long-Term Hydrologic Statistics

Since Lake Taylor is a Category 2 Lake, the proposed Minimum Lake Level was established at the Historic P50 elevation, 37.2 ft above NGVD. The proposed High Minimum Lake Level was established at 38.2 ft above NGVD, an elevation corresponding to the High Guidance Level.

The Minimum Lake Level is the elevation that the lake's water levels are required to equal or exceed fifty percent of the time on a long-term basis. As of April 2004, the water surface elevation at Lake Taylor was above the proposed Minimum Lake Level (Figure 5). However, water levels equaled or exceeded half the time (P50) at the lake for recent long-term (ten-year) periods have been below the proposed Minimum Lake Level (Table 6).

The High Minimum Lake Level is the elevation that a lake's water levels are required to equal or exceed ten percent of the time on a long-term basis. As of April 2004, the water surface elevation at Lake Taylor was 0.1 ft below the proposed High Guidance Level (Figure 5). Water levels equaled or exceed ten percent of the time (P10) for recent long-term (ten-year) periods have also been below the proposed High Minimum Lake Level (Table 7).

Table 6. Comparisons between the proposed Minimum Lake Level (MLL) for Lake Taylor and water surface elevations equaled or exceeded half the time (P50) over the last six 10-year periods.

10-year Period			MLL Equaled or Exceeded ?	Difference (ft) between P50 and MLL
May 1994*	through	December 2003	No	-0.8
April 1993*	through	December 2002	No	-1.2
April 1993*	through	December 2001	No	-1.1
January 1991	through	December 2000	No	-0.7
January 1990	through	December 1999	No	-0.7
January 1989	through	December 1998	No	-0.8

* = Initial date for ten-year period truncated due to lack of water surface elevation data

Table 7. Comparisons between the proposed High Minimum Lake Level (HMLL) for Lake Taylor and water surface elevations equaled or exceeded ten percent of the time (P10) over the last six 10-year periods.

10-year Period			HMLL Equaled or Exceeded ?	Difference (ft) between P10 and HMLL
May 1994*	through	December 2003	No	-0.1
April 1993*	through	December 2002	No	-0.3
April 1992*	through	December 2001	No	-0.3
January 1991	through	December 2000	No	-0.3
January 1990	through	December 1999	No	-0.3
January 1989	through	December 1998	No	-0.3

* = Initial date for ten-year period truncated due to lack of water surface elevation data

Comparison of the High Minimum Lake Level with Lake Basin Features

Elevations of various man-made features within the immediate Lake Taylor basin were determined to evaluate the potential for flooding when the lake surface is at the proposed High Minimum Lake Level. Based on review of available one-foot contour interval aerial maps for the region and field survey data collected between September 2002 and May 2004, the proposed High Minimum Lake Level is 2.5 ft below the centerline of the lowest of the paved roads encircling the lake, 2.3 ft below the slab of the lowest residential dwelling along the lakeshore, 2.2 ft below the floor of a wooden storage shed, and 0.8 ft below a dirt road/driveway adjacent to the southwestern lakeshore (Table 8). The proposed High Minimum Lake Level is, however, higher than the terminal platform of three docks located within the basin. Review of a map of the location of the proposed Minimum Levels within the basin (Figure 7) did not indicate that any residential structures would be inundated when the lake's surface is at the proposed High Minimum Lake Level.

Table 8. Elevations of lake basin features in the immediate Lake Taylor basin.

Lake Basin Features	Elevation (feet above NGVD)
Low Road (Jorene Road)	40.7
Low Floor Slab (house)	40.5
Low Other (wooden storage shed)	40.4
Low Other (dirt road/driveway)	39.0

Figure 7. Approximate location of the proposed Minimum Lake Level (MLL) and High Minimum Lake Level (HMLL) for Lake Taylor. Note that the proposed levels were not mapped in the canal area adjacent to the northwestern lakeshore.

Legend

MLL = 37.2 ft above NGVD

HMLL = 38.2 ft above NGVD

0 250 500 750 1,000 Feet

N

Map prepared May 20, 2004 using 1999 USGS digital orthophotography, one-foot contour data from 1989 SWFWMD aerial photography map (Sheet No. 16-27-17), and elevation data collected by SWFWMD staff on February 19, 2004.

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