

*A Plan for the
Use and Management
of the*

**East Lake
Panasoffkee Property**

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Southwest Florida Water Management District

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EXECUTIVE SUMMARY

Introduction

This document is the product of an ongoing effort by the Southwest Florida Water Management District (District) to prepare a long-range management plan for each District-held property. The District acquires lands throughout its jurisdiction for a variety of water management purposes. Included among these are flood control, water quality enhancement, and the protection or development of potable water supplies. This plan is specific to the East Lake Panasoffkee property, which encompasses the entire eastern shoreline of Lake Panasoffkee and accounts for a total land area of approximately 9,550 acres.

The majority of the property consists of floodplain swamp, with most of the remainder supporting a mixture of freshwater marsh, pine flatwoods, sandhills, oak scrub and mesic hammock forests. The channels of Little Jones Creek, Big Jones Creek and Shady Brook are also located wholly or largely within the property. It has been estimated that these three springfed creeks contribute up to 34 percent of the total annual input of water to Lake Panasoffkee. Protection of the property will contribute directly to the long-term protection and management of the lake, which is recognized as a natural resource of state-wide significance. Although most of the property remains in a relatively natural, unaltered condition, about 1,100 acres were converted to pasture by previous landowners. A more detailed description of the property is provided in the Overview section of the plan.

This plan was developed according to a systematic process which is used to ensure that District lands are managed in an environmentally-acceptable manner, as directed in Chapter 373 of the Florida Statutes. Chapter 373 also directs that altered lands under District ownership must be restored to a natural condition whenever possible, and that District lands must be made available for public uses that are consistent with preservation objectives. The variety of management actions and public uses identified for this property reflect an attempt to balance the preservation objectives mandated by the Florida Statutes with an appropriate level of human use.

Special Protection Areas

Certain areas within the East Lake Panasoffkee property will warrant special protection efforts in order to more effectively preserve water management functions and/or other outstanding natural values. Any areas that are extremely sensitive to disturbance; that harbor unique or regionally-significant natural features; or that play a critical role in the maintenance of the water management values attributed to the property will merit designation as a Special Protection Area. Protective measures in these areas must take precedence over other land use and management considerations. Special Protection Areas identified for the property include the following:

* Bald Eagle Nesting Sites

Guidelines established by the United States Fish and Wildlife Service will be employed to protect the existing eagle nests and to maintain habitat conditions that are conducive to continued nesting on the property.

* Wading Bird Rookeries A historic rookery site will be monitored for nesting activity. Recreational use of Little Jones Creek, including boating, will be managed to prevent disturbance of the rookery.

* Little Jones Creek This creek is noteworthy for its significant contribution of water to Lake Panasoffkee, and for its pristine condition and potential recreational value. Boat access and exotic weeds will be managed in order to maintain the natural values and character of the creek channel, and to ensure the safety of recreational users.

* Archaeological Sites At least 7 sites of undetermined significance have been documented on the property. Public uses will be directed away from these areas and they will be monitored to prevent looting and other disturbance.

Recreational Use

It is the policy of the District that appropriate recreational usage of District-held lands be permitted, provided that the usage is compatible with water management and resource protection needs. Generally, the development and maintenance of recreational facilities must be at the expense of outside entities. Any developed facilities must be open to the public and recreational uses that are not dependent on the natural resource values of the property will not normally be allowed. The District will remain amenable to working cooperatively with Sumter County in the management of public use of the property. Permitted recreational uses of the property will include horseback riding, hiking, camping, canoeing, fishing, birding, picnicking and nature study. An analysis of

the property's ability to support hunting will be conducted to determine if some form of low-intensity hunting may be accommodated. Vehicular access will be permitted on designated roads. Bicycling will be permitted on those roads that are open to vehicular access.

Other Public Uses

A number of other public uses have been considered for the property and may be appropriate if properly conducted. These include environmental education, scientific research and limited cattle grazing. Others include:

* Florida State Agricultural Museum The East Lake Panasoffkee property is being considered as a candidate site for the future development of the Florida State Agricultural Museum. A 200-acre portion of the property, consisting exclusively of improved pasture fronting on State Road 44, has been designated for this potential use.

* Potable Water Supply Wells The City of Wildwood has requested that a 30-acre portion of the property be made available for development of 2 public supply wells. The proposed wells would serve as a back-up source for the City's existing supply. Integration of the proposed wellheads with the facilities of the aforementioned agricultural museum is recommended, to the extent feasible.

Significant Management Actions

The District engages in a variety of land management activities intended to protect or enhance the natural resource values of its properties and to ensure public safety.

Primary management actions planned for the East Lake Panasoffkee property include:

* Prescribed Burning Approximately 1,195 acres of the property support vegetative communities that are dependent upon recurring fire for their long-term maintenance and viability. The property may be especially noteworthy for the on-site occurrence of 660 acres of fire-dependent oak scrub, which is recognized as a globally-imperiled community. The District's fire management program will be tailored to mimic the natural incidence of fire in each of the fire-maintained communities, and to control the spread of smoke to adjoining properties and nearby roads.

* Habitat Restoration Habitat restoration needs for District-held lands are currently being assessed on a District-wide basis in order to prepare a comprehensive, fully integrated restoration plan. During the interim, restoration activities at the East Lake Panasoffkee property will be limited to passive restoration of interior pastures through natural succession. Minor hydrologic restoration may also be conducted in several on-site marshes. The District will also evaluate the feasibility of reestablishing a population of scrub jays in the property's oak scrub habitat.

* Hydrologic Monitoring Withdrawals of groundwater for public supply purposes, and certain private uses, have demonstrated a potential to depress local groundwater levels and thereby degrade nearby natural systems. In response to the City of Wildwood's proposal to develop two public supply wells on the property, and in recognition of the possibility for impacts that may be

attributable to future off-site withdrawals or land uses, the District will implement a program to monitor streamflows and wetland hydroperiods.

* Feral Hog Control Hogs represent a significant land management problem in many natural areas, and their presence in large numbers is incompatible with the District's fundamental management goal of preserving or restoring a natural condition on these lands. The District will implement a trapping program, or other effective strategy, in order to control the hog population.

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INTRODUCTION

The East Lake Panasoffkee property is one of a number of properties owned by the Southwest Florida Water Management District (District). The District acquires lands throughout its jurisdiction for a variety of water management purposes. Included among these are flood control, water conveyance, water quality enhancement, groundwater recharge, and the protection or development of potable water supplies. The criteria that guide the District's land acquisition program, as outlined in Chapters 259.101 and 373.59 of the Florida Statutes, also direct that acquisitions should provide for the preservation and/or restoration of natural systems.

The purpose of this plan is to guide the long-term use and management of the District's East Lake Panasoffkee landholdings. The property accounts for a total land area of approximately 9,550 acres. An additional 88 acres are targeted for acquisition (Southwest Florida Water Management District, 1995). Most of the property remains in a relatively natural, unaltered condition and encompasses the entire eastern shoreline of Lake Panasoffkee. The channels of Little Jones Creek, Big Jones Creek and Shady Brook are located wholly or largely within the property. These natural drainage features contribute nearly all of the surface water inflow to Lake Panasoffkee. About 6,050 acres of the property are blanketed by a second-growth floodplain swamp forest. This amounts to nearly 65 percent of the total land area and nearly all of the lake's 100-year floodplain. The property is also noteworthy for the occurrence of approximately 660 acres of

oak scrub, which has been designated a globally-imperiled plant community by the Florida Natural Areas Inventory on the basis of its rarity and ongoing loss to development.

Lake Panasoffkee is the largest lake in Sumter County and supports a renowned recreational fishing industry. Its significant natural and economic resource values were recognized by the District when it was designated a priority waterbody of the Surface Water Improvement and Management Program (SWIM). A drainage basin estimated to total approximately 60 square miles contributes direct surface runoff to the lake (Taylor, 1977).

Approximately 25 percent of that drainage basin lies within the boundaries of the East Lake Panasoffkee property and will be protected from development and land uses that could degrade the water quality of the lake or alter the natural pattern or quantity of surface inflow. Protection of the property will contribute directly to long-term protection and management of the lake.

The plan begins with a project overview that presents a descriptive summary of the history, water management functions and benefits, land cover and soils of the property. Then, compatible recreational activities and other appropriate land uses are discussed. These are based upon an overall management philosophy which requires that the preservation of water management benefits and natural systems take priority over other uses. Other uses are permitted to the extent that they are compatible with the preservation goals mandated by Florida Statutes. Land management and security concerns are also addressed in a section of the plan entitled "Resource Protection".

Effective management of the property will require extensive, ongoing coordination between the District and a number of outside interests, as well as inter-departmentally within the District. These administrative needs are discussed in the final section of the plan. Coordination with affected local governments, primarily Sumter County and the City of Wildwood, will be of special importance.

The Planning Process

In accordance with District Procedure 61-3, a standard methodology is employed in the development of land use plans for District-owned properties (Christianson, 1988). The first step of this systematic process is to identify Special Protection Areas that occur within the property. These areas may include significant wetland systems; floodplains; flood control facilities; potable water sources; and sensitive ecological features. Restrictions on the use of the property are imposed to ensure the protection of these areas. Next, activity zones are delineated on the basis of accessibility to motorized vehicles. Land use constraints resulting from the size of an area are also considered during this phase of the process. The ultimate objective is to concentrate proposed land uses of similar intensity within appropriate activity zones, thereby preventing incompatible or conflicting uses from occurring within a zone.

Each property is also evaluated to determine its placement within a classification system (Figure 1). The two factors upon which the property classifications are based are the population density of the area surrounding the property, and the extent to which the property has been developed. The extent to

which the property has been “developed” is gauged by examining the character of roads within and around the property. This reflects a recognition of the profound influence that ease of access can exert upon the character of a natural area. The classifications have been devised to provide guidance in the formulation of an overall management philosophy for each property. The management philosophy is an expression of the level of development which should be allowed on the property and the types of uses which are appropriate.

Management Philosophy

The East Lake Panasoffkee property has been designated a remote parkland on the basis of the methodology described above. This designation is reserved for lands that are very rural in character, but which are also clearly influenced by surrounding development or nearby human presence and influence. The perimeter of the property is defined almost entirely by improved roadways and by the Lake Panasoffkee shoreline. These features make the property exceedingly accessible to motorized traffic or vehicles, including boats. Remote parklands present outstanding opportunities for the public to engage in passive, resource-based recreational uses that require a large, natural landscape. The ease of access to the site renders it more approachable or attractive to a larger segment of the population than remote wilderness sites that are less accessible and which tend to cater to individuals seeking greater solitude or a more primitive recreational experience. The future management of the property, and the mix of public uses that will be allowed, should be tailored to match these characteristics.

Figure 1. District Lands Classification System.

LEVEL OF DEVELOPMENT		
POPULATION DENSITY		
Low	Remote Wildlands	Remote Parklands
		< 100,000 people within 10 miles
Moderate	Urban Fringe Wildlands	Urban Fringe Parklands
		100,000 < people within 10 miles < 500,000
High	Urban Wildlands	Urban Parklands
		> 500,000 people within 10 miles
	< 30% Motorized Natural* and > 30% Primitive* and Semi-Primitive Non-Motorized*	< 30% Motorized Natural* or > 70% Motorized Natural* and Semi-Primitive Motorized*
Lands Altered for Water Resource Development		Water Resource Project Lands

* The categories Motorized Natural, Semi-Primitive Motorized, Semi-Primitive Non-Motorized, and Primitive are activity zones defined on the basis of access by motor vehicles

Usage by the public will be permitted to the extent that the natural character and wildlife values of the site may be perpetuated. Any intensive physical or structural improvements will be concentrated around the exterior of the property to the greatest extent possible in order to preserve a quiet, natural core area within the central portions of the property. This approach will maximize the value of the property both for wildlife and recreational users. Limited improvements may be permitted in some interior areas, provided that they are strategically located to avoid impacts to undisturbed areas. Generally, any structural improvements should be located on portions of the property that were altered by human activities conducted prior to the District's acquisition of the land. Overall management will be directed toward perpetuation of a natural, functional ecosystem and the provision of a quality recreational experience by public users.

OVERVIEW

Location

The East Lake Panasoffkee property is located in north-central Sumter County on the eastern edge of the Tsala Apopka Plain. It lies 2 miles west of the City of Wildwood and 12 miles east of Inverness (Figure 2). Although it is currently configured as several disjunct parcels, nearly 9,000 acres of the total land area consists of one continuous tract. The property is bounded generally by the Interstate Highway 75 right-of-way on the east, the County Road 44 right-of-way on the north, and by Lake Panasoffkee on the west and south.

The junction of the Florida Turnpike and Interstate Highway 75, which serves as a major crossroads for out-of-state visitors and is one of the most heavily traveled highway interchanges in the State of Florida, is immediately adjacent to the eastern property line. Future patterns of land usage in the area surrounding the property, as well as demand for public use of the property, may be greatly influenced by its proximity to the interchange. This aspect of the property's location must be carefully considered while planning for its use and management.

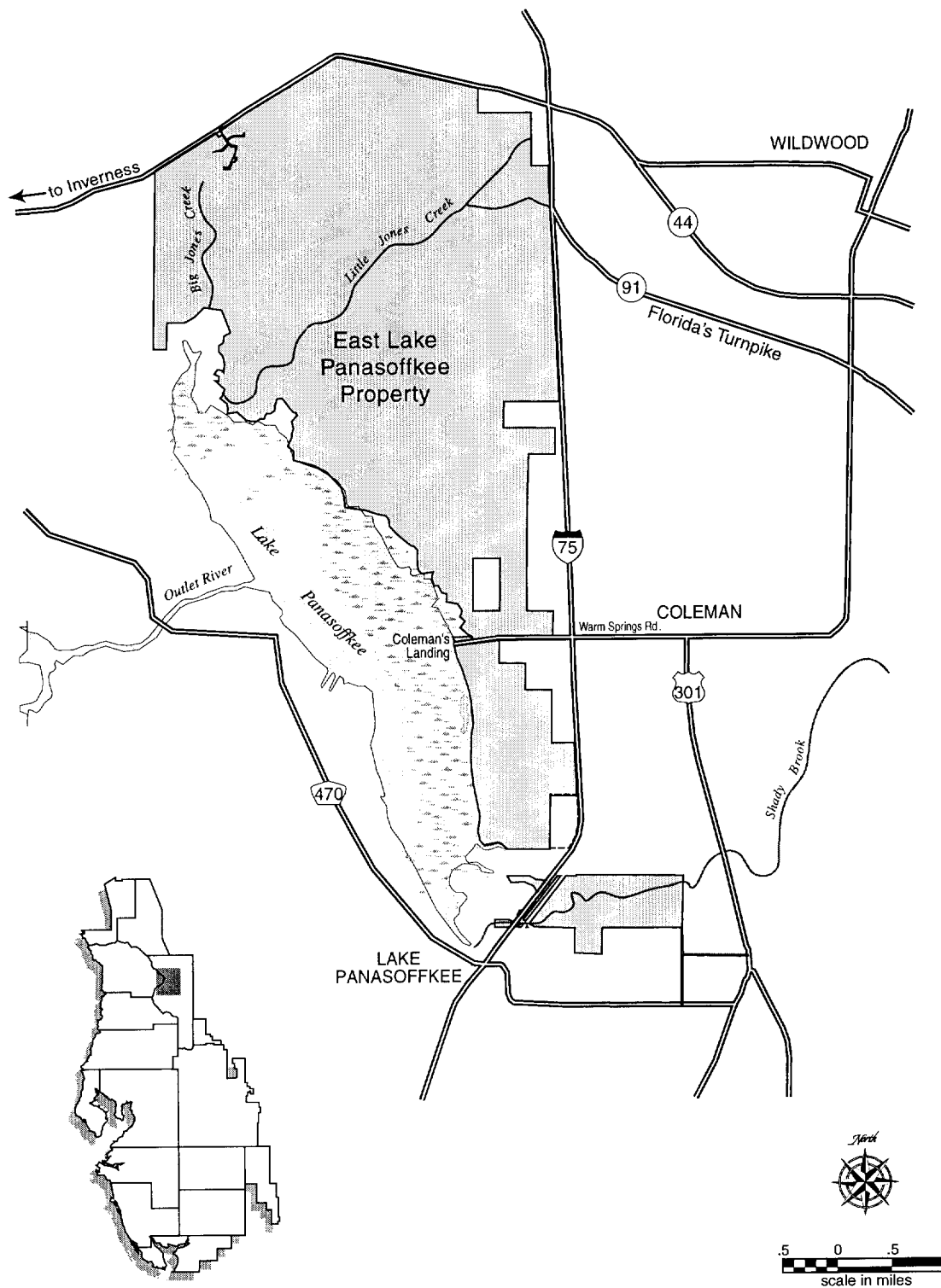
History

The Lake Panasoffkee area, including the East Lake Panasoffkee property, has experienced a long history of agricultural land usage. From the 1830s through the 1880s, the waters of the Withlacoochee River and Lake Panasoffkee provided a convenient transportation network which allowed steamships to travel regularly between the town of Panasoffkee and the

coastal community of Yankeetown (CH2M Hill, 1994). A railroad line linking Panasoffkee with Jacksonville was added in 1883. Easy access to transportation services allowed the local agricultural industry to thrive. Citrus was the primary agricultural product, although severe freezes during the winter of 1894-1895 killed many of the trees and prompted a partial conversion to vegetable crops. The old-growth bald cypress trees on the lake floodplain supported a very active timber industry during the 1880s and 1890s. A large sawmill was constructed near the Panasoffkee railroad depot at the southern end of the lake; however, the timber industry collapsed in 1904 when the last of the cypress had been harvested. The economic vitality of the area also collapsed and the population of Panasoffkee plummeted. The original town of Panasoffkee no longer exists; however, the unincorporated community of Lake Panasoffkee is situated nearby on the southwestern shore of the lake.

The agricultural history of the area has greatly influenced the present day character of the East Lake Panasoffkee property. Citrus cultivation was concentrated on the upland areas east of the lake, and many of the hammocks and other upland islands within the property's floodplain forest were purportedly cleared and planted in citrus during that period (CH2M Hill, 1994). Some of the existing hammocks have regenerated on sites that formerly supported citrus and are not yet mature forests. Much of the existing pasture on the property is also probably a legacy of that period and reflects a progressive transition from the historic citrus and vegetable production to the current predominance of cattle ranching. Remnant cypress stumps in the floodplain swamp are the only

Figure 2. Location Map for the East Lake Panasoffkee Property.



remaining evidence of the old-growth cypress trees that formerly grew there. The canopy of the floodplain swamp probably consisted of a greater proportion of cypress than the existing forest, which consists primarily of hardwoods (Wharton et al., 1977).

Water Management Functions

The District acquires land to achieve a number of different water management benefits, in addition to outright preservation or restoration of natural systems. The following discussion describes the water management benefits associated with the East Lake Panasoffkee property and describes any land management objectives or strategies that will be critical to maintaining or preserving those benefits.

Natural Flood Control

Wetland areas and floodplains have a natural ability to store or detain water generated by storm events. A recognition of this innate characteristic of wetlands was one of the factors that motivated contemporary efforts to preserve wetlands, which had long been viewed as useless wastelands to be filled or drained. Approximately 7,600 acres of the property, or over 75 percent of the total land area, support wetland communities. The majority of the wetland area is floodplain swamp (6,250 acres), which has the ability to store considerable volumes of stormwater deposited within the Lake Panasoffkee watershed. The other on-site wetland communities consist of either isolated marshes and wet prairies, or a fringe of willow and other emergent marsh vegetation associated with the Lake Panasoffkee shoreline. Although the isolated systems are similar to the

floodplain swamp in their ability to store stormwater, their contribution to ameliorating flooding in off-site areas is probably very minimal. As wetlands that are continuous with the open waters of Lake Panasoffkee, the willow fringe and much of the freshwater marsh also lack the ability to ameliorate off-site flooding. Preserving the property's flood protection values will be dependent upon maintaining the storage capacity of the floodplain swamp. Any future development on the property will be designed to avoid filling and will be consistent with District regulations that control stormwater discharges and impacts to wetlands. In addition, alterations that would accelerate or impede natural surface flows through the swamp, including road improvements or construction of recreational amenities, will be avoided.

Potable Water Supply

The City of Wildwood (City) has requested that the District make a small portion of the East Lake Panasoffkee property (approximately 30 acres) available for development of a pair of public supply wells. Water produced by the proposed wells would be reserved for residents of the City and the surrounding area. Interconnection of the wells with the City's existing complex of public supply wells would provide a necessary back-up system. It would also allow for the rotation of pumping among the various well sites to provide for periodic "resting" of wells and recovery of surrounding groundwater levels.

The initial request from the City indicated that the on-site well system would be limited to two 12-inch production wells. Each well would have a projected production capacity of approximately 2,000

gallons per minute and a daily production capability of approximately 3 million gallons per day (mgd). One of the wells would serve only as a back-up system. The District and City have agreed that no additional public supply wells will be proposed for this property, and that the total withdrawal rate from the property will never exceed 3 mgd.

Initial guidance from the District directed that the proposed production wells should be sited on the northern end of the property, which has largely been converted to improved pasture, to prevent disturbance to natural areas. Such deployment would also maximize the distance between the wellheads and the property's surface water features, which may be sensitive to large-scale groundwater withdrawals, and would reduce the expense and impact of pipelines and other infrastructure associated with the wells.

The District's lands are routinely made available for development of public water supply sources when site-specific conditions are appropriate for such development. Hydrogeologic conditions at the East Lake Panasoffkee property are not extremely conducive to the development of a large-scale water production system based on analyses previously conducted or reviewed by the District (SWFWMD, 1990). Additional analyses, which will be required as part of the District's review of the proposal, will be conducted to ensure that the relatively small withdrawal quantities proposed by the City can be supported on this property. The property lies within the eastern limits of the Tsala Apopka Plain, which is an area where the top of the Floridan aquifer occurs very near the land surface. Limestone of the aquifer frequently

outcrops and can be seen along sections of the Lake Panasoffkee shoreline. The absence of a thick layer of deposits overlying the aquifer, and lack of a well-defined confining unit, render the aquifer extremely susceptible to contamination.

Previous investigations have determined that the potentiometric surface of the Floridan aquifer in the local area is higher than the surface of Lake Panasoffkee during much of the year. This factor, combined with the absence of a confining layer and thick surficial deposits as noted above, results in conditions that promote the upward movement or discharge of water from the Floridan aquifer. An annual water budget based on data collected during the 1991-1992 period has been prepared for Lake Panasoffkee and estimates that approximately 39 percent of the total annual input of water is derived from groundwater discharge beneath the surface of the lake (CH2M Hill, Inc., 1994). In contrast, direct precipitation accounts for only 16 percent of the water budget. Discharge from Little Jones Creek, Big Jones Creek, and Shady Brook are estimated to account for 34 percent of the total annual input of water and nearly all of the surface input. Although some of the surface flow discharged to the lake through these systems has its origin as surface runoff draining from the floodplain swamp, the majority of the flow is derived from springs which serve as the headwater origins of Little Jones Creek and Shady Brook. As such, most of the surface drainage to the lake also originates as groundwater discharged from the Floridan aquifer and groundwater contributions to the lake may actually account for nearly 70 percent of the total water budget.

Large-scale withdrawals of groundwater to satisfy public supply needs have demonstrated a clear potential to affect above-ground natural systems. Localized declines in aquifer levels and the potentiometric surface, in response to large withdrawals of groundwater, can sever or short-circuit natural sources of groundwater input to above-ground systems and result in declining surface water levels or shortened wetland hydroperiods. Springs that are close enough to the site of the withdrawals to lie within the local cone of depression can also experience chronic reductions in the normal rate of discharge. An analysis of simulated drawdown effects in the Lake Panasoffkee area (Camp and Barcelo, 1988) suggests that the Fenny Springs origin of Shady Brook may be highly susceptible to such impacts. The simulation was based on a pumping scenario that consisted of simultaneous production from a number of different locations within Sumter County, including a site that corresponds generally with the East Lake Panasoffkee property. The simulated withdrawal rate for this location (28 mgd) far exceeded that which would take place from the proposed wells (maximum of 3 mgd), thereby making a direct comparison difficult; however, the study clearly alludes to the potential for withdrawal-related impacts to springflow. In addition, the study did not consider springflow impacts to Little Jones Creek or Big Jones Creek, which lie in closer proximity to the proposed wells than Fenny Springs and may therefore be equally sensitive to local groundwater withdrawals.

The clear dependence of Lake Panasoffkee on groundwater sources lends additional emphasis to the need for careful consideration of the property's water supply potential. Lake Panasoffkee is the

largest lake in Sumter County and is recognized as a recreational and environmental resource of regional significance. Its regional significance is reflected by its designation as a ranked priority waterbody of the District's Surface Water Improvement and Management Program. In addition, the natural values of the East Lake Panasoffkee property would be greatly reduced by adverse impacts to the on-site wetlands and creeks in response to a decline in groundwater levels and ensuing changes in wetland hydroperiods and rates of spring discharge and streamflow.

The District administers rules which regulate the use of water. These regulations, promulgated as Chapter 40D-2 of the Florida Administrative Code, address the potential for adverse environmental impacts as a result of large-scale withdrawals of water. An essential element in preventing excessive impacts from the proposed wells will be related to the collection of data on aquifer levels, wetland water levels, hydroperiods, streamflow and spring discharge prior to initiating public supply withdrawals from the wells. Such data will establish the baseline or pre-development condition so that resulting variations from historic conditions can be identified and addressed. The District will consider initiating a program of data collection on the East Lake Panasoffkee property that can provide a long-term account of baseline conditions and be used to deduce future changes to the system, including any that might be associated with future development of the proposed on-site water supply wells. If the City of Wildwood eventually applies to the District for a water use permit that would allow development of the proposed wells, then the District's Resource Projects Department

and Planning Department will work closely with Water Use Permitting staff to ensure that data collection and monitoring requirements are properly coordinated to meet the District's land management and protection goals.

The proximity of the northern end of the property to a large, intensely active highway interchange complex may also prove to be problematic for the future placement of public supply wells at this site. Wellhead protection regulations require appropriate setbacks, generally of at least 500 feet, from land uses that may represent possible sources of groundwater contamination. The concentration of truck and automobile service centers at the interchange, and extensive areas of impermeable surfaces and associated stormwater treatment basins, may affect the future placement or configuration of wellheads in the immediate area.

Water Quality Enhancement

Wetland vegetation has a natural ability to filter suspended sediments from the water column and to assimilate certain waterborne pollutants. These characteristics of wetlands permit them to enhance the quality of degraded or polluted waters that drain to them or through them. Forested wetland systems, such as the floodplain swamp which covers much of the property, are especially effective at enhancing water quality in this manner. Preservation of the floodplain swamp will maintain its inherent ability to enhance water quality and will also preclude any future development on a majority of the Lake Panasoffkee floodplain, thereby reducing the potential for future land uses that could degrade water quality conditions in the lake. In addition, the aquatic vegetation of the property's

freshwater marsh and willow communities which border the eastern edge of the lake is of critical importance in maintaining or improving current water quality conditions in the lake (CH2M Hill, 1994; SWFWMD, 1995). Maintenance of the aquatic macrophytic vegetation that fringes the eastern shoreline of the lake, and accounts for the westernmost extent of the property, will be considered a management priority. See the section of this plan devoted to wetland land cover for additional discussion.

The water quality benefits associated with preservation of the East Lake Panasoffkee property will do much to further the goals of the Surface Water Improvement and Management (SWIM) Plan that has been prepared for Lake Panasoffkee. As noted in a preceding section of this plan, the lake has been designated a ranked priority waterbody of the District's SWIM Program. The maintenance or improvement of water quality in Lake Panasoffkee is a major emphasis of the SWIM Plan.

Uncapped remnant wells on the property represent another management concern associated with water quality. However, this concern is unrelated to the property's water quality enhancement values and is addressed in the Resource Protection component of this plan.

Land Cover

Wetlands

FLOODPLAIN SWAMP

The predominant land cover on the East Lake Panasoffkee property is floodplain swamp. This native plant community accounts for approximately 6,050 acres, or

nearly 65 percent of the total area of the property (Figure 3). Areas indicated as floodplain swamp on the land cover map are actually an ill-defined mixture of true floodplain swamp interspersed within a matrix of hydric hammock and bottomland forest. These communities share an affinity for sites that are regularly flooded or saturated and may be distinguished primarily by differences in hydroperiod. Floodplain swamp is associated with the flooded stream channels and with depressions in the floodplain and tends to be inundated for most of the year. At East Lake Panasoffkee, these forests are restricted to areas along the well-defined drainages of Little Jones Creek, Big Jones Creek and Shady Brook. Several minor drainages, and the near-shore areas along the southwestern boundary on Lake Panasoffkee, also support floodplain swamp. The canopy in such areas is dominated by buttressed, hydrophytic trees such as bald cypress (*Taxodium distichum*) and blackgum (*Nyssa biflora*) which can tolerate the frequent inundation to which these sites are subjected. Pop ash (*Fraxinus caroliniana*) and red maple (*Acer rubrum*) are also prevalent. The understory and groundcover are typically very sparse, but at East Lake Panasoffkee include occasional dahoon holly (*Ilex cassine*), swamp fern (*Blechnum serrulatum*) and royal fern (*Osmunda regalis*).

A highly diverse contingent of resident and transient wildlife contrasts sharply with the low diversity of the plant life found in these forests. Many species of reptiles and amphibians, including salamanders, frogs and snakes, reside in floodplain swamps. Locally, these include such species as the American alligator (*Alligator mississippiensis*) and river cooter (*Pseudemys concinna suwanniensis*), which have been designated as Species of Special Concern by the Florida

Game and Fresh Water Fish Commission (FGFWFC). The latter species is typically restricted to spring-fed rivers but it is common in Lake Panasoffkee, hypothetically due to the spring-fed nature of the lake (Simons, 1990) and its surface tributaries. The river otter (*Lutra canadensis*), which is not listed as a protected species but appears to be declining in numbers worldwide, is also presumed to occur in this portion of the property.

A large number of bird species are also dependent upon such floodplain swamps, including the wood duck (*Aix sponsa*), swallow-tailed kite (*Elanoides forficatus*), barred owl (*Strix varia*), pileated woodpecker (*Dryocopus pileatus*), red-shouldered hawk (*Buteo lineatus*), and many species of migratory warblers. As noted in the discussion of Special Protection Areas established for this property, a downstream section of the Little Jones Creek floodplain swamp has historically served as a colonial bird nesting site for the great blue heron (*Ardea herodias*) and wood stork (*Mycteria americana*), the latter of which has been designated an endangered species by both the U.S. Fish and Wildlife Service and the FGFWFC. Mammals such as the raccoon (*Procyon lotor*), bobcat (*Lynx rufus*) and threatened Florida black bear (*Ursus americana floridana*) are also native to floodplain swamp habitats; however, it is unlikely that the size, location, and overall mix of natural communities would allow the property to serve as primary habitat for the black bear.

Hydroperiods in hydric hammock forests tend to be much shorter than those of floodplain swamps. Although the soils may be saturated on a year-round basis, inundation occurs infrequently and generally does not exceed a cumulative total

EAST LAKE PANASOFFKEE SOR PROJECT



- Urban and Built-up
- Pasture
- Oak Scrub
- Mesic Hammock
- Floodplain Swamp
- Cypress Swamp
- Willow
- Freshwater Marsh
- Water
- Pine Flatwoods
- Sandhill
- Scrubby Flatwoods
- Pine Plantation
- Transportation, Communication and Utilities
- Industrial and Mining
- Project Boundary



Scale 1:40,000



Land use and cover data were photointerpreted from 1:24,000 and 1:40,000 color infrared aerial photographs taken between November of 1989 and March of 1991.
Data were edited and updated by SWFWMD Planning Department, June 1995.

Figure 3. Vegetation Map for East Lake Panasoffkee Property

of 60 days per year (Florida Natural Areas Inventory and Florida Department of Natural Resources, 1990). Inundation is usually associated with heavy rainfall and is of short duration. These forests usually occur in low, flat areas where limestone lies just below the soil surface and frequently outcrops. Canopy diversity is much higher than in floodplain swamps and consists of a predominance of hardwood species. Hydric hammocks on the property are dominated by water oak (*Quercus nigra*), laurel oak (*Quercus laurifolia*), sweetgum (*Liquidambar styraciflua*), sweetbay (*Magnolia virginiana*), southern magnolia (*Magnolia grandiflora*), red maple (*Acer rubrum*), red cedar (*Juniperus silicicola*), cabbage palm (*Sabal palmetto*) and American hornbeam (*Carpinus caroliniana*). Saturated soil conditions result in a sparse understory and groundcover that is dominated by palms and ferns.

Bottomland forests are difficult to distinguish from hydric hammocks solely on the basis of species composition; however, bottomland forest is only very-rarely flooded and depends upon a shallow depth to groundwater to provide adequate water for support of the dense, lush vegetation. The rarity of flooding usually permits development of a more continuous and diverse groundcover and understory.

There is considerable overlap in the mix of wildlife species that occur in floodplain swamp, hydric hammock and bottomland forest. Most of the species listed as native to floodplain swamp also occur in hydric hammock and bottomland forest. However, differences in hydroperiod, microclimate and groundcover composition result in increased overall habitat diversity and a corresponding increase in wildlife diversity. Species such as white-tailed deer (*Odocoileus*

virginianus), turkey (*Meleagris gallopavo*) and gray fox (*Urocyon cinereoargenteus*) do not utilize floodplain swamp to a great extent owing to the long hydroperiod, but all depend greatly upon the hydric hammock and bottomland forest. This “within community” diversity imparts a high habitat value to the forested wetland portion of the property.

The on-site complex of forested wetland is very sensitive to hydroperiod and minor changes in hydroperiod could promote extreme changes in community composition. A small, long-term decline in the water table would create dryer conditions in the hydric hammock and bottomland forest and promote succession toward mesic hammock. The natural hydrologic regime of these forests must be maintained if their natural values and functions are to be preserved. The proposal to develop a pair of public supply wells at the northern end of the property, which was discussed in a preceding section of this plan, will be thoroughly evaluated through the District’s water use permitting program to prevent adverse hydrologic impacts to the floodplain swamp system.

OTHER WETLAND COMMUNITIES

Other wetland communities on the property include an estimated 380 acres of freshwater marsh and 470 acres of willow or “shrub” marsh. These communities account for about 4 percent and 5 percent, respectively, of the total land area. Although they are much less extensive in total coverage than the floodplain swamp complex discussed above, they serve as habitat for a very different complement of wildlife and contribute substantially to the overall habitat diversity and wildlife value of the property.

Freshwater marshes are shallow depressions that are subject to regular and extended inundation and which support a preponderance of herbaceous vegetation. The property's marshes are dominated by maidencane (*Panicum hemitomon*) in the shallow-water areas and by pickerelweed (*Pontedaria cordata*), arrowheads (*Sagittaria spp.*), cattails (*Typha spp.*) and water lilies (*Nymphaea spp.*) in deeper-water zones. Wax myrtle (*Myrica cerifera*) or young slash pines (*Pinus elliottii*) have invaded the margins of some marshes and may reflect a need for prescribed fire. Fire plays an essential role in maintaining marsh communities by preventing the invasion of woody shrubs and trees. Most of the isolated freshwater marsh systems are fringed by a narrow band of wet prairie, which for the sake of brevity has been lumped into the freshwater marsh category. Wet prairies may often be distinguished by the presence of St. John's wort (*Hypericum spp.*).

The willow marsh occurs as a broad fringe along the southeastern shoreline of Lake Panasoffkee and as an extensive stand at the confluence of Little Jones Creek and Big Jones Creek near the northern tip of the lake. These areas support an almost continuous expanse of carolina willow (*Salix caroliniana*), with occasional red maples, and represent a ecotone between the lake and the floodplain swamp (Southwest Florida Water Management District, 1990). In some areas, red maple has attained dominance over the willow. This may signal a transformation in the community in which willow, which has served as a transitional or "pioneer" species, may be replaced by red maple in a successional process leading to expansion of the floodplain swamp.

Like the floodplain swamp, the above wetland systems are dependent upon a natural hydrologic regime that includes seasonal fluctuations in water levels and duration of flooding. Natural fluctuations and climatic cycles, which may include periods of either drought or exceptionally wet years, can be tolerated readily by the vegetation and wildlife; however, long-term alterations in the natural regime can produce fundamental changes in the community. Most of the on-site freshwater marshes, including the three largest individual marsh systems, occur at the northern end of the property and would be in closer proximity to the proposed wells than most of the floodplain swamp. Their proximity to the site of the withdrawals could render these marshes more susceptible to impacts associated with declining groundwater levels than other on-site wetlands. Protection of the nearby freshwater marshes will be considered a high priority during review of the water use permit application submitted to the District for establishment of the two public supply wells. Permitting requirements associated with the District's water use permitting program will ensure that withdrawal-related impacts are avoided or minimized. In contrast, the willow marsh may be relatively immune to such effects. These areas are more distant from the proposed well site and are continuous with the open waters of Lake Panasoffkee, which may buffer that community from the potential impacts of local groundwater withdrawals.

Some of the marshes in the northwestern corner of the property have been subjected to minor alterations through the excavation of shallow swales which drain water from the systems during periods of high water.

Discussion of restoring these systems by plugging or backfilling the swales is deferred to the section of this plan devoted to habitat restoration.

The marsh communities discussed above support a large number of invertebrate species and are essential areas for the reproduction of many amphibians. The gopher frog (*Rana capito*), which is recognized as a Species of Special Concern by the FGFWFC (FGFWFC, 1994), is one such species and its occurrence on the property is expected. Although the adult gopher frog inhabits the upland burrows of the gopher tortoise (*Gopherus polyphemus*), the amphibious life history of the species dictates a dependence upon aquatic systems for breeding purposes. Preservation of the property's isolated marshes will be critical to the on-site perpetuation of such species. Other wetland-dependent amphibian species that have actually been documented on the property include the pig frog (*Rana grylio*), bullfrog (*Rana catesbeiana*) and green treefrog (*Hyla cinerea*).

Wading birds are especially dependent upon freshwater marshes for foraging, and the property's marshes may be particularly important habitat for birds that nest on or near the property. The occurrence of an on-site rookery, discussed in the section of the plan devoted to Special Protection Areas, may be closely linked to the presence of these marshes. At least one of the property's marshes is also suspected to serve as nesting habitat for the sandhill crane (*Grus canadensis*). The Florida subspecies of the crane has been designated a threatened species by the FGFWFC (FGFWFC, 1994).

Uplands

MESIC HAMMOCK

Mesic hammock, which accounts for approximately 950 acres in total land area and 10 percent of the property, is the dominant upland community. These forests occupy the property's mid-level elevations, situated between the lower-lying wetlands and the more xeric upland communities discussed below. The mesic conditions found in these forests support a dense, closed canopy dominated by live oak (*Quercus virginiana*), laurel oak, southern magnolia and pignut hickory (*Carya glabra*). Low light levels penetrating the canopy, coupled with heavy leaf litter, result in a sparse understory and groundcover. In spite of the relatively low diversity of plant life in these areas, they are valuable to wildlife and contribute significantly to the heterogeneity of the property.

Mesic hammocks are widely considered to be the ultimate "climax" community in Florida (FNAI and FDNR, 1990). Such communities are resistant to fire and tend to be very stable. Protection of the property's mesic hammock will depend upon carefully controlling permitted public use to prevent excessive disturbance. Several blocks of mesic hammock occur as "islands" within the floodplain swamp and may serve as especially important areas of refuge for wildlife. The network of trail roads that provide access through the property, and which will double as a recreational trail network, necessarily pass through these areas which served as the only dry land within the surrounding matrix of floodplain swamp. However, the establishment of campsites and other fixed or structural recreational amenities will be avoided in these "island" hammocks.

PINE FLATWOODS

Pine flatwoods, which constitute the most extensive upland community in the State of Florida, account for only about 120 acres (1 percent of total) of the Panasoffkee property. They occur in scattered patches and support an open canopy that consists of slash pine (*Pinus elliottii*) or longleaf pine (*Pinus palustris*). Loblolly pine (*Pinus taeda*) and pond pine (*Pinus serotina*) also occur in some of the property's flatwoods. An understory is usually absent, but there is typically a dense groundcover of herbs and shrubs. Dominant shrubs include saw palmetto (*Serenoa repens*), gallberry (*Ilex glabra*) and fetterbush (*Lyonia lucida*). A wide variety of wildlife utilize flatwoods communities. These include white-tailed deer, gray fox (*Urocyon cinereoargenteus*), bobcat (*Lynx rufus*) and raccoon (*Procyon lotor*).

Like many of the plant communities native to Florida, pine flatwoods are pyric communities that are adapted to recurring growing season fires. In the long-term absence of fire, the habitat value of flatwoods may decline and the vegetational composition of the community may change. Prescribed fire will play important role in the management of the property's pine flatwoods. Refer to the Resource Protection section of this plan for additional discussion of the fire management needs of the property.

XERIC UPLANDS

The balance of the natural lands account for approximately 695 acres of total land area and consist of 660 acres of oak scrub (7 percent of total) and 35 acres of sandhill (less than 1 percent of total). Although scrub and sandhill communities are

strikingly different in terms of species composition and gross physical appearance, they share a close affinity in terms of characteristic soils and dependence upon fire. Both communities are restricted to sites with well-drained sandy soils and, like the flatwoods community discussed above, they are adapted to recurring fire. Xeric conditions are typical of the sites that support these communities and are clearly reflected by the assemblage of plant and animal species that are native to such sites. Early speculation that soil differences may account for the differential occurrence of scrub and sandhill have been discounted and it has been suggested instead that fire history is the primary determinant of which community will occur on a particular site (Myers, 1985). Sites that have historically been subjected to frequent fires are more likely to support sandhill vegetation; conversely, sites that burn infrequently are more likely to support scrub.

Sandhill communities support an open canopy of longleaf pine, an understory of turkey oak (*Quercus laevis*), and a variable groundcover of grasses and herbs. Scattered saw palmetto may also be present in the understory. Wiregrass (*Aristida stricta*) is normally the dominant groundcover and plays an important role in fueling the frequent, low intensity fires that are characteristic of sandhills; however, wiregrass is nearly absent from the East Lake Panasoffkee sandhills. This is probably a result of past land use practices, including cattle grazing.

Scrub communities can be distinguished as either sand pine scrub or oak scrub, based on the presence or absence of an overstory of sand pine (*Pinus clausa*). Although sand pine occurs on the property, it is fairly infrequent and oak scrub predominates.

The understory, which is more definitive of the scrub community, is composed of shrubby evergreen oaks that include sand live oak (*Quercus geminata*), myrtle oak (*Quercus myrtifolia*) and Chapman oak (*Quercus chapmanii*). All three species are present in the East Lake Panasoffkee scrub. Tarflower (*Befaria racemosa*), pawpaw (*Asimina reticulata*) and saw palmetto are also present.

Sandhill and scrub provide habitat for a large variety of species, including some that depend exclusively upon such areas. The well-drained sands of these areas are especially attractive to the gopher tortoise (*Gopherus polyphemus*) which resides in burrows that provide essential habitat for a host of “burrow commensals”, including the threatened gopher frog (*Rana areolata*). The gopher tortoise has been designated a species of special concern, due in part to the importance of its burrows to other species. Although the gopher frog has not been documented on the property, its occurrence is likely given the local, on-site presence of the seasonal wetlands necessary for completion of its amphibious life cycle. Other species that may use or reside in these xeric habitats include the threatened Eastern indigo snake (*Drymarchon corais couperi*) and the diamondback rattlesnake (*Crotalus adamanteus*). The Florida scrub jay (*Aphelocoma coerulescens coerulescens*), which has been designated a threatened species by both the FGFWFC and the USFWS, is endemic to Florida scrub. It has not been observed on the property but it probably occurred there historically. A proposal to reintroduce scrub jays to the property is discussed in the Resource Protection section of this plan.

The great extent of scrub vegetation represented here is one of the property’s most noteworthy characteristics. Much of Florida’s original scrub vegetation has been lost because the high, dry nature of scrub areas makes them highly coveted for development. The Florida Natural Areas Inventory has identified scrub as a globally-imperiled natural community on the basis of its rarity and rapid, continuing destruction. Public ownership of the East Lake Panasoffkee property will ensure the preservation of a significant expanse of this threatened community. Refer to the section of this plan devoted to habitat restoration for additional discussion of the property’s oak scrub vegetation.

Disturbed Lands

The remainder of the property consists of lands that have been altered by human action to such an extent that they cannot presently be assigned to any natural community. These disturbed lands account for about 1100 acres (12 percent of total) and are composed almost entirely of improved pastureland. The northern pastures have been the most intensively improved and maintained and support a continuous carpet of bahia grass (*Paspalum notatum*). Soil composition and elevation suggests that these pastures supported sandhill vegetation prior to alteration. Occasional occurrences of purple milkweed and pawpaw within the pasture support this conclusion, and any habitat restoration planned for these areas should be designed with sandhill vegetation as the target community.

Pastures in the interior and southern reaches of the property have not been as intensively maintained and in most cases have been invaded by dog fennel

(*Eupatorium capillifolium*) and other pioneer, old field vegetation. Soils and elevations in these pastures indicate that these areas supported a preponderance of pine flatwoods vegetation prior to alteration. The less-improved character of these pastures, relative to the northern pastures, combined with generally more mesic conditions and a more interior location, may render these pastures more appropriate for timely restoration efforts than those in the northern end of the property. The degree of improvement and relatively xeric conditions may make restoration more difficult in the north. In addition, the peripheral location of the northern pastures and contiguity with the Highway 44 right-of-way may detract from the post-restoration habitat value of these areas. As described in the habitat restoration section of this plan, passive restoration of the interior pastures will be promoted until a comprehensive restoration plan has been completed.

There are a number of structures scattered within the disturbed lands of the property. Some of these structures are projected to be suitable for recreational or land management applications. These are discussed in a subsequent section of the plan. Structures that are not projected to serve such functions in the future should be dismantled or otherwise removed from the property.

Soils

The composition and spacial arrangement of the vegetative communities discussed above are a direct reflection of the assortment and arrangement of native soils on the property. The predominance of wetland vegetation conforms with a predominance of hydric soils that are

characteristic of wetland systems. Gator muck, Terra Ceia muck and Nittaw muck, listed in order of decreasing dominance, underlie the prominent expanse of floodplain swamp (Soil Conservation Service, 1988). These soils are very poorly drained, high in organic content, and typical of sites that are subjected to frequent flooding. The high content of organic matter and the regularity of flooding renders these soils unsuitable for development and place severe limitations upon potential recreational uses.

Everglades muck, like the other muck soils discussed above, is reflective of sites that are very poorly drained and prone to frequent flooding. However, the vegetation usually associated with this category of soils is freshwater marsh that borders the edge of lake or river floodplains. These soils underlie the broad band of willows, shrubs and sawgrass that separate the floodplain swamp from the open water of Lake Panasoffkee.

The remaining wetland areas of the property are the non-forested marshes and wet prairies, which are distinguished by Basinger, Placid, and Vero fine sands. These poorly drained sands are restricted to depressional areas that are ponded for at least 6 to 8 months per year. One notable marsh in the interior of the property is denoted as an isolated occurrence of Okeelanta muck, which is also a soil of depressional areas. Hydroperiods for Okeelanta muck are estimated to range between 6 and 12 months per year. The majority of this marsh has been uprooted by hogs, except for isolated patches of sand cordgrass (*Spartina bakeri*). This is the only marsh in the project area where cordgrass has been observed.

The mesic soils of the hammocks and flatwoods include Immokalee, Myakka, Smyrna and Oldsmar fine sands. These sands are poorly drained and typically occur in areas of high water table. The property's sandhill vegetation is underlain by either Candler sand or Tavares fine sand. Rapid permeability and a greater depth to the water table distinguish these soils, which range from well-drained to excessively-drained. Based on review of soil maps prepared by the Soil Conservation Service (now known as the Natural Resources Conservation Service), the property's oak scrub zones are highly variable in terms of soil composition and sometimes include soils normally associated with flatwoods and hammocks. The best developed stands of scrub are restricted to relatively xeric sites with highly permeable soils, including Tavares and Pomello fine sands. High permeability in the sandhill and oak scrub sites equates with soils of sandy texture and low compaction. Intensive forms of recreational use and high levels of vehicular use cannot be readily supported on these soils, which generally coincide with the areas of highest elevation, i.e. at elevations of 50 feet NGVD or greater. Recreational and vehicular usage of these areas will be directed to existing roads and trails, to the greatest extent possible, in order to prevent excessive erosion and destruction of vegetation in undisturbed areas.

Adjacent Land Use

Sumter County is very rural in character, and land use patterns on the lands surrounding the East Lake Panasoffkee property are consistent with that rural character. Agricultural uses, especially ranching, are predominant. However, the network of major highways in the

immediate vicinity of the property make it conducive to increased levels of land development. Residential development associated with the surrounding area's high level of accessibility is concentrated in the areas of the City of Wildwood, Coleman, and the unincorporated community of Lake Panasoffkee (Figure 2). The vegetation map of the property (Figure 3) depicts land cover and land use information for the community of Lake Panasoffkee on the southwestern shoreline of the lake and clearly distinguishes the natural character of the East Lake Panasoffkee property from the agricultural and developed character of surrounding lands.

Mining for limerock and sand occurs at several sites in close proximity to the property, and it is this use that may pose the greatest threat to the long-term integrity of the property's natural systems. Mining activities frequently require the pumping of large quantities of water which can result in localized declines in groundwater levels. Extreme declines could affect water levels in some of the property's wetlands or result in reduced springflow or streamflow in the on-site creeks. The District will work closely with Sumter County to ensure that future mining, and other nearby land uses, will not adversely affect the property's natural systems.

THE CONCEPTUAL LAND USE PLAN

Special Protection Areas

Certain areas within the East Lake Panasoffkee property will warrant special protection efforts in order to more effectively preserve water management functions and/or other outstanding natural values. Any areas that are extremely sensitive to disturbance; that harbor unique or regionally significant natural features; or that play a critical role in maintenance of the water management values attributed to the property will merit designation as a Special Protection Area. Typically, Special Protection Areas must be discrete features that can be readily defined. Protective measures in these areas will take precedence over other land use and management considerations.

Special Protection Areas designated for the East Lake Panasoffkee property include: protection zones around two bald eagle nesting sites; a site that has historically served as a wading bird rookery; the on-site channel of Little Jones Creek; and all known archaeological sites located on the property. Additional Special Protection Areas may be designated in the future on the basis of colonization or regular use by an imperiled species, or in recognition of other significant resource values and concerns. Potential designations for this property include: potable water supply wells, which may be constructed in response to a proposal submitted by the City of Wildwood; and oak scrub habitat occupied by the Florida scrub jay (*Aphelocoma coerulescens*). Although none of the property's oak scrub is currently inhabited

by scrub jays, a restoration concept proposed in this plan suggests an investigation of the feasibility of establishing a population on the property.

Bald Eagle Nesting Sites

Florida supports the largest population of the Southern bald eagle (*Haliaeetus leucocephalus*) remaining in the conterminous United States. Populations of the Southern bald eagle, a recognized subspecies that originally ranged over much of the United States, have rebounded considerably since the species was originally designated an endangered species by the United States Fish and Wildlife Service (USFWS). Nesting pairs now inhabit sites scattered across the nation; however, Florida's population remains the core or nucleus of the national population.

The bald eagle is clearly in the early stages of a successful recovery, and the USFWS recently reclassified or "downlisted" the species to threatened status. On the basis of its relatively secure status in Florida, the Florida Game and Fresh Water Fish Commission (FGFWFC) has also designated it as threatened rather than endangered. It is estimated that Florida presently supports over 600 nesting pairs of eagles (Linda Finger, USFWS, pers. comm.). The secure status of the species in Florida lends additional significance to the Florida population. Many of the nesting pairs that have been established in other states can trace their origin to eggs and captive-bred individuals of Florida descent.

Riparian areas along the coast or in close proximity to large inland lakes are the preferred habitat of the bald eagle. Two nests occur on the East Lake Panasoffkee property, presumably owing to the rich

foraging area provided by nearby Lake Panasoffkee. Both nests are located in large pine trees growing near the margins of oak scrub vegetation. Neither nest occurs in a conspicuous location, nor in an area projected to experience high public use pressure. Aerial monitoring conducted by the FGFWFC determined that one of the nests was active during the 1994-1995 nesting season and apparently fledged one juvenile eagle (John White, FGFWFC, pers. comm.). The second nest, which is newly-documented and was monitored for the first time by FGFWFC in the 1994-1995 season, was determined to be inactive; however, it did not appear to be a new nest. Observations by the District's land management staff indicate that the nest was active during the 1993-1994 nesting season. It will continue to be monitored by the FGFWFC. Habitat management guidelines established by the USFWS suggest that inactive nests should continue to be monitored and protected and should not be considered abandoned nests until experiencing at least five consecutive years of inactivity (United States Fish and Wildlife Service, 1987).

Individual eagles can differ greatly in terms of their sensitivity to human presence and disturbance. However, disturbance around a nesting site can often induce abandonment of the nest and prevent successful breeding. Eagles that nest in extremely isolated sites may be particularly sensitive to human presence, in contrast to those that choose to nest in more populated areas and may have developed a certain tolerance for human presence. The USFWS has published guidelines regarding activities that should be avoided around eagle nests (United States Fish and Wildlife Service, 1987). These guidelines suggest that a primary zone radiating up to 1,500

feet from a nest tree should be protected from physical disturbance or alteration, especially during the nesting season. A secondary zone, which extends outward from the primary zone an additional 1,500 feet and is subject to less stringent restrictions, is also suggested in the guidelines. When combined, the primary and secondary zones around a nest encompass an area of over 160 acres and extend a distance in excess of 0.5 miles from the site of the nest tree. Although public use of these areas will not be precluded entirely, appropriate limitations on human activity will be imposed on the basis of the USFWS guidelines. The isolated, inconspicuous locations of the existing nests make it unlikely that protection of the eagle nests will significantly limit human access or recreational use of the property.

All current and future bald eagle nesting sites shall be afforded Special Protection Area status. Protective measures prescribed for these areas will be based on the exclusion zones recommended in the USFWS guidelines. However, restrictions on the usage of areas within the exclusion zones may in some cases exceed those recommended by the USFWS. Proper management and protection of these areas will help to ensure that those natural qualities which make the sites attractive to eagles will be preserved and thereby promote the establishment of new nests. Public usage that would require structural improvements or other physical site alterations will not be permitted in an area equivalent to the secondary zone. Only the most passive recreational activities, such as hiking and nature study, will be permitted in the secondary zone. On the basis of

site-by-site determinations, primitive campsites and other minor, unobtrusive recreational amenities may be permitted within the peripheral reaches of a secondary zone if the configuration of the area, an existing or historic pattern of local usage, or other factors strongly suggest that the activity would result in no additional disturbance of the nest site.

Public usage of lands within a primary zone will be discouraged by avoiding any placement of recreational features within those areas. The use of pre-existing trails for hiking may be permitted if the character of the area suggests that it would not disturb the nest site. The establishment of new hiking trails will be prohibited within the primary zone. All restrictions on the usage of lands within exclusion zones will apply equally to any portions of an exclusion zone that extend onto the property from nests located off-site. Other management measures designed to foster continued use of the property by bald eagles will be initiated as appropriate.

Wading Bird Rookeries

At least one wading bird rookery site has been documented on the property (Nesbitt et al., 1982). Data from the 1977 nesting season indicated that wood storks and great blue herons (*Ardea herodias*) nested at the site. The documented presence of wood storks is particularly significant given the endangered status of the species. Subsequent monitoring of the rookery has occurred infrequently and indicates that the site was inactive during the 1978, 1989 and 1995 nesting seasons. The site is located near the downstream end of Little Jones Creek and regular recreational use of the

area may have affected use by the birds, although the very intermittent nature of monitoring at the site may have overlooked recent nesting activity. An extensive body of research has documented the sensitivity of wading bird rookeries to human disturbance and presence (Rodgers and Smith, 1995; Tremblay and Ellison, 1979; Buckley and Buckley, 1976; Jenni, 1969), and access to active rookeries located on public lands is typically restricted to protect the birds and prevent abandonment of those sites. For example, the Little Gator Creek Wildlife and Environmental Area, which is managed by the Florida Game and Fresh Water Fish Commission and is located approximately 25 miles south of the East Lake Panasoffkee property, is closed to recreational use whenever an on-site wood stork rookery is active.

Populations of most wading bird species have declined greatly in recent decades. A considerable amount of biological research has focused on identifying the reasons for the declines. Many of these studies have attempted to identify the suite of site conditions that are required for establishment of successful wading bird rookeries. The research has confirmed that rookeries are very susceptible to man-induced disturbance (Tremblay and Ellison, 1979; Buckley and Buckley, 1976). In recognition of the sensitivity of rookery sites, and of the imperiled status of the wood stork and several of the other species of wading birds known to frequent the property, the rookery site will be treated as a Special Protection Area. Any future rookery sites or roosting areas will also be afforded Special Protection Area status.

Protection of the rookery site, and any rookeries established in the future, will require that recreational uses and other potentially-disruptive land uses be appropriately controlled or directed to other areas of the property (Tremblay and Ellison, 1979). The birds are typically more sensitive to disturbance during the courtship, nest-building and early-nesting stages of the nesting season. This includes the time period extending generally from February through July for most species, and extra precautions may be required during this period to avoid inducing possible abandonment of nests. The birds are often reluctant to abandon eggs or young, and thus may be somewhat more tolerant of minor disturbance in later parts of the nesting season. Prescribed fires and other land management activities conducted in the vicinity of an occupied rookery should be restricted whenever possible during this normal period of activity. Recent research suggests that an exclusion zone extending at least 100 meters from a rookery site should be established during nesting periods (Rodgers and Smith, 1995). Any human activity and presence should be prohibited within the exclusion zone. Airboats are especially disruptive and an exclusion zone of at least 200 meters has been recommended for such watercraft (Jim Rodgers, pers. comm.). Subsequent sections of this plan direct that use of Little Jones Creek by motorized boats will be restricted in some fashion, which may improve conditions for nesting by wading birds and promote reestablishment or expansion of the rookery. The actual creation and enforcement of exclusion zones will take place only when nesting activity occurs at the site.

Although the FGFWFC has historically monitored Florida's wading bird rookery sites, monitoring efforts have been severely curtailed. Funding and staffing constraints dictate that only the largest and most significant rookeries can continue to be monitored on an annual basis (Nancy Joiner, FGFWFC, pers. comm.). The remainder will be monitored at five-year intervals. As such, District staff will monitor the historic rookery site on an annual basis for signs of renewed activity. In the event that the site becomes active, any necessary special management actions will be implemented immediately. This includes the possibility of temporary or seasonal closure of the downstream segment of Little Jones Creek to recreational use. Management of the rookery site will also be consistent with guidelines prepared by the USFWS to promote recovery of the wood stork (USFWS, 1986).

Little Jones Creek

As noted in a preceding section of this plan, approximately 34 percent of the total water budget for Lake Panasoffkee is derived from surface water flows draining to the lake via the creeks of the East Lake Panasoffkee property, i.e. Little Jones Creek, Big Jones Creek, and Shady Brook (CH2M Hill, 1994). Monthly inflow measurements conducted from May, 1992, through April, 1993, indicate that the majority of this surface water inflow to the lake (over 66 percent of total) consists of discharge from Little Jones Creek. Little Jones Creek is a pristine, undisturbed river channel. Nearly the entire 5-mile length of the channel is protected within the property. Only the springfed, headwater origins of the river extend beyond the boundary of the property. It is the longest and most scenic of the on-site creeks.

The Little Jones Creek river channel is designated a Special Protection Area on the basis of its significant contribution to the overall water budget of Lake Panasoffkee, and in recognition of its pristine condition and potential recreational value. Maintaining the natural qualities of the river corridor will be considered an important management priority. The growth of non-native aquatic weeds, including especially water hyacinth (*Eichornia crassipes*), water lettuce (*Pistia stratiotes*) and hydrilla (*Hydrilla verticillata*), will be controlled as necessary in the river channel. Recreational usage will be carefully managed and the District will implement a monitoring program to track long-term discharge rates and water quality conditions. The District will also actively work to prevent land uses, both on and off-site, that may be expected to result in unacceptable impacts to stream flow or water quality. The limited data currently available indicate that the spring discharge which constitutes the baseflow of the creek may be experiencing elevated levels of nitrate (CH2M Hill, 1994). Elevated nitrate levels in discharge from other springs in the region have been linked to surrounding land use patterns (SWFWMD, 1994).

The District will explore various opportunities for protecting the primary spring origin of Little Jones Creek. Fee simple acquisition of the site, which has been developed as a single family residence, would provide protection to the entire main branch of the river and would also greatly expand its recreational potential. An analysis of the benefits of acquiring a fee or less-than-fee interest in the site will be performed.

Archaeological Sites

The Florida Master Site File, which is maintained by the Division of Historical Resources of the Florida Department of State (FDOS), has recorded the presence of at least 7 archaeological sites on the East Lake Panasoffkee property (Marion Smith, FDOS, pers. comm.). Additional consultation with the Bureau of Archaeological Research is warranted to determine the significance of these sites and to outline site-specific protection strategies. All archaeological sites on the property will be considered Special Protection Areas. Any future structures or recreational improvements, including foot trails, will be directed away from known archaeological sites whenever possible. Management priorities for these sites will focus primarily on the prevention of looting by amateur archaeologists. Security personnel assigned to the property will be apprised of the locations of sites and will be instructed to monitor the areas for signs of looting.

Although the District does not generally provide funding to support archaeological investigations and assessments, the property's sites will be made available for supervised study by professional archaeological researchers. Proposals to conduct such research will be reviewed by the District on a case-by-case basis and must satisfy any requirements or protocols dictated by the Division of Historical Resources of the FDOS.

Activity Zones

The delineation of activity zones, on the basis of the criteria outlined in Figure 4, is an important step in guiding future land uses on District-held properties. The designations assist in identifying

appropriate areas for the siting or clustering of compatible land uses, thereby avoiding conflicts among uses and ensuring that the natural resource values of the property are preserved to the utmost. It is a procedure that was developed by the United States Forest Service and it has been adapted by the District to serve as a guiding principle for evaluating and siting various land uses. The activity zone process provides a blueprint for the future of the property and for the superstructure upon which management and land use decisions will be based.

The criteria for delineating activity zones reflect the influence that accessibility can have on the overall character of a natural area. The relative ease with which a site can be approached or entered will, more than any other single factor, determine the degree to which the site has been, or will be, altered or influenced by human presence. It will also determine the range of recreational uses that can readily be accommodated at a site without engaging in physical improvements that would change existing levels of accessibility.

The current activity zone map for East Lake Panasoffkee (Figure 5) indicates that the property encompasses three different classes or categories of activity zones. This mixture and configuration of activity zones is essentially an expression of the manner in which motorized access will be permitted. The management philosophy adopted for this property, as previously discussed on page 3 of this plan, advocates a management approach that would restrict structural improvements to the periphery of the property. Intrusion and alteration in the interior will remain limited to the minimum necessary to accommodate passive recreational uses or achieve habitat

restoration and management objectives. As such, motorized access and the most intensive uses will be restricted to the northern end of the property.

The portions of the property that will be open to motorized access, or that will lie within the influence of motorized access, have been designated as either motorized natural zones or semi-primitive motorized zones (Figure 5). Motorized natural zones occur as corridors along the edges of Class I roads or "motor routes" (see Figure 6 for a description of roadway classifications). The semi-primitive motorized zones are associated with Class II roads and waterways. These two categories of activity zones are distinguished by the relative extent to which motorized access will be permitted in those areas. Class I roads are projected to be opened to essentially unrestricted vehicular access by the public. Opening of these roads will probably be limited to daylight hours and would not be permitted until adequate control over access can be attained through strategic installation of fencing and gates at appropriate locations. Class II roads will be opened to vehicular access on a limited or seasonal basis and would be restricted to special uses associated primarily with an environmental education program. Additional discussion of these issues is provided in subsequent sections of the plan devoted to access and public use.

The Lake Panasoffkee shoreline is treated as a Class II "road" or motor route because it provides an avenue by which the property can be approached by motorized vehicles, i.e. boats. The marshy character of most of the shoreline will place constraints on such access and will probably limit actual entry to airboats or shallow draft vessels. The difficulty of approaching the shoreline due

Figure 4. Criteria for Designation of Activity Zones.

ACTIVITY ZONE	CRITERIA FOR DESIGNATION	
<i>Primitive</i>		
Area is characterized by essentially unmodified natural environment of fairly large size. The area is managed to be essentially free from evidence of human-induced restrictions and controls. Motorized use within the area is not permitted.	At least 2 miles from all roads, railroads, or trails with motorized use.	At least 5,000 acres
<i>Semi-Primitive Non-Motorized</i>		
Area is characterized by a predominantly natural or natural appearing environment of moderate-to-large size. The area is managed in such a way that minimum on-site controls and restrictions may be present, but are subtle. Motorized use is not permitted.	At least 1/4 mile from Class II and Class I roads but less than 2 miles from some roads.	At least 2,500 acres
<i>Semi-Primitive Motorized</i>		
Area is characterized by a predominantly natural or natural-appearing environment of moderate-to-large size. The area is managed in such a way that on-site controls and restrictions may be present, but are subtle. Motorized use is permitted.	Within 1/4 mile of Class II roads but more than 1/4 mile from any Class I road.	At least 2,500 acres
<i>Motorized Natural</i>		
Area is characterized by a predominantly natural-appearing environment with moderate evidence of the sights and sounds of man. Resource modification and utilization practices are evident, but harmonize with the natural environment. Conventional motorized use is provided for in construction standards and design facilities.	Within 1/4 mile of Class I roads.	No size criterion

Figure 5. Activity Zone Map for the East Lake Panasoffkee Property.

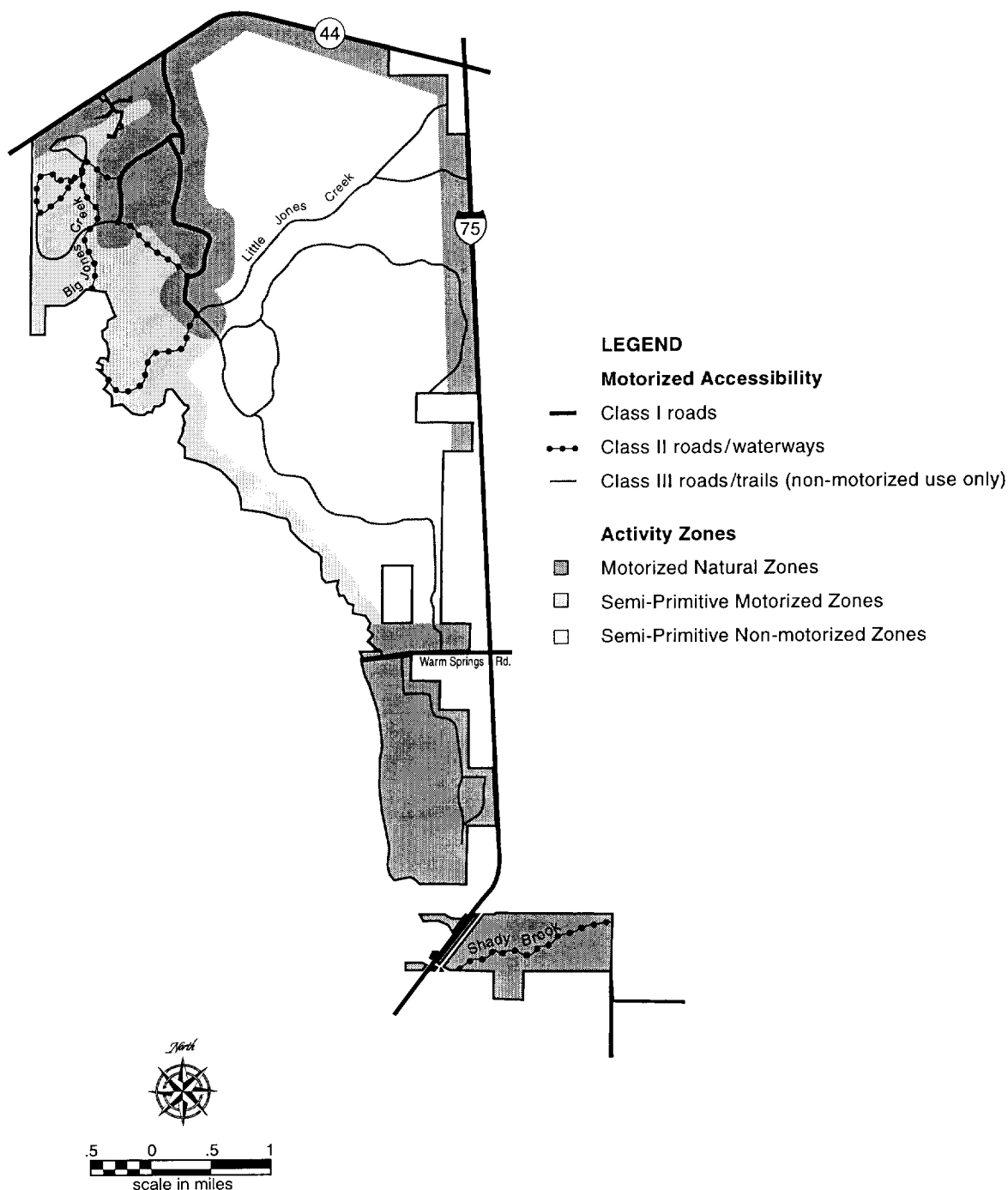


Figure 6. Classification System for Roads.

CONDITION	ACCESSIBILITY		
	<i>Open</i>	<i>Seasonally Open</i>	<i>Closed</i>
<i>Improved</i>	Class I	Class II	Class II
<i>Primitive</i>	Class II	Class II	Class III
<i>Trail</i>	Class II	Class III	Class III

to obstructing vegetation serves as the basis for a Class II designation, rather than a Class I designation, and the concomitant semi-primitive motorized activity zone designation for the shoreline area.

Little Jones Creek has been designated a Class II motor route downstream of the bridge and a Class III route upstream of the bridge. Class III roads and waterways are to be limited to non-motorized traffic only, i.e. foot traffic or, in the case of a waterway, to canoes or other non-motorized watercraft. The Class II designation extended to the downstream portion of Little Jones Creek reflects a need to place some degree of limitation on use of the creek by motorized boats. These designations are designed to achieve the dual management goal of: 1) preserving the natural and aesthetic qualities of the creek; and 2) ensuring the safety of recreational users. They also reflect practical constraints imposed by the shallow, meandering channel of the creek and by the low-clearance bridge crossing which acts as a physical barrier to use of the upstream segment by motorized boats.

Various options will be considered for limiting use of the downstream, Class II segment by motorized boats. Large, high-powered boats could pose a hazard to canoeists and other small craft using Little Jones Creek. Restricting use by high-powered boats would also maintain the quiet, primitive character and recreational value of the creek while reducing the potential for erosion and other physical damage in the stream channel. As sovereign submerged lands, the creek channel is currently open to motorized use on an unrestricted basis. The District will coordinate with the Florida Department of Environmental Protection's Division of

Submerged Lands and Environmental Resources in order to identify the most appropriate manner of restricting boating traffic for both recreational and resource management purposes. See sections of the plan devoted to access and management of stream channels for additional discussion of this issue.

Generally, the motorized natural zones associated with Class I roads are areas that exhibit moderated evidence of human influence or alteration. These are the zones that will be considered most suitable for minor structural improvements intended to accommodate permitted public uses, provided that the improvements are compatible with resource protection goals and will harmonize with the primarily natural surroundings. Such structural improvements may include parking areas, restrooms, picnicking facilities, boat or canoe launching areas, and environmental or interpretive centers. The semi-primitive motorized zone associated with the Class II roads and waterways may also exhibit moderate evidence of human alteration, but will be more strictly dedicated to the preservation of habitat values and the wilderness aesthetic than the motorized natural zones.

Approximately half of the property is encompassed within an area designated a semi-primitive non-motorized zone. The trail roads present in this portion of the property will be closed to motorized access, except for approved land management purposes and special uses, e.g. to accommodate approved hunting uses or access by disabled individuals. Like the semi-primitive motorized zone, management and public use will be directed toward preserving habitat values and a wilderness aesthetic. Only non-motorized

uses will be permitted in this portion of the property. The portion of this zone lying north of Little Jones Creek is closely associated with a planned equestrian staging area and may potentially emphasize use by horseback riders. Please refer to the discussion of recreational use for additional details on public use.

Access

Future access to the property will be designed to conform with the activity zone issues discussed above, which attempt to balance resource protection requirements with public usage. As directed by Chapter 373 of the Florida Statutes, the District must maintain or restore natural conditions on the lands under its ownership and must manage them in an environmentally acceptable manner. Public uses that are compatible with preservation objectives are also to be permitted. The manner in which access is controlled will exert tremendous influence over the District's ability to successfully satisfy the requirements of Chapter 373.

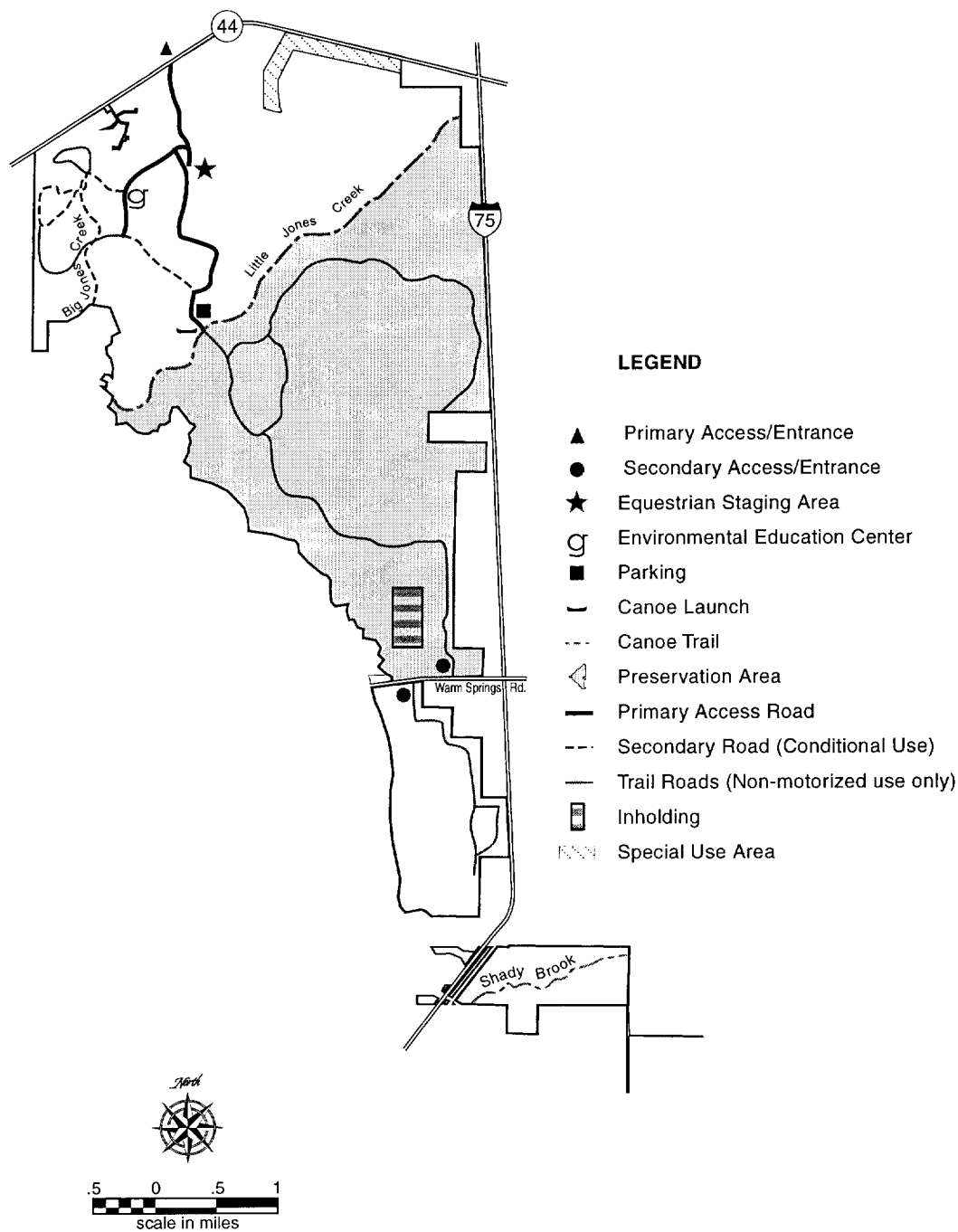
The primary entrance or access point will be located at the northern end of the property (see Figure 7). State Road 44 borders the property in this area and provides the most convenient avenue for accessing the site. It also coincides with an existing, stabilized roadbed which leads to remnant structures that pre-date the District's acquisition of the property. It is projected that several of these structures will serve as recreational facilities and/or help to support land management needs. The compact arrangement of the entrance road and structures will help to consolidate high-use areas and will simplify management.

Motorized vehicular access will be permitted through the primary access point and along the primary access roads as indicated in the conceptual land use plan (Figure 7). However, such access will be limited to daylight hours only and will not be allowed until such time as it can be adequately controlled and monitored. A system of fences and gates or other barriers may be required to prevent access to unauthorized areas and to limit the need for supervision.

As the most distant point to which motorized access will be permitted, the parking lot at the canoe launch will serve as the primary staging area for recreational users planning to utilize the lands south of Little Jones Creek. Access beyond the bridge will be reserved for foot traffic and those on horseback. A barrier or other means of preventing passage by motor vehicles may be required at this point, and a parking lot large enough to accommodate a substantial number of visitors will be provided. The District will ensure that vehicular access to the building complex is available to the public by the end of calendar year 1996, and that access to the Little Jones Creek parking area is available by the end of fiscal year 1997.

Secondary access points will be provided along Warm Springs Road (Figure 7). A small parking area and walk-thru entrances are the only improvements that will be constructed at these areas. This is a relatively isolated portion of the property and it does not hold the same recreational potential as the northern end. The majority of the land around these secondary access points is forested wetland that may be not

Figure 7. Conceptual Land Use Plan.



be amenable to public use during much of the year. As such, improvements to accommodate public use will remain minimal.

As noted in the preceding discussion of activity zones, access to Little Jones Creek by motorized watercraft will be managed in a manner designed to: 1) protect the physical integrity of the creek channel; 2) prevent disturbance of wading birds nesting in the historic rookery site; and 3) ensure the personal safety of recreational users. As sovereign submerged land, the creek channel is currently open to motorized use on an unrestricted basis. Physical constraints posed by natural obstructions and the shallow channel are the only factors limiting usage by boats. These factors, which include a low-clearance bridge, make motorized use of the upstream segment of the creek impractical and render areas upstream of the bridge inaccessible to motorized boats. Closure of the creek upstream of the bridge to motorized boating reflects both these practical limitations and the need to prevent use that would damage the creek channel. The canoe launch proposed for the bridge site will be designed to preclude the launching of motorized boats. In addition, the District will coordinate with the Florida Department of Environmental Protection's Division of Submerged Lands and Environmental Resources to identify an appropriate strategy for restricting boating traffic on the downstream segment of the creek in order to protect both the resource and recreational users. Refer to the section of this plan devoted to management of stream channels for additional discussion of this issue.

Preservation Area

The conceptual land use plan for the property (Figure 7) designates the entire central portion a "preservation area". This area is bounded on the north by Little Jones Creek and on the south by Warm Springs Road. Most of the preservation area is encompassed within the semi-primitive non-motorized zone discussed above, which reflects closure to motorized access. The preservation area designation dictates that an additional premium will be placed upon maintaining the wilderness character of this area, above and beyond the general management objectives and land use limitations implied by the activity zone designation. Public use of the preservation area will remain limited to foot traffic and those on horseback. A parking area immediately north of Little Jones Creek will provide a convenient access point for public users who must proceed on foot beyond that point. Recreational uses will be limited to those that can be conducted on foot or horseback including hiking, primitive camping and nature study. Low intensity hunting may also be permitted in the future, depending upon the results of an analysis that will evaluate the ability of the property to support sport hunting. Refer to the discussion of recreational uses for additional details.

Preserve Design Considerations

The science of conservation biology has defined several guiding principles for designing preserve areas (Soule and Simberloff, 1986). The primary rule of preserve design postulates that "bigger is better". Small preserves can fulfill important conservation objectives, including the protection of certain

highly-imperiled plant or animal populations. They can also satisfy demands for certain forms of outdoor recreation. However, only large areas are likely, or able, to encompass a diverse range of natural communities that can be managed with such necessary land management techniques as prescribed burning. And only the very largest can provide sufficient suitable habitat to ensure the long-term survival of genetically-viable populations of a complete assemblage or complement of species. The current extent of habitat fragmentation and alteration in Florida dictates that many of our existing preserves will not support populations of large mammals, and many other species, unless these areas are connected to one another by natural corridors that will permit the movement of wildlife between a linked network of preserves. Such linkages can effectively increase the "size" of a preserve and allow for gene exchange between populations that would otherwise be isolated from one another, thereby reducing the likelihood or incidence of inbreeding. High rates of inbreeding can quickly result in decreased health and fitness of a population and eventually lead to its demise.

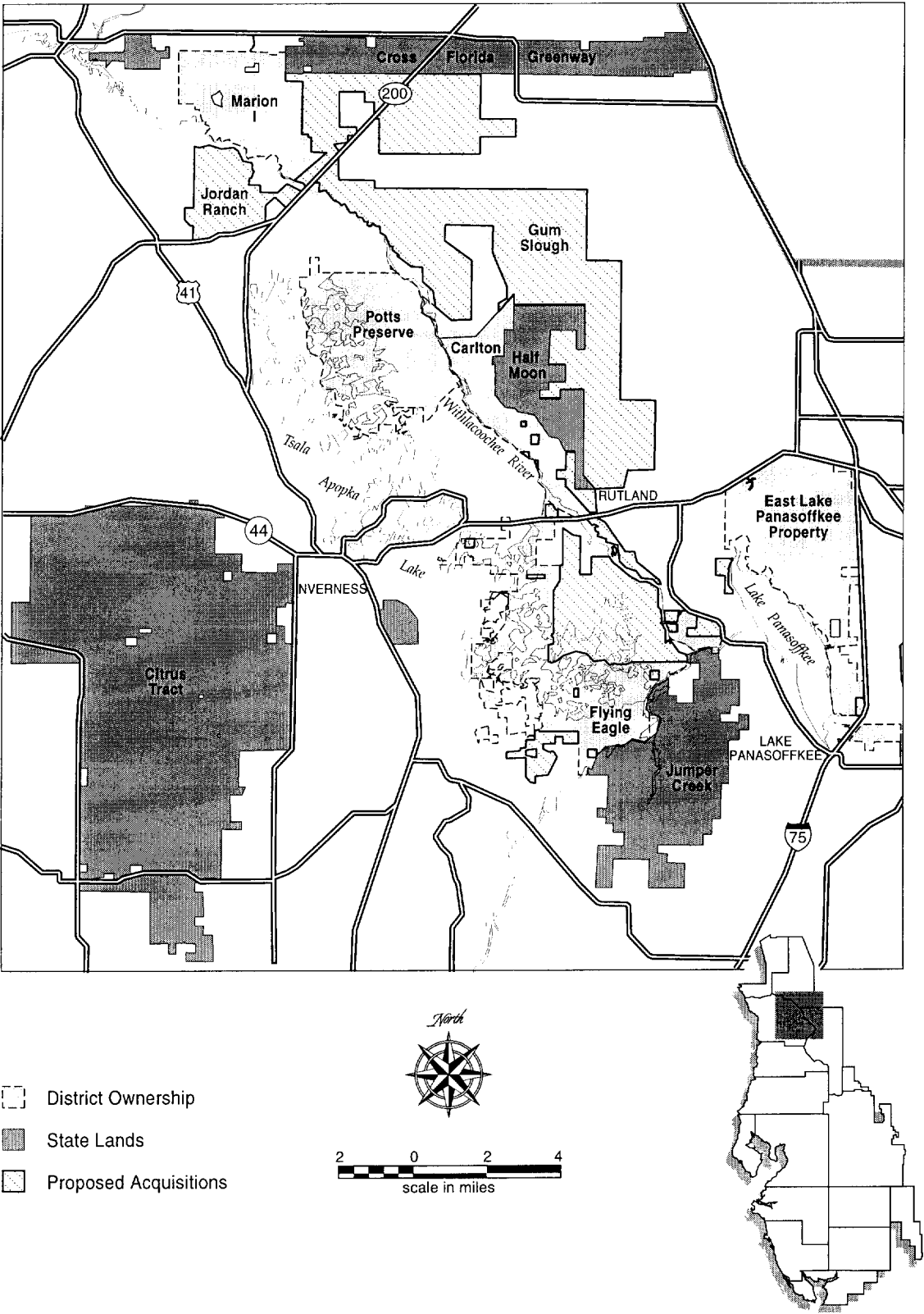
With a total land area of approximately 9,550 acres, the East Lake Panasoffkee property probably cannot provide the habitat base necessary to support viable populations of many species now present there. Most of the property's boundary is physically isolated from adjoining or surrounding lands by both natural and man-made barriers. Lake Panasoffkee represents a natural barrier that precludes the movement of most terrestrial species across the western boundary of the property (see Figure 2). The broad Interstate 75

right-of-way, which coincides generally with the eastern boundary of the property, also acts as a major barrier to wildlife movements. These impediments to movement restrict or limit opportunities for immigration and emigration of wildlife. The implications of this physical isolation place great importance on the need to maintain the existing connection to adjoining undeveloped lands north of State Road 44.

The lands immediately north and northwest of the East Lake Panasoffkee property are in private ownership; however, they have been retained in an essentially natural condition and currently provide a natural connection or corridor to nearby publicly-owned lands. The state-owned Half Moon property (5,320 acres) lies approximately 4 miles to the northwest (Figure 8). Other publicly-owned lands, consisting of the District's Carlton Tract (4,030 acres), Potts Preserve (9,350 acres) and Gum Slough (2,280 acres) properties, combine with Half Moon to form a contiguous mass of protected lands totaling approximately 21,000 acres. Other lands targeted for possible acquisition by the District as part of the Gum Slough, Marion 1 and Jordan Ranch projects may ultimately result in a network of linked or adjoining lands totaling approximately 35,000 acres. Acquisition of the remaining Gum Slough project area would also bridge a portion of the gap between this large mass of publicly-owned lands and the nearby East Lake Panasoffkee property, reducing the distance of separation to approximately 2 miles (Figure 8).

The District will investigate alternatives for bridging the gap between East Lake Panasoffkee and the existing Carlton/Half Moon/Gum Slough complex of

Figure 8. East Lake Panasoffkee property and other nearby public lands.



publicly-owned lands. These alternatives may include a combination of fee-simple acquisition and various less-than-fee alternatives. In order for a less-than-fee approach to be successful, it must achieve the habitat preservation objectives necessary to maintain a viable corridor for the movement of wildlife between the nearby properties. Such a connection would greatly increase the long-term habitat value of the East Lake Panasoffkee property. It would also enhance the value of the Carlton/Half Moon/Gum Slough complex.

Recreation

It is the policy of the District (Board Policy 610-3) that appropriate recreational usage of District-held lands be permitted, provided that the usage is compatible with water resource management and protection needs. Generally, the development and maintenance of approved recreational facilities must be at the expense of outside entities. Board policy directs that the developed facilities must be open to the public. Recreational activities that are not dependent on the natural resource values of a site, i.e. not resource-based, will not normally be allowed.

The District will be amenable to working cooperatively with Sumter County in the management of public use of the property. If Sumter County chooses to act as a local sponsor of public usage of the property, then they may be permitted to collect entrance fees or other user fees, provided that any revenues generated through the collection of such fees would be applied toward maintenance expenses or toward the development of additional on-site improvements. This requirement is consistent with guidelines stipulated in Board Policy 610-3. An expansion or

modification of the level of recreational use allowed by this plan may be considered in the future if Sumter County, or another appropriate cooperator, chooses to sponsor or supervise public use of the property. The development of any new facilities, or any expansion of permitted public use, would require approval of the District.

Permitted uses of the East Lake Panasoffkee property will include horseback riding, hiking, camping, canoeing, birding, fishing, picnicking and nature study. Bicycling will be permitted only on those roads that are open to motorized vehicles. Hunting may eventually be considered a permitted use, depending upon the results of an evaluation of the property's ability to support the activity. The District will complete such an evaluation by the end of calendar year 1996.

Prohibited uses of the property will include swimming and scuba diving. Restrictions on the use of Little Jones Creek by motorized boats may also be imposed, contingent upon securing authority or approval from the Department of Environmental Protection. Dogs and other pets will not be allowed on the property, and the removal or destruction of any native plants or wildlife will be prohibited, except as may be authorized through special permits or in order to satisfy land management needs. A more detailed discussion of several specific recreational uses is provided below.

Equestrian Use

A complex of structures that pre-date the District's acquisition of the property have been identified as an equestrian staging area in the conceptual land use plan (Figure 7). These structures include a multi-stall stable, two pole barns and an ancillary building.

All of the buildings were used to support the previous owner's ranching operations and may be ideally suited for the proposed use. The buildings must be determined to meet public safety standards before they can be made available for public use. Any building that cannot be upgraded to satisfy public safety codes through reasonable expenditures, or that is determined to be of limited practical or functional benefit to recreational users or land management staff, will be dismantled and removed from the property.

The central location of the proposed equestrian staging area is easily accessible to vehicles and lies in the heart of a large expanse of upland area that is suitable for horseback riding. Wetlands predominate in the remainder of the property and the limited uplands within that area consist primarily of hammock islands and oak scrub. The soils in most of these areas will not support intensive recreational uses. In addition, these sites lie within the Preservation Area (see Figure 7). The inability of lands within the Preservation Area to support intensive public uses without incurring severe impacts and reduction in resource value served as the primary motive for the designation. As such, equestrian use of the property will be restricted to upland areas north of Little Jones Creek and to a designated trail loop in the area south of Little Jones Creek. Creation of the loop trail will be completed by the end of fiscal year 1997.

Canoeing

A canoe launch is proposed for the bridge crossing of Little Jones Creek (Figure 7). Vehicular access will be permitted to this site and a parking area will be provided. This location places the launching site

nearer the downstream end of the creek and offers the user the options of traveling upstream toward the headwater spring or downstream toward the confluence with Lake Panasoffkee. Itineraries can consist of round trips that return to the launching site or may be planned as one-way excursions between the canoe launch and various points on the Lake Panasoffkee shoreline, thereby avoiding a strenuous, upstream journey. Although there are no public boat ramps or launching facilities on the lake, there is a private fish camp that can accommodate this optional itinerary and permit inclusion of the lake shoreline or Shady Brook and Big Jones Creek.

The wild and unimproved channel of Little Jones Creek can provide an outstanding opportunity for moderately-experienced canoeists and kayakers to explore relatively-inaccessible reaches of the property. The natural values and scenic qualities of the creek served as the basis for its designation as a Special Protection Area (see page 24). However, the same characteristics that make the creek attractive to paddlers can make it hazardous to share with other boaters. The narrow and meandering channel may be unsuitable for shared use by both large powercraft and paddlers. In keeping with the District's policy to promote resource-based public uses that are compatible with resource protection objectives, the District will seek legal authority to restrict or control use of the creek by powercraft. This approach will promote or encourage use by the less-obtrusive user group and preserve or restore conditions that are attractive to wildlife (see discussion of wading bird rookery, page 23, and discussion regarding activity zones and management of stream channels for additional details).

Private ownership of the lands surrounding the main headwater spring of Little Jones Creek represents the primary shortcoming associated with recreational use of the river. It prevents using the springhead as a launching area and precludes the District from promoting public use beyond the limits of the property. In deference to the privacy of this neighboring landowner, the District will clearly post the property line at this point and acknowledge the beginning of private ownership. As noted in the discussion of Special Protection Areas, the District will also explore alternatives for acquiring an interest in the lands at the springhead.

As the most distant point to which motorized access will be permitted, the parking lot at the canoe launch will serve as the primary staging area for recreational users planning to utilize the lands south of Little Jones Creek. Access beyond the bridge will be limited to foot traffic and those on horseback. A barrier or other method of preventing passage by motor vehicles may be required at this point, and a parking lot large enough to accommodate a substantial number of visitors will be provided.

Hunting

As noted previously in the discussion of preserve design considerations, it is questionable that the East Lake Panasoffkee property can provide a habitat base that will be adequate to support viable populations of certain species. This is attributable to both the size of the property and its isolation from adjoining natural areas. As a "stand alone" property its populations of white-tailed deer, wild turkey (*Meleagris gallopavo*), bobwhite quail (*Colinus virginianus*) and other typical game species

may not be adequate to support a high level of sport hunting. Public uses planned for the northern end of the property would require that any sport hunting program must be restricted to the area south of Little Jones Creek. The presence of major highways and a high-use lake along the borders of the property would require perimeter buffers, thereby placing additional limitations on the total land area that could be made available to hunters. These conditions would also preclude the use of high-powered firearms.

By the end of calendar year 1996, the District will complete an ongoing evaluation of the property's potential for sport hunting and will consult with the FGFWFC to determine if some form of low-intensity hunting may be accommodated. Low-intensity hunting may include such options as a short, low-quota archery or primitive weapons hunt; hunting for birds and other small game; or hunts designed for disabled individuals. It may also provide a strategy for controlling the property's burgeoning population of feral hog (*Sus scrofa*), which has caused considerable rooting damage in some wetland areas.

Camping

The District regularly permits camping on those lands that can support it without compromising resource protection objectives. Where it is allowed, camping must be confined to designated sites only. The East Lake Panasoffkee property is large enough to sustain limited camping use without unduly constraining other uses. One or two primitive, hike-in campsites will be designated within the Preservation Area south of Little Jones Creek. The site or sites will be located in the large patch of uplands

in the west-central portion of the property in order to maximize the distance from the Interstate 75 right-of-way. The site(s) will be chosen with the intention of minimizing impacts to natural areas and resident wildlife. The only improvements to the site(s) will consist of minimal clearing and provision of a fire ring.

One management concern associated with camping is related to the campers' propensity for building campfires. The practice generates possible sources of ignition for wildfires. It also encourages campers to collect wood from the surrounding environs, which disrupts normal nutrient cycling and diminishes the natural appearance of the area. However, campfires are a traditional indulgence in most campsites and they may be a safe indulgence given proper precautions. Campfires will be allowed in designated camping areas only and must be confined to established fire rings. The reigning backcountry ethic encourages "minimum impact" camping, which relies on the use of backpacking stoves in order to preclude or limit the need for campfires. This camping approach will be promoted for the backcountry sites discussed above where wildfire occurrences may be especially problematic and where a "picked clean" forest floor may diminish the wilderness experience.

In addition to the primitive campsite(s) discussed above, the District may also designate a larger campground in the area north of Little Jones Creek. Vehicular access is to be permitted to this portion of the property and will provide an opportunity for a less primitive camping experience. The site can be designed to accommodate group camping or equestrian camping, or both, and could provide such amenities as

restrooms, picnic tables, cooking grills and running water. The presence of such site improvements, in combination with the more intensive style of camping, would result in management and monitoring needs far beyond those required of the primitive site(s) discussed above. Before a campground of this nature can be accommodated, a local sponsor for the facilities must be identified. The property's location in rural, unincorporated Sumter County suggests that Sumter County would be the ideal sponsor for establishing and managing facilities of this nature.

Use of any of the site(s) discussed above, particularly the primitive hike-in site(s), will require special permits or reservations in order to provide prospective campers with a method of ensuring that a site will be available. This form of management would also allow the District to establish and enforce a carrying capacity for each site based on its ability to support sustained camping pressure.

Other Uses

Environmental Education

The natural systems of the East Lake Panasoffkee property provide an ideal setting for nature study and environmental education programs. The property is also readily accessible. Representatives of the Sumter County School Board have expressed interest in establishing an environmental education program that would utilize the site; however, funding constraints currently preclude the County from proceeding with development and implementation of a program.

A former hunting lodge has been identified as an environmental education center (Figure 7). At present, the log structure is very sound but may not meet public codes or construction standards for an educational institution. The District will reserve use of the structure for this purpose until such time as the County can secure funds to support the educational program and make any necessary improvements to the building. During the interim, the District will work with the County to accommodate school groups on an occasional, as-needed basis. Such visits may require temporary use of portable restroom facilities. If it is determined that the log structure will not be used as an education center, then the District will consider other potential uses for the building, including use as an interpretive center or visitor center.

Potable Water Supply Wells

As discussed previously, the City of Wildwood (City) has requested that a small portion of the East Lake Panasoffkee property be made available for development of two public water supply wells (see page 7). Water supply potential serves as one of the criteria by which the District measures a property's suitability for acquisition. As such, it is considered an appropriate use of District-owned lands on those sites that can sustain large-scale withdrawals of water without incurring unacceptable environmental impacts.

Any future installation of public supply wells on the property will be contingent upon meeting the regulatory requirements of the District's water use permitting program. The regulatory requirements, outlined in Chapter 40D-2 of the Florida Administrative Code, are designed to

provide site-specific determinations of an area's suitability for groundwater withdrawals and to ensure that any permitted withdrawals will not exceed the site's "safe yield", or ability to yield water without unacceptable impacts to surrounding natural systems. Impacts upon pre-existing water supply sources must also be considered.

Thus far, the City has not applied for the water use permit (WUP) that would be required before actual withdrawals of water could take place. The District will require that any future development of the two proposed public supply wells, including the preliminary installation of facilities for test pumping, must be authorized by appropriate permits and must be conducted in conformance with all pertinent permit conditions. As noted in the following discussion, which addresses the proposed Florida Agriculture Museum, the District also reserves the right to require that future wellheads, pump stations, and other associated facilities must be co-located with the Museum in the Special Use Area denoted in Figure 7.

Florida State Agricultural Museum

The East Lake Panasoffkee property is being evaluated as a candidate site for future development of the Florida Agricultural Museum (Museum). Plans for the Museum, which is currently housed at a temporary site in Tallahassee, call for a modern exhibition center that will display artifacts and educational exhibits related to Florida's agricultural industry. Other components of the proposed Museum complex include: a teaching garden; an arboretum; small-scale,

working agricultural operations; and replicas of an historic sawmill, turpentine still, dairy farm and native-American agricultural field.

A site selection committee has been appointed to evaluate all the candidate sites and has outlined a slate of site selection criteria. The criteria include: proximity to Interstate and major arterial highways; availability of infrastructure; proximity to population centers; community support; and an agricultural setting. It has also been determined that a minimum land area of 200 acres will be required for construction of the entire Museum complex. The East Lake Panasoffkee property appears to satisfy the selection criteria and the District has agreed to make a portion of the property available for such use, provided that certain conditions are met if the property is chosen as the final site.

The Special Use Area denoted in the Conceptual Land Use Plan (Figure 7) denotes the portion of the property that will be made available for the proposed Museum. All of the proposed site consists of altered lands that were converted to improved pasture by previous landowners. It is also the location most proximate to the Interstate 75 - State Road 44 interchange. Intrusion upon the surrounding natural landscape and upon recreational users of the property would be minimized by restricting the Museum to this site. It is also consistent with the management philosophy for the property, which dictates that intensive uses and significant structural improvements should be restricted to peripheral areas of the property. Large buildings and other major structural improvements associated with the Museum will be directed to the portion of the Special Use Area that fronts on State Road 44 to

reduce the degree of intrusion upon the interior of the property. The southern extension of the Special Use Area will be reserved for outdoor exhibits and working displays that would be less visible within the viewshed of the equestrian complex and other public use areas to the south.

In order for the proposed use to be consistent with the District's mission and land acquisition program, it was determined that water-related agricultural issues should receive considerable emphasis at the Museum. A detailed list of conditions was provided to Sumter County, which together with the City of Wildwood has served as a sponsor and vocal proponent of siting the Museum on the East Lake Panasoffkee property. A long-term lease will serve as the legal vehicle that would make the lands available for Museum development. Conditions of the lease would require, but are not limited to, the following: development of an outdoor environmental education program that addresses the protection of water resources and natural systems; an innovative site design that incorporates pervious parking areas, water-conserving landscaping and a wastewater reuse demonstration project; and a requirement that the Museum must be operated as a non-profit facility, with any fees or revenues generated through public use being applied solely toward operation and maintenance expenses.

As discussed previously, the City of Wildwood has requested that a small portion of the property be made available for the installation of two public supply wells. In order to minimize the impact of the proposed wells on the natural systems of the property, and to limit the degree of intrusion upon recreational users, the wellheads and associated facilities will be

directed to the extreme northeastern corner of the property. This location would also minimize construction expenses associated with pipelines and other physical improvements; however, it will also place it within the Special Use Area that has been reserved for development of the Museum. If both of these proposed uses are ultimately to be accommodated on the property, then the District reserves the right to require that all or a portion of the Museum complex must be integrated into the site of the wells.

The future co-location of the Museum and wellhead facilities would be dependent upon a determination that the Museum's agricultural land uses and physical facilities would not threaten or compromise the public supply potential of the site's groundwater resources. If it is determined that the two uses are not incompatible, then co-location would maximize the public benefits derived from use of the property and would allow interpretive or educational displays associated with the water supply function to be integrated into the Museum.

Utilities and Other Public Facilities

As stipulated in Board Policy 610-3, utility lines and other public rights-of-way that are not directly associated with District functions or approved recreational development will not be allowed on District lands except as a last resort in cases of overwhelming public interest. At present, the only utilities on the property serve on-site facilities and satisfy the above requirement. Future plans to upgrade State Road 44 to a 4-lane highway may require additional right-of-way and result in appropriation of District lands adjoining the

existing right-of-way. The District will ensure that this, and any other future public infrastructure proposed for the East Lake Panasoffkee property, is clearly demonstrated to be in the public interest and has been designed to minimize impacts to District-held lands to the greatest extent possible. Generally, the District will also require that new utility lines must be concentrated among existing lines whenever possible.

Scientific Research

The use of District-owned lands for bona fide scientific research is promoted as an appropriate use of these lands, provided that the projects will not result in long-term impacts to the property's resources. The District will make the East Lake Panasoffkee property available for such research. Proposals to conduct research on these lands must be submitted in advance of the proposed work and will be considered on a case-by-case basis. Typically, the District will require interim and/or final reports that summarize the results or information generated by the research and copies of any associated articles or other publications. The subject of the research must be resource-based and must employ methods that would be considered acceptable by the relevant research community.

Commercial Silviculture

Consistent with Governing Board Policy 610-3, commercial silvicultural operations will be prohibited on the property. Such consumptive usage is incompatible with statutory directives to maintain or restore a natural condition on these lands. This prohibition should not be construed to limit the District's right to conduct salvage harvests or engage in tree-thinning

procedures associated with reforestation projects. Whenever possible, prescribed fire will be used to thin any natural canopies that have become so dense as to degrade habitat values.

Cattle Grazing and Hay Harvests

Governing Board Policy 610-3 directs that cattle grazing may be permitted on District lands when it will provide a significant resource management or security benefit. Much of the East Lake Panasoffkee property was grazed by cattle up to the time of the District's acquisition of the property, and an estimated 1100 acres of the total land area consist of improved pastureland. Grazing that remains confined to improved pastures would result in a minimum of impacts to adjoining natural areas, and it may be consistent with District policy to lease grazing rights to some of the property's pastures. Portions of the northernmost pastures may be grazed, or harvested of hay, with a minimum of impacts upon either natural systems or recreational users. The District will evaluate the feasibility of leasing these pastures as an interim or short-term measure. If it is determined that a lease should be offered over these pastures, then the future stocking rate will be based upon achieving sustainable productivity and will be determined in consultation with the Natural Resources Conservation Service.

Pastures that are only "semi-improved", or that are considered capable of passive restoration through natural successional processes, will not be considered as candidates for grazing leases. The presence of cattle in these areas would not be consistent with resource protection and restoration goals for the property. In addition to such resource-based

considerations, the District must weigh the potential for conflicts between cattle grazing and other uses of the property, particularly recreational use. The grazing of cattle in the interior reaches of the property, which support healthy or recovering natural systems and have been designated a Preservation Area, will not be considered appropriate for cattle grazing. Exclusion of cattle from the interior pastures will promote the restoration of these areas through passive means and will maintain conditions that are suitable for approved recreational activities.

Any revenues generated by cattle or haying leases will be applied toward expenses associated with the District's land management program. As such, the leases can provide a clear public benefit that is consistent with preservation goals, provided that they are properly administered as an interim measure between the periods of initial land acquisition and planned, active restoration of a natural state.

RESOURCE PROTECTION

Land Management

The District engages in a variety of land management activities designed to protect or enhance the natural resource values of its properties and to ensure public safety. The following is a discussion of some of the land management practices and resource protection measures to be employed at the East Lake Panasoffkee property.

Prescribed Burning

Much of the East Lake Panasoffkee property supports vegetative communities that are dependent upon recurring fire for their long-term maintenance and viability. These communities include the freshwater marshes, pine flatwoods, sandhills and oak scrub areas and account for approximately 1195 acres, or about 12 percent of the total land area. In the prolonged absence of fire, the structure and species composition of these communities would gradually change and they would be of reduced value to wildlife. The progressive accumulation of ground litter and other natural fuels would also, over time, increase the threat and intensity of dangerous wildfires.

Given the degree to which the Florida landscape has been altered and fragmented by development, the natural mechanism of lightning-induced fires cannot be expected to fulfill the fire needs of these communities. The use of carefully-controlled prescribed fire will be necessary to maintain the natural character and value of these portions of the property. This important land management tool will also reduce the threat of intense, destructive wildfires and lessen the risk of escape to adjoining privately-owned lands.

The seasonality and frequency of prescribed fires will be tailored to mimic the natural incidence of fire in each of the respective communities. Generally, prescribed fires in all fire-maintained communities should be conducted during the growing season, which extends from early spring to late summer. This period coincides with the period of most intense lightning activity. The natural incidence of fall and winter fires in pre-settlement Florida is projected to have been quite low. Prescribed fall or winter fires should be similarly rare in occurrence to ensure that fire events are attuned with the life histories and phenologies of resident species.

Fire frequencies for the various communities can differ substantially. Estimates range from intervals of 1-10 years for freshwater marsh; 1-8 years for pine flatwoods; 2-5 years for sandhills; and 20-80 years for scrub (Florida Natural Areas Inventory, 1990). Fire frequencies for freshwater marsh and pine flatwoods probably tend toward the longer end of the range, while oak scrub may burn less frequently than projected by the 20-80 year estimate. The latter estimate also encompasses sand pine scrub and rosemary scrub, which burn much less frequently than oak scrub.

Actual fire frequencies should and will be based on a site-by-site evaluation with the ultimate goal of maintaining community composition. Marshes should be burned at a frequency sufficient to prevent large-scale invasion by shrubs and hardwoods. Fire frequencies for oak scrub vegetation should be designed to maintain an oak shrub subcanopy that does not exceed about 3.5 meters in height. This is the maximum height at which scrub vegetation can continue to provide high quality habitat for

scrub jays. Although scrub jays have not been sighted on the property, they can be considered an "indicator" species for scrub and management for scrub jays should maintain conditions that are generally suitable for the full range of scrub species. In addition, the following section of this plan addresses a conceptual plan to reintroduce scrub jays to the property. A fire frequency of less than 8 years should be avoided to allow a minimum of recovery in the scrub vegetation and a resumption of acorn mast production.

A carefully designed network of firebreaks must be established within and around the property in order to adequately control prescribed fires. These firebreaks must be configured to define individual fire management units. Management units should generally be as large as possible so that fires can burn through ecotones and move in a more natural, spotty fashion across the landscape. The resulting patchwork of burned and unburned stands within a unit will produce a mosaic of vegetation at various stages of maturity and thereby maximize habitat diversity. Individual species often favor, or may even be restricted to, stands that are at a particular state of maturity. Existing features that can function as effective firebreaks, including roadways and forested wetland communities, should be used as such to the greatest extent possible to minimize the need for cutting disced firebreaks through undisturbed vegetation.

In some areas, prescription parameters for fires will be dictated more by practical constraints than by the natural ideal. Some of the fire-maintained vegetation occurs adjacent or proximate to major public roadways. Smoke produced by fires in these areas may pose an extreme hazard to

motorists and may preclude the use of prescribed fire entirely. Alternatively, the division of these areas into very small burn units may reduce the volume of smoke generated by individual fires and thereby simplify control and reduce safety concerns. A previous landowner cleared a checkerboard pattern of alleys through much of the oak scrub and some of these alleys should be maintained to serve as firebreaks and subdivide the scrub into more easily managed units. Roller chopping and other mechanical methods of reducing vegetative cover may also be required to supplement or supplant the use of prescribed fire in some areas along roadways. These management approaches to maintaining the oak scrub vegetation may be especially critical and relevant to the following proposal to reintroduce scrub jays to the property.

Habitat Restoration

Chapter 373 of the Florida Statutes directs that the District must attempt to restore a natural condition to altered lands under its ownership and management whenever practicable. Habitat restoration needs for District-held lands are currently being assessed on a District-wide basis as part of an effort to prepare a comprehensive, fully-integrated restoration plan. The restoration plan will distinguish priority sites and identify restoration alternatives according to guidance provided in Board Procedure 61-10.

It is unlikely that any large-scale restoration projects will be implemented on the East Lake Panasoffkee property until the integrated plan has been completed. However, there are some relatively simple measures that can be undertaken to rehabilitate areas that have been subjected

to limited alteration. A previous land owner linked several isolated marshes in the northwestern corner of the property by excavating a network of shallow ditches and swales, ostensibly in order to drain adjoining rangelands during very wet periods. Although these wetlands may have naturally commingled during very wet periods, the ditches and swales accelerate drainage to down-gradient areas. An investigation will be conducted to evaluate the feasibility and effectiveness of plugging or backfilling segments of the ditch system in order to restore historic hydroperiods. The marshes drain eventually to an off-site marsh and the impact of the proposed restoration on the adjoining property must be carefully considered.

Several old tram grades or logging spurs that project a short distance into stands of floodplain swamp present additional opportunities for hydrologic restoration. The spurs were constructed to facilitate logging in these areas and impede or disrupt the normal flow of water through the swamp. Wholesale extraction or removal of the fill composing the spurs would be impractical and destructive to adjoining swamp vegetation; however, breaches could be excavated or culverts installed to restore natural drainage patterns. These sites will be evaluated to determine the merit of such measures.

One of the most notable characteristics of the property is the great extent of oak scrub vegetation that is represented there. Approximately 660 acres of scrub occur in patches scattered across the property (see Figure 3). These patches are restricted to high sites, generally at elevations ranging between 45 and 50 feet above sea level, and have sandy soils that are very well drained. Much of Florida's original scrub vegetation

has been lost because the high, dry nature of scrub areas makes them highly coveted for development. The Florida Natural Areas Inventory has identified scrub as a globally-imperiled natural community on the basis of its rarity and rapid, continuing destruction. It is a community that is unique to Florida and one that supports an astonishing number of rare species. Public ownership of the East Lake Panasoffkee property will ensure the preservation of a significant expanse of this threatened community.

The natural value of scrub dictates that a premium be placed on the restoration or rehabilitation of altered or degraded scrub areas, particularly when it can be achieved through relatively passive means. Prior to the District's acquisition of the property, the existing oak scrub vegetation had been exposed to regular mechanical disturbance by roller chopping and mowing. These techniques were employed as a method of preventing overgrowth of the vegetation and minimizing the hazard of wildfire. A checkerboard pattern of cleared alleys was also created in much of the scrub, presumably to partition the dense vegetation and permit easier access into these areas. Rehabilitation of the oak scrub will be promoted by allowing the vegetation to regenerate naturally. District staff involved in official duties will avoid using the cleared alleys as roadways by blocking or posting the majority of them.

As noted in a preceding discussion of prescribed fire, the need to control smoke when conducting prescribed burns near highways will make it difficult to employ prescribed fire in some of the scrub areas. A strategically selected network of the cleared alleys may be maintained in an open state in order to serve as fire breaks and to create

workable burn units. Continued roller chopping may necessarily serve as the preferred management technique in scrub that directly adjoins highways and cannot be subjected to prescribed fire. However, passive restoration of scrub will be promoted to the greatest extent possible by avoiding roller chopping and other mechanical treatments in favor of prescribed fire.

Much of the pastureland that directly adjoins the scrub vegetation is presumed to have supported scrub prior to conversion to pasture. This presumption is based on an analysis of soils and topographic setting. In some areas, scattered occurrences of scrub vegetation have become established at the scrub-pasture interface, suggesting that some scrub species may progressively recolonize the pasture. This natural recovery will be permitted to proceed. Mowing and other land management activities that could delay or hinder this natural expansion of the scrub will be avoided at these sites.

Scrub Jay Reintroduction

The Florida Scrub Jay has been designated a threatened species by both the United States Fish and Wildlife Service (USFWS) and the Florida Game and Fresh Water Fish Commission (FGFWFC, 1994). The degree of imperilment and protection denoted by this designation requires that the USFWS initiate a program to promote recovery of the species. A primary objective of the adopted recovery plan is the reestablishment of scrub jay populations in areas from which they have been eliminated (USFWS, 1990).

Although scrub jays have not been sighted by District staff during surveys of scrub habitat at the East Lake Panasoffkee property, there is evidence which indicates that jays occurred there historically. Sightings of scrub jays along the U.S. Highway 44 right-of-way at the northern end of the property have been documented as recently as 1981 (Cox, 1987). Other reports have documented the occurrence of jays in close proximity to the property. These include a sighting immediately east of the property along Interstate 75 in 1978 (Bob Repenning, pers. comm.) and repeated sightings approximately 1.5 miles north of the property from 1980 to 1983 (Cox, 1987).

The nearby Carlton/Half Moon/Gum Slough complex of public lands, noted previously in the discussion of preserve design considerations (see page 33 and Figure 8), provides habitat for a small number of resident scrub jays that are apparently part of a population that extends into the Big Scrub region of Marion County. The Cross Florida Greenway and adjoining lands in Marion County have been designated a Strategic Habitat Conservation Area for scrub jays and the Carlton/Halfmoon area, combined with other lands in northern Sumter County, has also been distinguished as important scrub jay habitat (Cox et al., 1994). It is conceivable that a large, diffuse population of scrub jays extended historically across a patchwork of scrub habitat stretching from the Big Scrub region to the present-day East Lake Panasoffkee property.

Recent research has indicated that jays may possibly be restored to a site from which they have been eliminated by relocating birds from a secure donor population to the formerly occupied site (Mumme and Below, 1995). The current absence of scrub jays

from the East Lake Panasoffkee property and the availability of an estimated 660 acres of oak scrub habitat suggest that the property may serve as an ideal site for the reintroduction of scrub jays. The proximity of the property to existing scrub jay habitat suggests further that this region may eventually be capable of supporting a large, self-sustaining population. Simulations have been conducted to predict extinction rates among scrub jay populations of various sizes (Fitzpatrick et al., 1991). A population consisting of 30 territories is predicted to have a 90 percent chance of surviving beyond one hundred years and it has been suggested that this represents the smallest population that could be considered adequately protected. Approximately 750 acres of managed scrub would be required to support such a population. Dispersal ranges for scrub jays indicate that the East Lake Panasoffkee scrub, Carlton/Halfmoon complex, and Big Scrub/Cross Florida Greenway lands could support an inter-breeding metapopulation of jays that would meet the recommended habitat requirements. Very few such areas remain in Florida.

The District will evaluate the feasibility of conducting a scrub jay reintroduction project at the East Lake Panasoffkee property. Given the protected status of this species, permits from the USFWS and FGFWFC will be required to conduct such a project. The cooperation and assistance of these agencies, and of recognized authorities on scrub jay ecology, will be required for an appropriate analysis to be conducted. The identification of a suitable donor population will represent an especially critical need. The Ocala National Forest supports one of the most secure populations of the scrub jay and may serve

as an ideal donor population. Other critical issues will revolve around considerations of long-term management of the on-site scrub; the importance of maintaining a natural linkage with the Carlton/Half Moon area; and threats or constraints posed by surrounding development and nearby roads.

Management of Stream Channels

Three separate springfed creek systems are encompassed, wholly or in large part, within the East Lake Panasoffkee property. All of the short and ill-defined Big Jones Creek drainage is protected within the property, as is the majority of Little Jones Creek and most of the downstream reaches of Shady Brook. The combined flow of these creeks, which discharge into Lake Panasoffkee, account for approximately 35 percent of the entire water budget of Lake Panasoffkee. They also rank as some of the most scenic and environmentally-significant features of the property. As important components of a larger ecosystem, and as conduits that permit human access and recreational use in remote natural areas, the proper management and protection of the creeks will be essential if their natural and recreational values are to be preserved.

The Lake Panasoffkee shoreline was "meandered" by the Federal government in 1845, thereby establishing the lake bottom as sovereign submerged lands under the ownership and management of the State of Florida. State authority extends upstream from the lake to include the channels of the on-site creeks. This greatly limits the District's authority and jurisdiction over the water column and streambed in these areas, and hinders the District's ability to properly

manage the property. The District will coordinate with the Florida Department of Environmental Protection's Division of Submerged Lands and Environmental Resources for a means whereby appropriate protective measures may be implemented.

The focus of any in-stream management actions that would be implemented by the District, and that would require authority over submerged lands, will revolve around placing limitations on access by motorized boats. As sovereign submerged lands, the creek channels are currently open to motorized use on an unrestricted basis. Little Jones Creek has been designated a Class II motor route downstream of the on-site bridge and a Class III route upstream of the bridge (Figure 5). Class III roads and waterways are to be limited to non-motorized traffic only; as such, the segment of Little Jones Creek upstream of the bridge will be reserved for canoes and other non-motorized watercraft. The physical characteristics of the upstream segment make it impractical for use by motorized boats and it is unlikely that this portion of the creek has historically supported any substantial motorized boat traffic. However, the Class II segment downstream of the bridge has historically been traversed by motorized boats, particularly airboats, during periods of high water.

The Class II designation extended to the downstream portion of Little Jones Creek reflects a need to place some degree of limitation on use of the creek by motorized boats. These limitations will be designed to achieve the dual management goal of: 1) preserving the natural and aesthetic qualities of the creek; and 2) ensuring the safety of recreational users. Large,

high-powered boats could pose a hazard to canoeists and other small craft using Little Jones Creek. Restricting use by high-powered boats would also maintain the quiet, primitive character and recreational value of the creek. The restoration of conditions suitable for establishment of a wading bird rookery may prove to be an additional benefit, although it is unknown if use of the channel by more disruptive boats played a role in the apparent inactivity of the rookery site. A variety of options will be considered, ranging from a complete closure to boats powered by internal combustion engines, to seasonal or case-by-case closures dictated by wildlife usage of the rookery or other nearby sites. Alternatively, motorized boats could be required to operate at idle speed while in the creek channel to ensure the safety of recreational users and maintain quiet, primitive conditions.

Boat access to Shady Brook and Big Jones Creek will not be actively controlled by the District. Limitations posed by the physical characteristics of those channels should be adequate to prevent inappropriate or destructive access or incompatible use. If a passive, non-regulatory approach to management of those channels proves to be inadequate, then the District will consider securing authority to control access to them.

There are other potential threats to the creek systems that will merit management attention. The District's aquatic plant control program will be called upon as necessary to control the growth of non-native, aquatic pest plants. In addition, the District will initiate a hydrologic monitoring program that will track stream flow. Refer to the following section of the plan for additional discussion of this issue.

Hydrologic Monitoring

As noted previously, the City of Wildwood (City) has requested that a small portion of the East Lake Panasoffkee property be made available for the installation of two public supply wells (see page 7). Withdrawals of groundwater for public supply purposes have demonstrated a clear potential to depress groundwater levels in the vicinity of withdrawal sites and to thereby degrade nearby, above-ground natural systems that are sustained by groundwater sources of water. Little Jones Creek, Big Jones Creek and Shady Brook are supported by groundwater contributions from nearby springs. These groundwater contributions may account for all or most of the baseflow during much of the year. There are also several isolated wetland systems in the northern end of the property in close proximity to the site where the proposed wells would be located. Water levels and hydroperiods in isolated wetlands are often determined by groundwater levels.

Water use permits (WUPs) issued for public supply wells typically require long-term monitoring of local groundwater levels and wetland conditions. This allows pumpage-related impacts to be easily discerned, and may trigger the implementation of appropriate mitigative measures. Any WUP issued to the City for the proposed wells will include such requirements; however, the initiation of monitoring and data collection would probably coincide closely with the initiation of pumping. The short period of record resulting under this scenario may not be adequate to provide a truly accurate appraisal of pre-pumpage baseline conditions.

The District will promptly implement a basic monitoring program on the property, in anticipation of future public supply withdrawals, in order to provide the best possible baseline information on which to base any future monitoring conditions and mitigation requirements associated with a WUP. Monitoring will emphasize the collection of data on streamflow in the property's creeks and wetland levels in appropriate isolated wetland systems. There are several uncapped wells on the property that may also be useful for direct monitoring of groundwater levels. Levels in the surficial and Floridan aquifers are already monitored by the District's Regional Observation and Monitoring Program (ROMP) at one on-site monitoring station near Coleman's Landing (Figure 2). The data collected under this proposed monitoring program will provide a valuable record regardless of the final outcome of the City's effort to establish wells on the property. Surrounding land uses and off-site withdrawals of groundwater may pose a similar, equivalent threat to the property's natural systems.

Abandoned Wells

There are several abandoned wells on the property that may represent a threat to water quality if they are not properly plugged or capped. Open wells provide a direct connection between the ground surface and underlying aquifers and can serve as an avenue for the introduction of contaminants to groundwater systems. Free-flowing artesian wells may also discharge groundwater to surface systems. The chemical and physical characteristics of groundwater can be distinctly different

from those of surface water and the discharge of groundwater to surface systems can alter or degrade natural conditions.

Abandoned wells that are not anticipated to serve a land management or land use function will be plugged in conformance with District guidelines. Open wells that may serve as monitoring sites will be securely capped to protect the property's groundwater resources. At least one free-flowing artesian well is present at the southern end of the property. Efforts to squelch the continuous flow from this well by capping have been thwarted by vandals and a more definitive plugging solution will be attempted.

Control of Exotic Species

The invasion of native communities and ecosystems by exotic, non-native species of plant life and wildlife is widely recognized as one of the primary threats to the environmental integrity of Florida's remaining natural areas. Non-native species, functioning in an environment that is free of the population controls typically imposed by their natural predators and pathogens, can often displace native species and greatly diminish the ability of natural areas to provide suitable habitat. The District has adopted a formal procedure (Board Procedure 61-9) to address the control of exotic species in response to the severity of this threat.

The East Lake Panasoffkee property appears to have been spared any large-scale invasions by exotic species other than hogs. However, there are numerous exotic plant species that pose a potential threat and District staff will remain vigilant for occurrences of these species. Control

measures will be implemented as necessary in accordance with the guidance established in Board Procedure 61-9. Species that are especially likely candidates for future invasion here, and that will warrant a prompt and aggressive response to prevent them from gaining a foothold, include cogongrass (*Imperata cylindrica*), tropical soda apple (*Solanum viarum*), skunk vine (*Paederia foetida*) and air potato (*Discorea bulbifera*).

Feral Hog Control

Spanish explorers introduced the feral hog (*Sus scrofa*) into Florida during the 16th century. Since then, this non-native species has flourished in an environment that effectively lacks any natural predators. Hogs now represent a significant land management problem in many natural areas, and their presence in large numbers is incompatible with the District's most fundamental land management goal of preserving or restoring the land's natural state. The disturbance caused by hog's rooting activities can severely damage natural vegetation in floodplain swamps, hammocks, pinelands and herbaceous wetlands. Hog rooting also creates conditions that promote invasion by exotic plant species (U.S. Department of the Interior, 1989), can significantly affect surface drainage or sheetflow through wetland sites, and can damage archaeological sites. Hogs are also prone to feed on acorn mast. Competition for the mast produced in the property's oak scrub may reduce the value of these sites for native species and may aggravate any future effort to reintroduce scrub jays.

Considering the fecundity of feral hogs, their tendency to become trap-shy, and the facility with which they can move between neighboring properties, trapping methods are not typically effective as a sole means of controlling hog populations. However, the East Lake Panasoffkee property is isolated from surrounding lands by barriers that may greatly reduce the incidence of immigration. This factor may increase the potential effectiveness of trapping at this site.

The District will consider the timely implementation of a trapping program in order to initiate some control over hog numbers before the population increases to an extent that may require more aggressive measures. Board Procedure 61-9 addresses a full range of options for the control of hogs. If trapping proves to be an ineffective control measure, then alternative methods will be employed as necessary.

Gopher Tortoise Relocations

The Florida Game and Fresh Water Fish Commission (FGFWFC) has designated the gopher tortoise (*Gopherus polyphemus*) a Species of Special Concern. This designation prohibits the taking of gopher tortoises and reflects an ongoing, rapid loss of gopher tortoise habitat and an associated decline in tortoise numbers. As part of the FGFWFC's effort to preserve this species, permits are occasionally issued which authorize the relocation of tortoises from areas scheduled for development to areas that will be protected from development. Generally, wildlife relocation projects are considered to be a conservation technique reserved for situations of last resort and are permitted only when there are no practical alternatives. The potential drawbacks of wildlife relocation projects, which include

the possible spread of disease, disruption of locally-adapted populations, and exceeding a given habitat's carrying capacity, require that relocation projects must be conducted very carefully on the rare occasions when they are considered appropriate.

In response to an increased number of requests to make its lands available for tortoise relocation projects, and in recognition of the threat posed by a recently-discovered respiratory disease that is attacking Florida's gopher tortoise populations, the District has adopted a formal policy to guide the review of proposed tortoise relocation projects (Board Policy 610-8). One condition of the policy requires that a pre-existing tortoise population must have been eliminated from the proposed receiving site, or reduced to a density below 0.4 individuals per acre, in order for a relocation to take place. Some of the upland areas located in the interior of the East Lake Panasoffkee property may satisfy this critical condition. It is not unusual for lands that have been dedicated to agricultural land uses, and which would otherwise provide suitable habitat for tortoises, to be devoid of tortoises as a result of the agricultural operations. Limited field reconnaissance of the property suggests that tortoises may be nearly absent over much of the area. In addition, the property's extensive floodplain swamp completely envelopes several large expanses of suitable upland habitat and forms a natural barrier to tortoise movement. This physical barrier will impede recolonization of such areas; it also would ameliorate concerns associated with the disruption of locally-adapted populations and spread of disease if tortoises were to be reintroduced to the site through relocation. The District reserves the right to initiate or encourage a relocation project that would restore tortoises to

portions of the property from which they have been eliminated. Any future proposal to relocate off-site tortoises to areas within the property, whether initiated by the District or by an outside interest, will be reviewed on a case-by-case basis to ensure consistency with the guidelines provided in Board Policy 610-8.

Fences and Signage

District policy requires that the perimeter of all District-owned properties be fenced (Board Policy 610-3). A perimeter fence will be maintained around the East Lake Panasoffkee property in accordance with that policy. Internal sections of fence that do not fulfill essential land management or security functions will be dismantled. These include remnants of cross fencing in areas that were formerly grazed by cattle.

Standard District signage that identifies the District as the landowner will also be maintained around the perimeter of the property, with the exception of specified public access points. Access points for recreational users will be marked with signs that clearly acknowledge the public's right to enter and will include informational displays that summarize permitted and prohibited activities. Any signs otherwise required by law or statute will also be posted as necessary.

Interior signage that directs public users to the various facilities or public use areas will also be erected on the property. These will include signs that clearly direct vehicular traffic within those areas open to vehicular access, and standard recreational trail markers along trails open for hikers, equestrians and canoeists.

Security

The District's land management staff will maintain a significant presence on the property through the course of conducting normal land management operations. Supplemental security is provided by a certified law enforcement officer who resides on the property and patrols the area during off-duty hours. The after-hours presence provided by a resident security officer is essential to maintaining security and will be continued.

The primary method of securing the property to prevent unauthorized activities will be through strict control of vehicular access. As noted in a preceding discussion of access, a network of stabilized roads in the northern section of the property will be opened to vehicular access during daylight hours. Vehicular access will not be permitted on these roads until adequate fencing and signage, and an appropriate level of supervision, are in place to prevent motorized access to other portions of the property.

If Sumter County or some other outside entity agrees to sponsor or supervise public access and recreational use of the property, then the above described strategy for maintaining security and controlling access may be amended. The District will remain amendable to cooperative management approaches that would enhance the security of the property, provided that such a cooperative approach would not compromise the resource protection or recreational use aspects of the District's management strategy.

ADMINISTRATION

External Coordination

The District must coordinate with many outside public agencies and private interest groups in order to effectively manage its properties. This section identifies those management and land use activities which cross, or potentially cross, the limits of jurisdictional authority and interest and will require outside coordination.

United States Fish and Wildlife Service

The United States Fish and Wildlife Service (USFWS) is the federal agency charged with primary responsibility for protecting the nation's wildlife resources. That responsibility includes administration of the Endangered Species Act (ESA). The USFWS may be consulted regarding special management needs for any species that is protected under the provisions of the ESA and is known to occur on the property. At present, such species include the bald eagle and wood stork. As noted previously, the on-site bald eagle nests will be protected and managed in accordance with the formal guidelines promulgated by the USFWS.

The Florida scrub jay, which is not known to occur on the property but is suspected to have occurred historically, has been designated a threatened species under provisions of the ESA. As such, the District's proposal to reestablish a resident population of scrub jays on this property through relocation will require assistance and approval from the USFWS. The District will confer with USFWS to identify the data requirements and other prerequisites for gaining official approval to implement the proposed reintroduction project.

Florida Game and Fresh Water Fish Commission

The Florida Game and Fresh Water Fish Commission (FGFWFC) is the agency with primary responsibility for protecting and managing the state's wildlife resources. As such, FGFWFC personnel monitor activity at the property's bald eagle nesting sites. The District will coordinate closely with FGFWFC to acquire data regarding future nesting activity, and will consult with the agency regarding a determination of the property's potential to support sport hunting. FGFWFC, in association with USFWS, will also exercise oversight of the proposed scrub jay reintroduction project.

Florida Department of Environmental Protection

The District will coordinate closely with the Florida Department of Environmental Protection (DEP) in order to implement several of the initiatives set forth in this plan. The Division of Submerged Lands and Environmental Resources will be responsible for reviewing and negotiating conditions of a submerged lands management plan that would confer authority to the District for the enforcement of appropriate control over boating access to Little Jones Creek.

A recent rule enacted as Chapter 62-521 of the Florida Administrative Code has established wellhead protection requirements that will be enforced by DEP. The public supply wells proposed for the property by the City of Wildwood must be designed and constructed in conformance with Chapter 62-521. Habitat restoration projects targeting wetland systems, or that will alter existing drainage and stormwater management systems, may require permits

from DEP and the District will consult with DEP to ensure that all such projects conform with adopted rules and accepted design standards.

The preceding discussion of preserve design considerations advocated the acquisition of some level of public interest in private lands between the East Lake Panasoffkee property and the nearby Carlton/Half Moon/Gum Slough complex of public lands. The DEP administers the Conservation and Recreation Lands Program (CARL), which serves as the primary land preservation program in the State of Florida, and may be willing to participate in a joint project to link these land areas. The District will remain open to participating in such a project and work with DEP to promote the protection of these intervening lands.

Sumter County

As noted in the discussion of recreational uses, the District is receptive to working with local governments and other outside entities to arrange for cooperative management of recreational use of District-held lands. The East Lake Panasoffkee property is located in rural, unincorporated Sumter County (County) and may serve as an ideal site for establishment of a County-managed park. The District will offer to make the northern portion of the property available to the County for management as a County park, provided that the County's management of public usage would be consistent with this plan.

The Sumter County School Board (Board), on behalf of the County, has expressed an interest in establishing an environmental education program that would take

advantage of the outstanding outdoor classroom provided by the East Lake Panasoffkee property. As noted previously, an existing structure may also be suitable for conversion to an indoor classroom facility or interpretive center in support of the proposed education program. The District is amenable to establishing such a program, provided that an appropriate curriculum is submitted for District review and approval. Funding for the program, including any necessary renovations to the existing structure, must be secured by the Board. The District will work cooperatively with the Board to implement the program and develop a curriculum that incorporates information related to water management and conservation. If the Board declines to commit to the project within several years, or implements a program that will not make use of the existing building, then the District will dedicate the structure to another public use.

The County has advocated the property as a candidate site for the proposed Florida Agricultural Museum. This state-sponsored project is still in the early site-selection phase. The District has agreed to make a portion of the property available for this use, provided that a series of special conditions are satisfied. Construction would be limited to the Special Use Area identified in Figure 7. Refer to page 40 for additional discussion of the proposed Museum.

The County exercises land use authority over all unincorporated lands within the county. As such, the District must work closely with the County to exclude land uses that would be incompatible with the property's status as a regionally-significant natural area and recreational resource.

Future development of surrounding lands must be designed to prevent impacts to the property's natural systems, and the District will coordinate with the County on an as-needed basis to preserve the integrity of the property by preventing incompatible land uses. The District will also ensure that the future management and use of the property do not conflict with County regulations or ordinances and are consistent with the County's Comprehensive Growth Management Plan.

City of Wildwood

The City of Wildwood (City) has requested that a small portion of the East Lake Panasoffkee property be made available for the development of two public supply wells. As discussed in preceding sections of this plan, public supply is considered an appropriate use of District-owned lands, provided that site-specific conditions are appropriate for large-scale withdrawals of water. An analysis of the property's capability to support such withdrawals without sustaining unacceptable environmental impacts will be conducted by the District's water use permitting staff. At present, the City has not submitted all of the information necessary to complete a review of their application for a water use permit. The District will coordinate with the City to determine the site's ability to serve as a water supply source. Any future development of public supply wells on the property will be designed to minimize impacts to the natural environment and to avoid conflicts with other uses of the property.

The City is also an active proponent of the proposal to site the Florida Agricultural Museum on the property. The District will coordinate with the City as necessary to

accommodate the proposed use if the property is chosen by the site-selection committee as the favored site. In order to promote innovative water conservation and alternative source technologies, the District will promote extension of the City's wastewater reuse system to the property for incorporation into the Museum.

Public Input

A public meeting was conducted in the City of Wildwood on November 30, 1995, in order to receive comments and recommendations regarding the future use and management of the property. A previous public meeting, conducted on May 22, 1995, had been held to solicit preliminary guidance from the public prior to development of a draft plan. Comments from the public focused on a variety of issues that included both resource-related and user-related concerns.

The primary concern expressed by the public was related to the potential withdrawal of groundwater from the property in order to satisfy potable water supply needs of the City of Wildwood. The substantial dependence of Lake Panasoffkee upon groundwater and surface water contributions from the property, and the possible sensitivity of on-site and nearby wetlands to local groundwater withdrawals, will require careful analysis of the City's request. Discussion of the property's water supply potential acknowledges these concerns and emphasizes the need for caution and careful evaluation of the request through the District's water use permitting process (refer to pages 7-10 and 40 for additional detail).

An intense interest in recreational use of the property was also expressed consistently at the public meeting. In order to better address this interest, the District will: coordinate with local equestrian groups in the planning and development of new equestrian trails; continue to evaluate the hunting potential of the property so that a compatible sport hunting program can be implemented in a timely fashion; and ensure that any future sport hunting will not unduly constrain use of the property by other recreationists. By the end of calendar year 1996, the District will complete its evaluation of hunting potential and provide for vehicular access from the CR-44 entrance to the equestrian staging area at the polebarn and stall complex. By June, 1997, the District will expand vehicular access to Little Jones Creek and will resolve issues related to creation of a loop trail for equestrian use in the area south of Little Jones Creek.

Interest in the construction of a horse arena, development of off-road bicycling trails, and expansion of motorized access beyond that outlined in the plan was also expressed by the public. The extent and combination of public uses and motorized access currently provided for in the plan represent the District's attempt to balance resource protection needs with the public's right to access; however, the District will remain amenable to considering future requests for public uses that are not expressly prohibited in this plan and that are consistent with the statutory mandate to manage District-held lands in an environmentally acceptable manner.

Reservations related to a proposal to evaluate the property as a reintroduction site for the threatened Florida scrub jay (please refer to pages 49-50 for additional

discussion) were expressed by some members of the public who were concerned that the presence of introduced scrub jays would place unacceptable limitations on recreational use of the property. This concern will be considered as part of the District's evaluation of the proposal; however, the scrub jay is a species that is quite tolerant of human presence and activity and it is not anticipated that their presence would result in limitations on recreational use. Several District-held properties support native populations of scrub jays and public use of these areas has not been impeded by the presence of this species.

A proposal to construct the Florida State Agricultural Museum on a portion of property received strong support from the public. The District has expressed support for this proposed use if the property is chosen from among the slate of nominated sites (see discussion on pages 42-42). In the event that another site is chosen for construction of the museum complex, all references to the proposal will be deleted from this plan.

Internal Coordination

District staff from the Land Resources Department, Planning Department, and Environmental Section of the Resource Projects Department have played key roles in the development of this plan. Its effective implementation will require continuing cooperation among these and other departments of the District.

Responsibility for the review of water use permit applications rests with the Resource Regulation Department, and close coordination with this department will be maintained during review of the City of

Wildwood's proposal to site two potable water supply wells on the property. Assistance from the Office of the General Counsel may also be required to implement certain aspects of the plan, including a strategy for the management of boat traffic on Little Jones Creek.

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