Land Use and Management Plan

Flying Eagle Preserve

August 2011

Southwest Florida
Water Management District

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Introduction

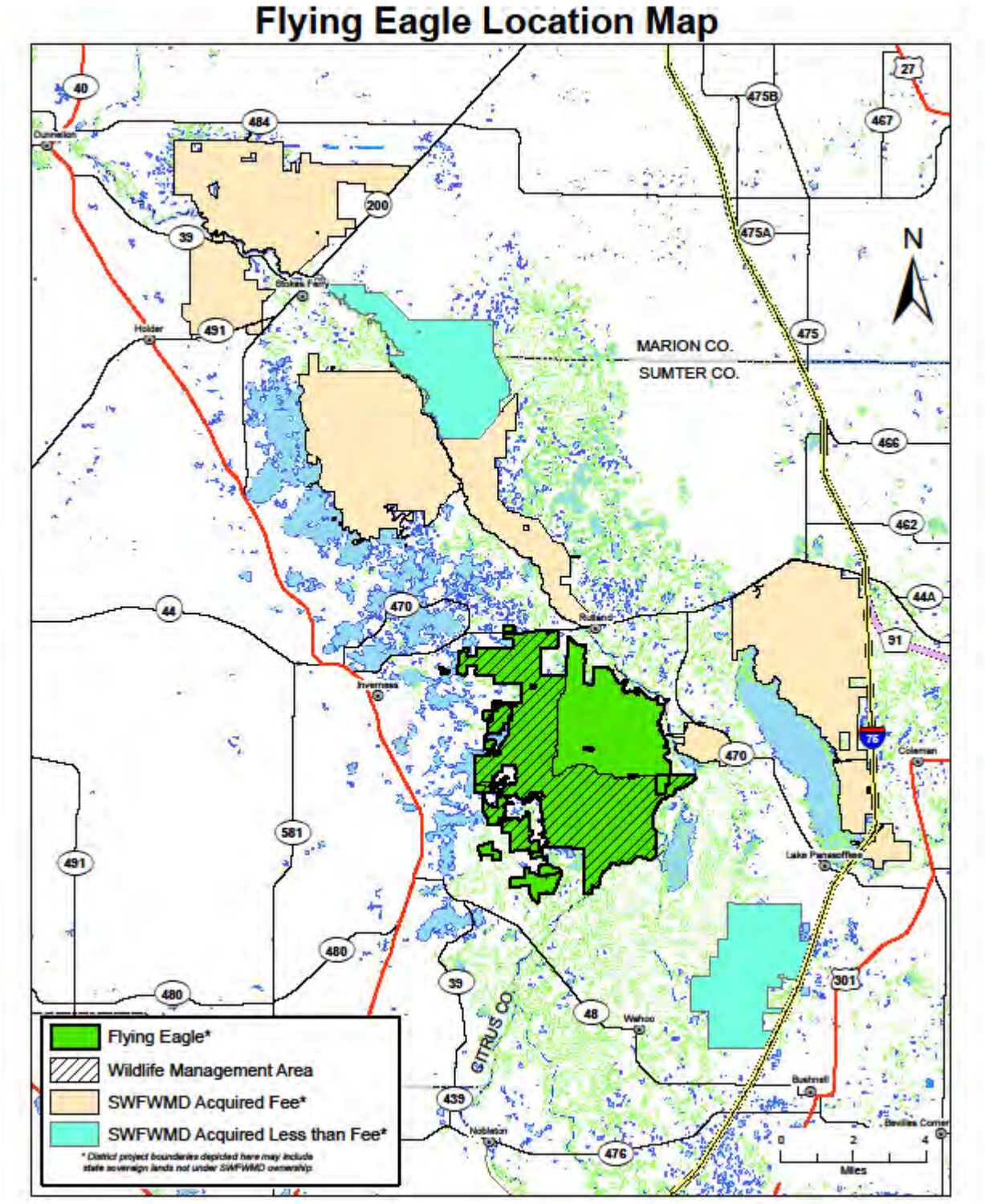
The Flying Eagle Preserve is located in west-central Citrus County (Figure 1) within the Withlacoochee River watershed. Acquisition of lands within the Preserve began in 1986. It is part of a contiguous 122,000-acre core of protected public conservation/recreation lands and was primarily acquired to protect, restore and maintain the quality and natural functions of land, water and wetland systems of the state; for natural flood control and water detention; and to increase natural resource-based public recreational opportunities. The total acreage represented in the Flying Eagle Preserve Land Use and Management Plan is 16,334 acres, which includes a mosaic of lands owned and managed by the Southwest Florida Water Management District and lands held in trust by the State of Florida under the designation of sovereign submerged lands.

Flying Eagle Preserve includes 9.5 miles of frontage along the Withlacoochee River, which is designated by the Florida Department of Environmental Protection as an Outstanding Florida Water. The Preserve is comprised of 5,701 acres of mesic hammock and other forested uplands with 561 acres of pasture and other lands covering the remainder of the uplands. The remainder of the Preserve and interwoven state lands consists of basin marsh, swamp and other wetland communities. Important natural resources and their ecological significance are summarized in the Water and Natural Resource Data Section of this plan.

The Preserve has a rich historic and prehistoric past. Early accounts from the Seminole Wars indicate that the elevated hammocks along the Withlacoochee River and along the east and west sides of the Tsala Apopka Lake system served as settlement locales for the Seminole Indians and earlier native populations and as sites for their fields. Several archeological sites scattered throughout the Preserve have been identified, are preserved under the guidelines of the state's Division of Historical Resources and are further protected by the District's ownership. Historical uses of the Preserve include cattle grazing, turpentining, logging and hunting. Since the 1970s, a portion of the Preserve has also been used as a youth education and recreation center operated by the Boy Scouts of America. Today, there are a variety of recreational opportunities compatible with the natural communities present at the Preserve including bicycling, birding, backpacking, equestrian riding, hiking, hunting, geocaching, interpretive uses, nature study and photography. The existing youth center offers additional recreational opportunities such as archery/rifle target shooting, a rappelling tower and use of several improvements on site.

The mission of the Southwest Florida Water Management District is to manage water and related natural resources to ensure their continued availability while maximizing environmental, economic and recreational benefits. Central to this mission is protecting and maintaining water and related natural resources that provide the District's 16-county region with its existing and future water supply and maintaining the balance between the land use needs and current and future demand for these resources. This mission emphasizes four Areas of Responsibility (AORs): water supply, flood protection, water quality and natural systems protection. The District's land acquisition and management program supports and furthers the resource protection and management efforts under each of these AORs.

Figure 1


Flying Eagle Location Map
MARION CO.
SUMTER CO.
CITRUS CO.
N
Flying Eagle*
Wildlife Management Area
SWFWMD Acquired Fee*
SWFWMD Acquired Less than Fee*
* District project boundaries depicted here may include state sovereign lands not under SWFWMD ownership
Miles
0
2
4

Water and Natural Resource Data

Natural resource conservation and preservation was the primary purpose for acquisition of the Flying Eagle Preserve; water resource benefits derived from the Preserve were achieved through acquisition. Land Stewardship practices will seek to maintain, enhance and protect these functions. Water resource functions important on the Preserve and interwoven state lands are as follows:

Water Quality

As part of a number of large, publically owned tracts within the Withlacoochee River/Lake Tsala Apopka region, Flying Eagle Preserve is comprised of natural uplands and extensive freshwater systems, including emergent freshwater marshes, sloughs, and rivereine floodplain, along nearly 9.5-miles of the Withlacoochee River.

Lake Tsala Apopka is the largest freshwater resource in Citrus County. The system is comprised of an interconnected series of vast marshes and open water pools covering nearly 22,000 acres. The lake system is divided into three separate and hydrologically distinct "pools." These pools are connected with the Withlacoochee River through a vast expanse of marsh lying between the pools and the Withlacoochee River. Both the Withlacoochee River and Lake Tsala Apopka have been designated as Outstanding Florida Waters (OFW) by the Florida Department of Environmental Protection (FDEP). An OFW designation is assigned to those waters deemed worthy of special protection because of their natural attributes and is intended to protect existing good water quality. The FDEP cannot issue permits for direct pollutant discharges to OFWs, which would lower existing water quality, or for indirect discharges which would significantly degrade the Outstanding Florida Water.

Prior to structural modifications to the Lake Tsala Apopka Chain, surface water flows between the Withlacoochee River and Lake Tsala Apopka occurred through the marsh complex. This natural exchange served to improve water quality by allowing plants to remove nutrients. In addition to modifications to the Lake Tsala Apopka Chain, past land use practices altered the drainage patterns of the largest internal marsh in Flying Eagle Preserve known as Grand Prairie. This system was restored in December 2008 by installing a series of ditch plugs in Shinn Ditch, a 2.4 mile-long channel cut through Grand Prairie that drained the marsh. In addition to the installation of plugs, culverts along the east-west berm road were modified to allow surface water exchange through the marshes as had occurred historically. The result was the ability for the Grand Prairie marsh complex to store and treat surface water and improve water quality. Further restoration (reconnecting historic hydrologic connections along existing berms where feasible) and continued maintenance (prescribed fire application) of the marshes in the Preserve will contribute to the overall health of the Withlacoochee River and Lake Tsala Apopka.

Water quality of the marshes is good, based on data collected by the District for specific restoration and construction projects. Additionally, other indicators including desirable emergent vegetation and healthy invertebrate and fish populations suggest that water quality is good. Although the District collects only limited long-term water quality data on the marshes, it does, however, conduct frequent water quality sampling and analysis of the Withlacoochee River and 21 named lakes in the Tsala Apopka Chain. Overall, water quality is ranked good and is directly attributable to the natural landscape, including the health and condition of wetlands within the Flying Eagle Preserve. Future restoration projects, including the reconnection of historic conveyance pathways, will serve to further improve water quality.

Water Supply

There are multiple users of groundwater surrounding the Flying Eagle Preserve property. The permitted annual average water use quantities adjacent to the Preserve (generally between U.S. Highway 41 and the Withlacoochee River) consist of approximately 630,000 gallons per day (gpd) for agriculture, 280,000 gpd for recreation/aesthetic, and 180,000 for public supply. The Upper Floridan aquifer is generally unconfined in the Preserve, and potentiometric levels fluctuate similar to the lake stage in the Floral City Pool of the Tsala Apopka system. Water levels in the Floral City Pool are managed by a network of water control structures; however water levels are strongly influenced by high recharge rates in the vicinity and climatic conditions. Future water supply use at or near Flying Eagle Preserve should be permitted with respect to the Minimum Lake Levels established for the Tsala Apopka chain of lakes. The historical agricultural land alterations which diverted overflows from the Withlacoochee River to the marshes and wet prairies within Flying Eagle Preserve impacted the level of recharge to the Upper Floridan aquifer. The District's Shinn Ditch hydrologic restoration project, completed in December 2008, has restored natural conveyance into the Preserve's wetlands. This project is expected to result in enhanced infiltration into the Upper Floridan aquifer and an increase in groundwater resources available to local users.

The Flying Eagle Preserve is surrounded by the public supply utility service areas of Citrus County Utilities, the City of Inverness, the Floral City Water Association, Oak Pond Utilities, and the Lake Panasoffkee Water. Both Citrus County and the City of Inverness are members of the Withlacoochee Regional Water Supply Authority (WRWSA), which is the entity responsible for evaluating regional potable water demand and coordinating source development. Potential regional wellfield locations considered by the WRWSA have been evaluated based in part by the distance from sensitive wetlands that might be impacted by large withdrawals (7,500,000 gpd or greater). By this criterion, the Flying Eagle Preserve was not considered a suitable location for a regional supply wellfield.

The WRWSA has evaluated a regional surface water supply facility location on the Withlacoochee River between the Wysong Control Structure and the Lake Panasoffkee Outlet River tributary. The surface water withdrawals would be used conjunctively with other sources and would occur based on the seasonal availability of supply. The WRWSA considered state property across the Withlacoochee River from the Flying Eagle Preserve for the proposed withdrawal structure and water treatment plant location. There is a potential for land within the Flying Eagle Preserve to be a secondary location for infrastructure and transmission systems if the regional supply were to be delivered to utilities west of the Preserve. The WRWSA anticipates a need to develop this facility or another alternative water source within the next 50 years to meet future water supply demands in the region.

Recharge

The Floridan aquifer is recharged to some degree in all parts of the basin except at or near the Withlacoochee River and springs. Flying Eagle is located in an area of moderate recharge, the rate of which is limited primarily by the close proximity of the potentiometric surface of the Floridan aquifer to the top of the aquifer (Anderson and Laughlin 1982).

Flood Attenuation

The Flying Eagle Preserve is uniquely located between the Withlacoochee River and the Tsala Apopka Chain-of-Lakes. It includes a series of interconnected wetlands that provide significant flood attenuation to the region. These wetlands were a historic connection between the river and lakes during periods of high water. Construction of open channels, berms, and structures within the region has subsequently altered this historic connection, allowing the river to flow into the lakes sooner and to be held there for longer periods of time. For example, the north/south dike road in Flying Eagle serves to conserve water in the lake system during low water periods while providing flood protection from the river, up to approximately a ten-year event, above which the road overtops. A series of culverts were installed in the road in 2007 as part of a hydrologic restoration project to allow water to flow into the lake system, when conditions allow, without causing flooding. With the tract now under public ownership for conservation purposes, development of the property is prohibited which would otherwise be a source of further flood attenuation challenges.

Unique Management Issues

Flying Eagle Youth Center

In December of 2004 the District acquired the 4,952 acres, McGregor-Smith Boy Scout Reservation, from the South Florida Council of the Boy Scouts of America. Under its ownership of the tract, the South Florida Council developed and managed the Reservation as a regional scouting facility. In October 2005, the District issued a request for proposals for a qualified entity to operate and maintain the facilities as a youth-oriented activity center with programs emphasizing outdoor activities and environmental education. The Gulf Ridge Council of the Boy Scouts of America, based in Tampa, was selected to operate the youth center; accordingly, the District and the Gulf Ridge Council entered into a ten-year lease agreement beginning in 2006.

The Youth Center is comprised of 22 buildings and various activity sites, including a shop complex, ranger residence, lodge, guesthouse, six cabins, administration building, kitchen, tent campsites and target ranges. These facilities are clustered within 580 acres of the Reservation depicted in Figure 2. The Gulf Ridge Council is responsible for all aspects of the youth camp's operation while the District manages the natural resources within the 580-acre lease area.

Many of the facilities within the youth camp are dated and in need of costly maintenance. The District and the Gulf Ridge Council are considering strategies to reduce the Council's costs of maintaining the facilities. Potential strategies include demolishing some of the older, infrequently used facilities and seeking additional partners with the District and the Council in the management of the youth center. Youth activities and education will continue to be the primary objective of any partnership involving the youth center.

Wildlife Management Area (WMA)

The District is under partnership with the FWC for the management of hunting activities on the majority of the Preserve's lands not including the Boy Scout tract. The Agreement has a one-year term and renews automatically each year subject to suspension and termination provisions in the Agreement. Areas approved for hunting activities are identified in the Land Use Matrix in this Plan. At the request of FWC, the WMA boundary was reviewed and slight modifications were made in April 2010. The boundary of the current WMA is depicted in Figure 2. The depiction does not differentiate sovereign and non-sovereign lands. Sovereign submerged lands are not subject to the WMA partnership agreement.

Sovereign Submerged Lands

Florida's sovereign submerged lands are those public trust lands below navigable water that the United States Congress transferred to the state of Florida in 1845 as Florida was granted statehood. "Lands below navigable water" means all lands which are covered by non-tidal waters that are navigable under the laws of the United States. Sovereign submerged lands are held in trust by the Florida Board of the Trustees of the Internal Improvement Trust Fund for the use and benefit of the citizens of the state, as set forth in the state constitution. The Florida Department of Environmental Protection (DEP) is responsible for delineating the boundaries of, and managing sovereign submerged lands.

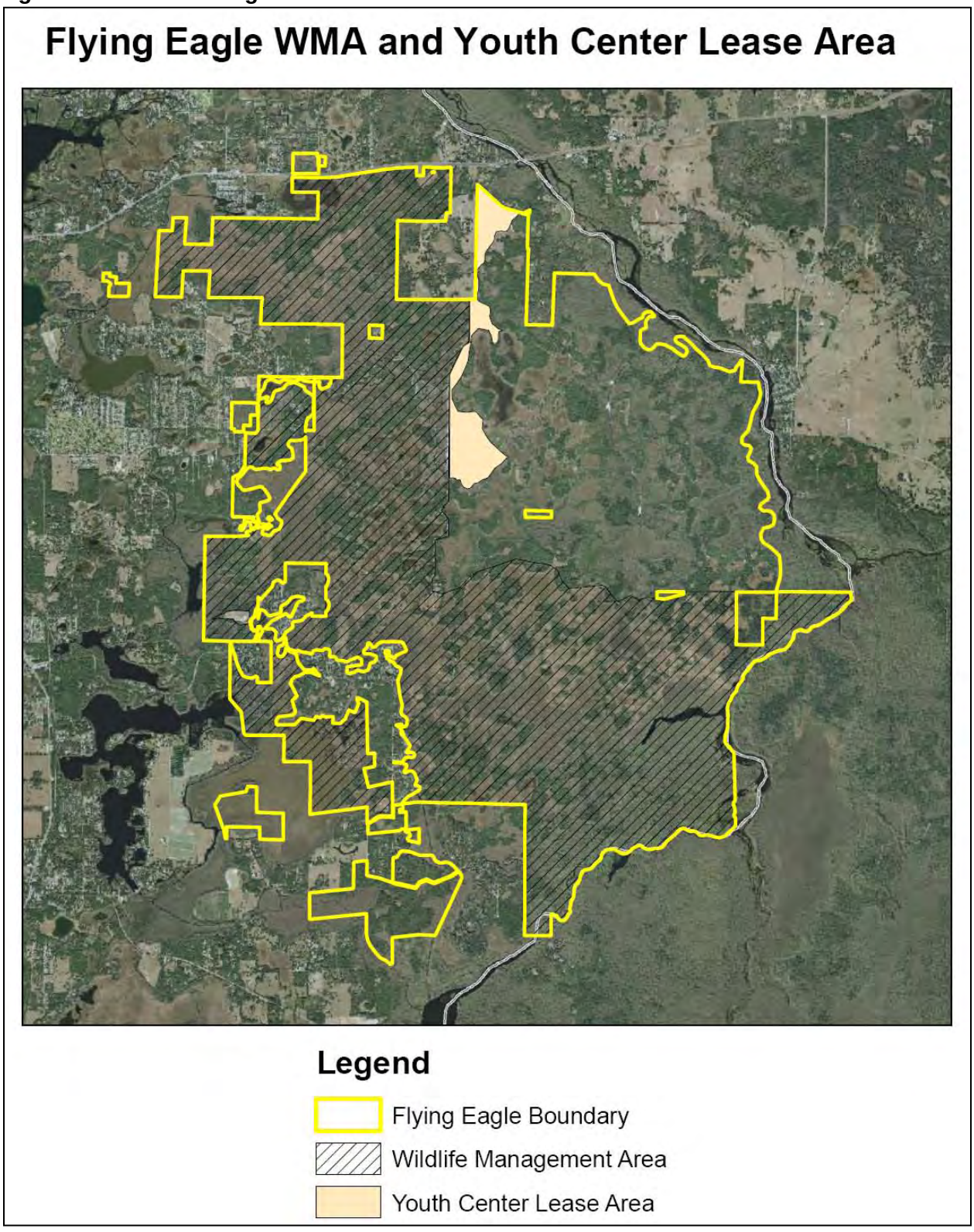
The boundary between sovereign submerged lands and District-owned lands on the majority of the Flying Eagle Preserve has not been delineated by the DEP. However, a boundary survey of the 4,952-acre Boy Scout tract, endorsed by DEP, was completed during acquisition and represents that the tract does not contain any sovereign submerged lands. The remainder of the Preserve is interconnected with sovereign lands. While the District is only responsible for resource management of all non-sovereign lands on the Preserve, fire management can be more effective if sovereign and non-sovereign lands are included in a particular burn unit or burn plan. DEP continues its endorsement of the District's prescribed fire activities in sovereign lands and the agencies coordinate closely to ensure no interference with the rights of other entities or individuals with respect to the use of these lands.

Natural Systems

Of the 82 natural communities defined by the Florida Natural Areas Inventory (FNAI), 15 occur on Flying Eagle and the interconnected sovereign submerged lands. The unique mosaic of community types is comprised of vast wetland acres and 7,172 upland acres. Of these, scrub is considered globally imperiled and two (sandhill and wet prairie) are imperiled in Florida. Four others are considered rare: basin swamp, scrubby flatwoods, xeric hammock and blackwater stream. Primary surface water features include approximately 9.5 miles of floodplain along the southern bank of the Withlacoochee River. Expansive state-owned wetlands intertwined throughout the Preserve form the bulk of the internal drainage system and provide extensive surface water storage and flood protection benefits. Wet prairie is a prominent feature of the expansive area known as Grand Prairie located on the McGregor-Smith addition. Upland communities are dominated by mesic hammock, xeric hammock, scrub and altered lands. The current natural and altered communities and the total acreage for each are shown in Figure 3. The depiction and acreage figures do not differentiate between District-owned and sovereign lands.

Wetlands, most of which are sovereign submerged lands, are distributed throughout the Preserve's general area and are often interconnected during high water periods. Isolated depression marshes are broadly distributed as well. The vegetation in these communities is typically grasses and other herbaceous plants but woody species such as wax myrtle, buttonbush and Carolina willow may proliferate in marshes with shortened hydroperiods or altered fire regimes. Their condition is highly variable, but appears overall to be good to fair. Historic impacts resulted primarily from altered water levels, interruption of the natural fire regime and cattle grazing, which contributed to shifts in community structure and species composition.

Figure 2. Wildlife Management Area and Youth Center Lease Area



At 4,481 acres, mesic hammock accounts for most of the Preserve's uplands. Structure and species composition is highly variable, primarily due to flooding, soils, fire history and historic land uses. Most of the characteristic live oak canopy was logged and the understory of some hammocks was cleared for cattle. However, scattered large trees remain in some areas and there are many high quality examples of this community on the property. Prescribed fire has been applied to some areas to reintroduce this important disturbance. Mesic flatwoods occupy only 62 acres and were never prominent on the Preserve. Current stands are degraded due to cattle grazing and altered fire regimes that have eliminated much of the grass component of the groundcover.

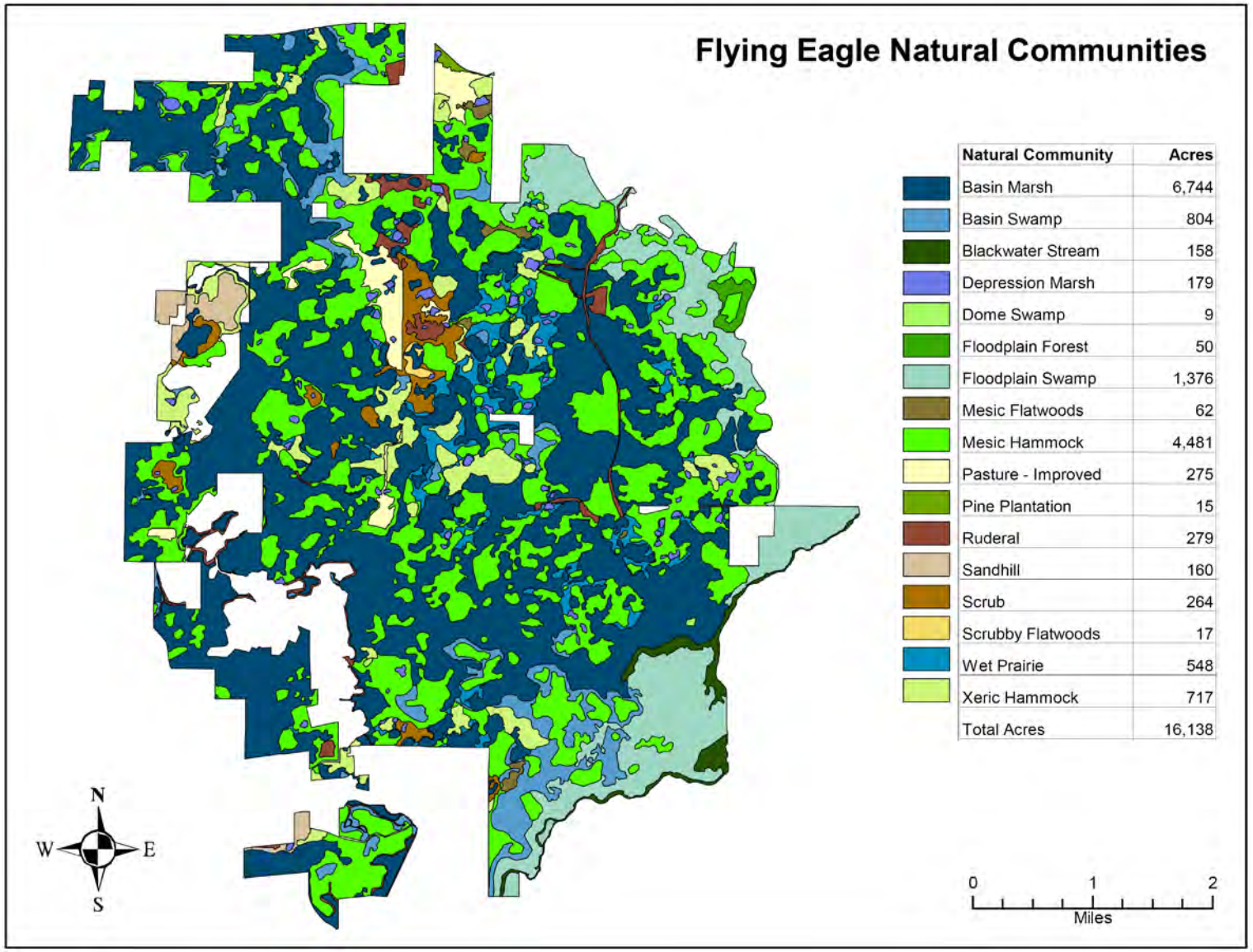
Floodplain swamp and basin swamp account for nearly all of the forested wetlands occurring on the Preserve and intertwined State lands. Floodplain swamp is restricted to frequently flooded areas along the river and the canopy is comprised of buttressed, hydrophytic trees such as bald cypress and tupelo. The groundcover, if present, is sparse due to frequent inundation. Basin swamps are limited in extent and usually occur as depressions within hydric hammock. They tend to have a mixed canopy of pond or bald cypress, oaks, American elm, red maple and occasional slash or loblolly pine. The understory is more diverse than that of floodplain swamp and typically contains various woody shrubs, ferns and vines. Floodplain forests occupy slightly higher, drier spots in the floodplain and typically have a canopy of live oak, laurel oak, water hickory and swamp chestnut oak. The understory is usually open, herbaceous, and often supports a diversity of plants. Totaling only nine acres, dome swamps are very restricted and occur in three widely distributed locations on the Preserve. Overall, these communities are in good condition. However, formerly drained swamps, impacted by shortened hydroperiods and damage from feral hog rooting, is an increasing threat. A list of rare and unique plants found on Flying Eagle Preserve is shown in Appendix 3.

Natural Communities

The natural communities on Flying Eagle Preserve are described below:

Xeric uplands (1,158 acres) were more extensive before land conversion created improved pasture. Xeric hammocks on the property are primarily the result of long-term fire suppression of scrub, scrubby flatwoods and sandhill. Without fire, these communities become dominated by a dense canopy of sand live oak and other species that shade out most of the characteristic vegetation and eliminate open sand patches. Naturally occurring xeric hammocks are found in a few locations and developed on well-drained soils embedded within mesic hammock or other areas sheltered from fire. Most of the scrub is located on the McGregor-Smith addition. This area supported Florida scrub-jays until approximately 1990 and restoration may reestablish this species on the Preserve. Longleaf pine-turkey oak sandhill is restricted to a small area of the property known as Lake Estates that was formerly platted as part of an area subdivision. This area is notable as it preserves a portion of the historic connection of the Tsala Apopka Plain to the Brooksville Ridge. The sandhill is degraded due to former logging practices, fire exclusion and road clearing. Restoration activities have focused on reducing hardwoods to augment prescribed fire application and to further recovery of the groundcover. This area supports populations of several state-listed plants including trailing spiny-pod, sand butterfly pea and garberia. Scrubby flatwoods are very limited in extent and are highly degraded due to fire exclusion and intensive logging of the pines.

Figure 3. FNAI Natural Communities



The majority of the Preserve's disturbed areas (561 acres) are the result of land conversion to agricultural uses in two primary areas that were historically made up of a mosaic of communities dominated by mesic and xeric uplands. Much of this land was cleared for pasture or row crops. Areas only partially cleared retain components of the natural community allowing for passive restoration in some areas. Conservation of these lands is an important component of the long-term management of the Preserve due to their size, species habitat, restoration potential and their critical role in managing adjacent communities, particularly with regard to fire. Two former groves, known as Smoak Grove and Burned Out Grove, were used in the past by Citrus County for disposal of spoil dredged to maintain area canals. Today, Smoak Grove is the site of the Withlapopka Community Park and Burned Out Grove is utilized for an apiary lease.

Wet flatlands within the limits of the Preserve (548 acres) are comprised entirely by wet prairie, a treeless community characterized by a groundcover of grasses, herbaceous plants and shrubs maintained by a combination of hydrology and frequent fire. The average hydroperiod for wet prairie lies between that of basin marsh and wet flatwoods. The groundcover of wet prairie at Flying Eagle is primarily maidencaine. Other prominent grasses include sand cordgrass, muhly grass, witchgrass, carpetgrass and wiregrass. The herbaceous component of wet prairie is notably diverse and at Flying Eagle commonly includes hatpins, sundews, butterworts, milkworts, lobelia, yellow-eyed grass, lemon bacopa, meadow beauty and St. John's wort.

Blackwater streams (158 acres) within the limits of the Preserve. They are characterized as perennial or intermittent seasonal watercourses originating deep in sandy lowlands where extensive wetlands with organic soils function as reservoirs, collecting rainfall and slowly discharging it to the stream. Blackwater streams have sandy bottoms overlain by organics and are frequently underlain by limestone. The Withlacoochee River is a large example of a blackwater stream and forms the entire eastern boundary of Flying Eagle.

Exotic Species

Invasive plant species found on the Preserve include Chinese tallow, skunk vine, cogon grass, green wandering jew, lantana, sword fern, Japanese climbing fern, asparagus fern, mimosa, natal grass, water hyacinth, water lettuce, wild taro, air potato and torpedo grass. Most of these species are at a maintenance level of control requiring periodic monitoring and retreatment. Species such as Chinese tallow, cogon grass and skunk vine require more intensive management due to their high propensity to spread, infest remote areas and frequent need of retreatment.

Feral hogs are the primary exotic animal occurring on the property and are considered an increasing threat to Florida's natural areas because of the damage caused by their rooting and as carriers of diseases that can be spread to both humans and wildlife. In an effort to reduce the population, a District-wide trapping program began in 2005 and was followed in 2008 by special public hunts on its lands not designated as Wildlife Management Area

Species

The Florida Fish and Wildlife Conservation Commission (FWC) designated the Tsala Apopka region as a Strategic Habitat Conservation Area for limpkin and wading birds including white ibis, wood stork, tricolored heron, little blue heron, snowy egret and great egret (Cox et al. 1994). Other rare animals known to occur or have been previously reported at Flying Eagle include whooping crane (nonmigratory Florida population), American bald eagle, American alligator, Sherman's fox squirrel, Florida black bear, swallowtail kite, Florida sandhill crane, gopher tortoise, gopher frog, eastern indigo snake and eastern diamondback rattlesnake. Though no longer found on the property, it is notable that Florida scrub-jays occupied habitat

on the McGregor-Smith addition until approximately 1990. Numerous rare plants also occur, particularly in areas of mature, high quality hammock.

The Florida Atlas of Breeding Sites for Herons and their Allies: 1986-1989 Update documents two historic rookeries on the property and eight within ten miles of the Preserve. Although substantial rookery activity has not occurred in recent years, wood storks and other wading birds frequently use the marshes for foraging when conditions are suitable.

Gopher tortoises are abundant on the Preserve and provide important habitat to a variety of commensal species. Formerly a Species of Special Concern, the gopher tortoise is now listed as threatened in Florida primarily due to continuing habitat loss and disease. New management goals and objectives for recovery of the species were adopted in September 2007 in FWC's Gopher Tortoise Management Plan. District staff will continue its coordination with the FWC regarding the new guidelines as well as its ongoing monitoring program on the Preserve.

Accounts from residents suggest that Florida scrub-jays occurred on the Flying Eagle McGregor-Smith addition until approximately 1990. Habitat surveys conducted by District staff following acquisition identified a core area totaling approximately 332 acres that could have supported as many as five scrub-jay groups. Additional surveys were conducted to detect scrub-jays without success and it was determined that no habitat was occupied and that only a small percentage was suitable for the species at that time. Florida scrub-jay populations on public and private lands occur within dispersal distance of Flying Eagle. It is anticipated that future immigration will occur once restored habitat has matured to a stage capable of once again supporting the species.

Restoration

Hydrologic restoration has included the installation of culverts and ditch blocks at strategic locations to re-establish original drainage patterns and wetland hydroperiods. The most recent and extensive project restored a large area of wetlands associated with Shinn Ditch and is described in detail below.

Upland restoration projects began in 1991 to enhance and restore approximately 178 acres of wildlife habitat in an area known as Whitelaw Field and a large pasture to the north of that location. Recent projects have restored approximately 581 acres of scrub, sandhill, wet prairie and ruderal areas via mechanical and herbicide treatment on sites located on the McGregor-Smith addition and on the west side of the Preserve.

Grand Prairie Restoration – In December, 2004, the District purchased the McGregor-Smith Boy Scout Reservation tract as part of the Flying Eagle Preserve to complement the original tract for natural systems protection and resource conservation. The McGregor-Smith tract encompasses 4,952 acres in the northeast quadrant of Flying Eagle.

Shinn Ditch was a man-made alteration that bisected the length of the tract from south to north. The ditch was 2.6 miles in length and has an average width of 32 feet. The ditch was constructed in the 1950s to dewater several herbaceous wetlands to facilitate cattle grazing by a previous landowner. The hydrologic alteration effectively shunted flows directly to the Withlacoochee River from the area known as Grand Prairie, a large expanse of freshwater marsh in the central portion of the McGregor-Smith Boy Scout Reservation tract. Impacts to the Grand Prairie marshes included a significant reduction in hydroperiod and the increase of woody vegetation encroachment.

The restoration project focused on two goals: (1) recovering the functions of water storage and conveyance in impacted wetlands; and (2) recapturing the benefits of water quality and wildlife habitat formerly provided by the impacted system in its undisturbed state. The District's Operations Department provided the construction necessary to complete the project. Four ditch blocks were installed at subbasin breaks to rehydrate Grand Prairie and associated marshes. Additionally, four culvert modifications were made along the east-west berm road to restore historic flows to the marshes south of the tract. The result was the hydrologic restoration of more than 1,700 acres of wetlands and the elimination of dewatering the Dead River Flats Area.

Planning Process

Governing Board Policy 610-3 requires that District conservation lands be managed for water supply, natural systems, public access, recreation and education, biodiversity, archaeological resources and forestland. Governing Board Procedure 61-3 provides the framework to implement Policy 610-3 and to evaluate appropriate land management activities and recreation opportunities on District lands. The process includes the following steps:

- Review the previously adopted management plan
- Verify water and natural resource data
- Delineate management zones
- Review regional recreational supply and demand
- Complete land use matrix
- Obtain public input

The first steps taken for the development of this plan were the review of the previously adopted management plan (1988) and verification of the Flying Eagle Preserve's water and natural resource data. Specific data about the Preserve's water resources, natural habitat and species are summarized in the Water and Natural Resource Data Section of this plan.

Land Use and Management Zone Map

The natural resource data and information contained in the previous management plan were evaluated to create a Land Use and Management Zone Map. Science-based preserve design and management principles were applied to the Preserve to delineate management zones as shown in Figure 4. The six management zones contained in District Policy 610-3 that were considered during the zoning process are shown in Appendix 1 and describe the purpose for which that zone would be assigned. Land Use and Management Zones group the Preserve into geographic units sharing similar natural traits, protection requirements, use potential and management needs and are used to organize management activities and to locate compatible land uses within appropriate areas of the Preserve.

The Preservation layer was applied first as it is the key management objective for the Preserve. Special Protection Areas were applied next to provide adequate protection to important and sensitive features of the Preserve. Each remaining zone was applied, if applicable, based on the Preserve's resource conditions and user experiences on the property. The final zones assigned to the Preserve are listed below:

- **Preservation** – Zone established for the protection of non-sovereign high quality wetlands, including basin swamps, marshes and wet prairie communities and sensitive and/or rare upland communities including sandhills and the pine flatwoods matrix.

- **Special Protection Areas** – Zones established in the area under conservation easement for the Grand Prairie restoration project and for the established gopher tortoise-recipient site located in the western portion of the property.
- **Resource Management** – Much of Flying Eagle Preserve was altered prior to the District's ownership to support historical uses, most notably, cattle grazing. Resources are currently managed in a manner that allows for historic vegetative habitat conditions to recover naturally. Although many of the wetlands have been hydrologically impacted, the majority of the natural communities remain functionally intact. Recent and projected land uses on the property are not consumptive in nature. This plan does not recommend any sustainable resource utilization.
- **Recreation** – Zones established include public access points, campgrounds, recreation trails and areas suitable for development of recreational activities.
- **Transportation** – Zone established at primary access points and where vehicular access may be permitted for general traffic associated with the youth camp and for authorized hunting activities. All transportation zones are considered recreation trails as well.
- **Special Use** – The main area within the youth camp is a high activity use area and has been designated as a Special Use Zone. A portion of the property adjacent to the main entrance to the youth camp at the north portion of the property has also been designated as Special Use. The altered condition of this area, along with its proximity to a main entrance, offers opportunities for future uses not necessarily compatible with the resource protection objectives for which Flying Eagle was acquired. The area known as Withlapopka Park, while a popular recreation area, has been designated as Special Use; Citrus County reserves the right to utilize the area for spoil disposal.

The final zone map with the above described zones is shown in Figure 4. The depiction does not differentiate sovereign and non-sovereign lands, as a clear delineation has not been made. Sovereign submerged lands do not fall under any zoning classification related to this section of the plan.

Review of Regional Recreation Supply and Demand

Before the land use and management zone map was finalized, a regional recreation assessment was conducted to identify nearby recreational opportunities offered by other recreation providers including state and local government. A 20-mile radius was established around the Preserve to determine the segment and size of the population likely to use the Preserve. The resource-dependant recreation opportunities within the 20-mile radius available to that segment of population were also identified. The assessment was primarily conducted to identify the unmet demand for resource-dependant recreation activities near the Preserve that may be considered at the Preserve if compatible with resource management objectives. The radius established around the Preserve is shown in Figure 5.

Table 1 contains a list of resource-dependant recreation opportunities that are available to the public within a 20-mile radius of Flying Eagle. The 20-mile radius was used in order to include significant population densities that may utilize the property as well as identify other recreation areas within a reasonable distance of those population densities. As the table indicates, there are approximately 176,490 acres of public lands that have quality resource-dependant recreation opportunities that include hiking, biking, equestrian riding, camping, fishing, hunting and nature appreciation. There are thirteen significantly large properties listed on the table that offer diverse opportunities and ample trail network to accommodate many resource-dependant recreation opportunities. The primary providers of these opportunities include state and local governments, and the District. The District is the full or partial owner of 57,872 acres of the

176,490 listed in the table and contributes significantly to providing opportunities for resource-dependant recreation in this area and throughout the region. The larger sized properties listed on Table 1 may provide additional opportunities over time when demands increase.

Land Use Matrix

The land use and management zones specifically established for the Preserve were incorporated into a matrix that contains a broad range of resource-dependant recreation activities and renewable resource land uses as shown in Appendix 2. Any compatible resource-dependant opportunities in demand that were identified under the regional evaluation are also added to the matrix. Consistent with preservation objectives, only those resource-based recreation activities that require minimal amenities and can still have a quality recreation experience were considered compatible. Only those activities considered compatible with the zoning designations established for the Preserve were selected and are depicted on the Preserve's final matrix shown in Table 2. As a result, the recreational experience offered at the Preserve will be geared toward passive resource-based uses.

Public Input

A draft zone map and matrix, along with natural resource data for the Preserve, were presented to the public for input and comment at a public meeting noticed through various news publications, the District's web site and through the District's Land Use Stakeholders/Basin Board Land Resources Committee. Public input received at the workshop was minimal and did not constitute a need to revise the plan.

Figure 4. Flying Eagle Recreation and Zone Map

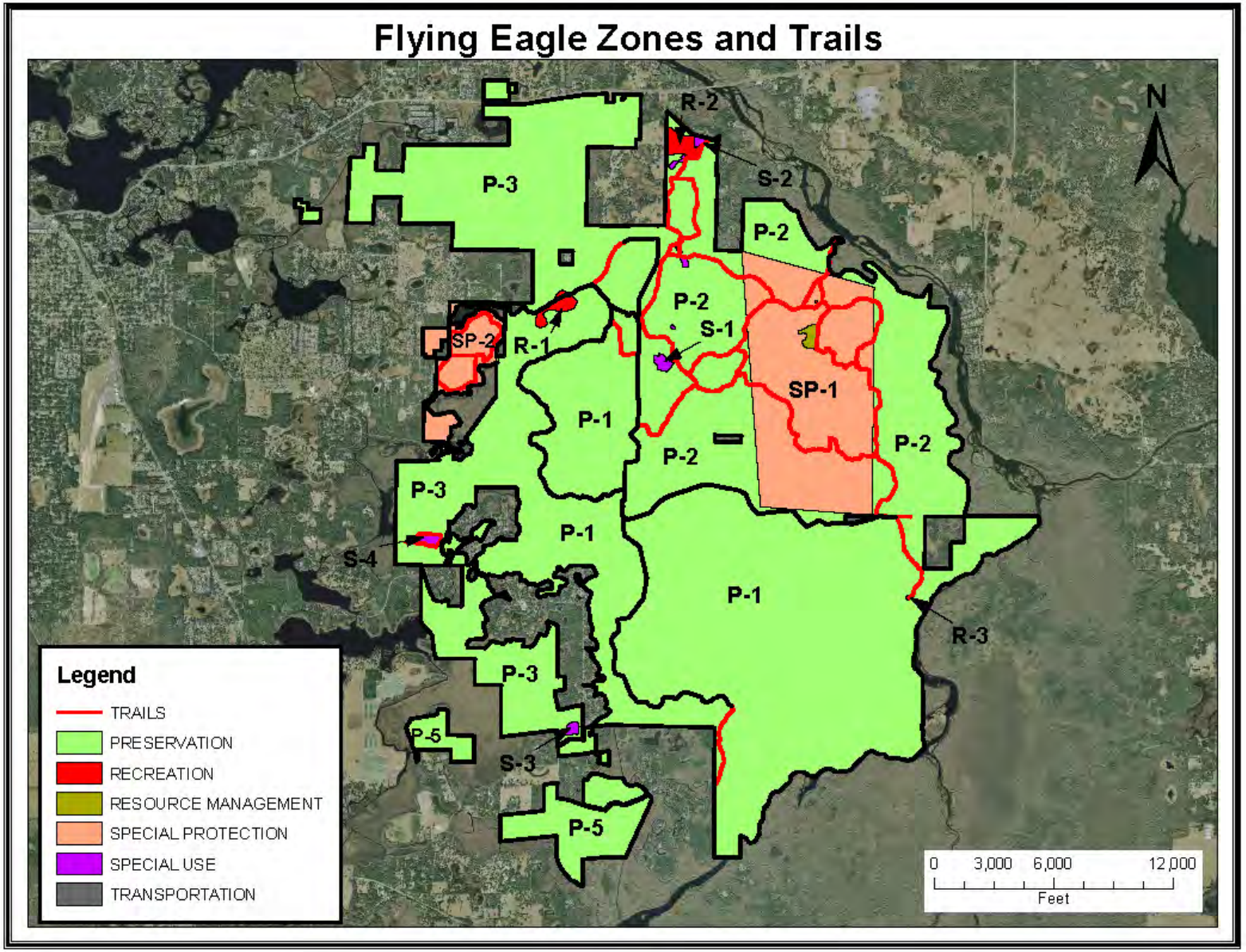


Figure 5. Regional Recreation Assessment for Flying Eagle

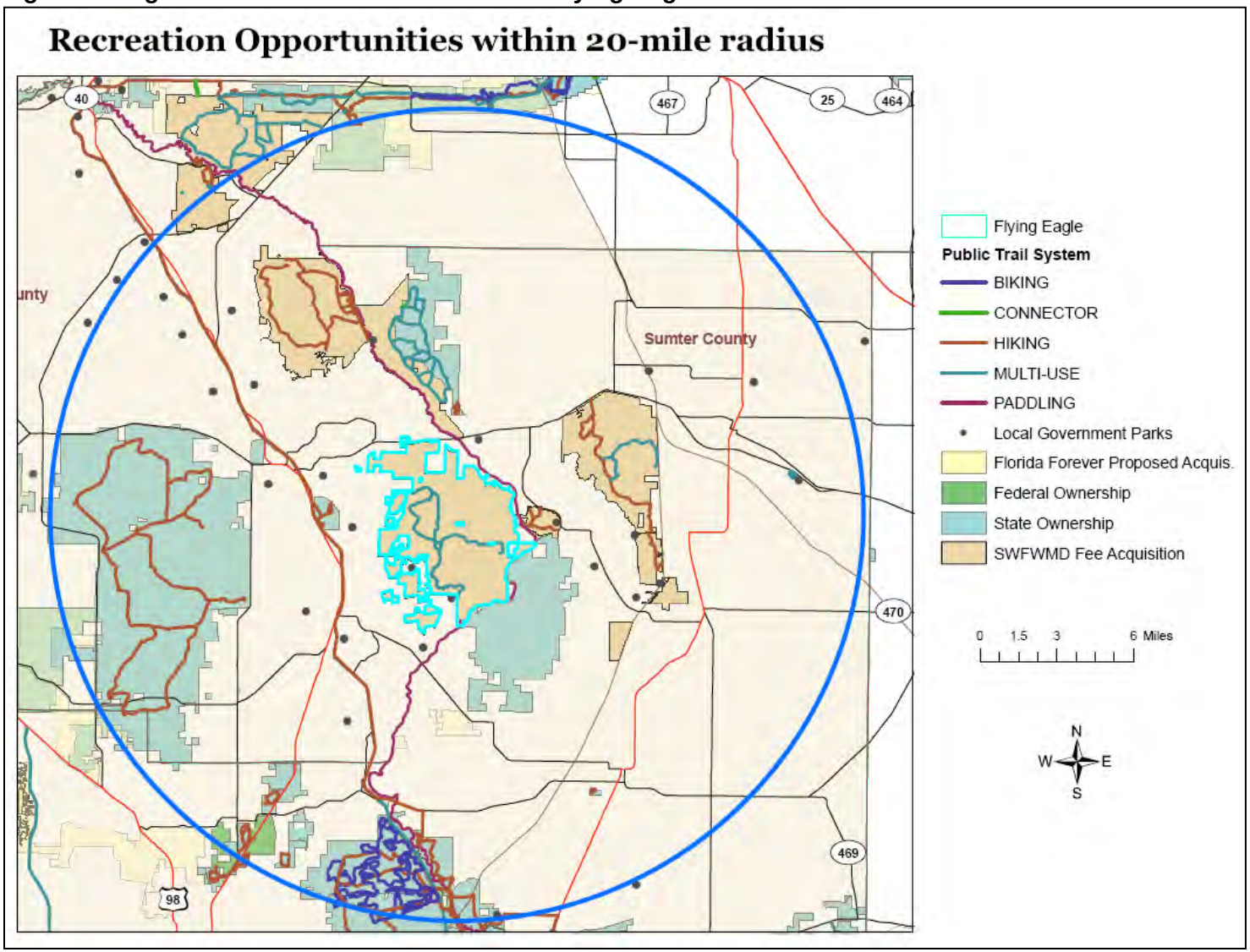


Table 1. Regional and Local Resource-Based Opportunities

Name	Owner	County	Acreage	Hike	Bike	Horse	Camp	Nature	Bird	Picnic	Fishing	Hunt	Paved Trails	ADA Access	Env. Education	Rest-rooms
Halpata Tastanaki Preserve	SWFWMD	Marion	8,146	✓	✓	✓		✓	✓	✓	✓			✓		✓
Two Mile Prairie	SWFWMD TIITF	Citrus	2,980	✓		✓		✓	✓		✓					
Potts Preserve	SWFWMD	Citrus	9,379	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓
Half Moon Wildlife Management Area	SWFWMD TIITF	Sumter	9,565	✓	✓	✓		✓	✓		✓	✓				
Flying Eagle	SWFWMD	Citrus	16,331	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓
Lake Panasoffkee Preserve	SWFWMD	Sumter	10,320	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓
Panasoffkee Outlet	SWFWMD	Sumter	807	✓				✓	✓	✓	✓					✓
Annutteliga Hammock	SWFWMD	Hernando	344	✓		✓		✓	✓							
Marjorie Harris Carr Cross Florida Greenway State Recreation and Conservation Area	TIITF SWFWMD	Citrus Marion Sumter	10,905	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓		
Withlacoochee State Forest	TIITF	Sumter Citrus Hernando	97,052	✓	✓	✓		✓	✓	✓	✓	✓				✓
Ross Prairie State Forest	TIITF	Marion	3,527	✓		✓	✓	✓	✓	✓		✓				✓
Flat Island Preserve	Lake County Water Authority	Lake	2,364	✓	✓		✓	✓	✓	✓	✓					
Fort Cooper State Park	TIITF	Citrus	708	✓	✓		✓	✓	✓	✓	✓			✓		✓
Withlacoochee State Trail (46 miles)	TIITF	Citrus	625	✓	✓	✓		✓	✓	✓			✓			✓
Chassahowitzka Wildlife Management Area	TIITF	Citrus	33,919	✓	✓			✓	✓	✓		✓				
Chinsugut Wildlife and Environmental Area	TIITF U.S Dept. of Education	Hernando	822	✓				✓	✓	✓				✓	✓	✓
Cypress Lakes Preserve	TIITF Hernando County	Hernando	342	✓				✓	✓							
Fickett Hammock Preserve	Hernando County	Hernando	81	✓				✓	✓							
Perry Oldenburg Mitigation Park Wildlife and Environmental Area	FFWCC	Hernando	371	✓				✓	✓							

Table 2. Land Use Matrix for Flying Eagle Preserve

Land Use Categories	Resource-Dependant Recreation															
	Mobility-impaired access	Access-Walkthrough	Access-5 vehicle maximum	Access->5 vehicles	Bicycling- Unimproved dirt trail	Birdwatching	Camping-Backpacking	Camping-Group	Equestrian	Hiking	Geocaching	Interpretive areas or trails	Nature Viewing	Nature Photography	Special Hunts	Wildlife Management Area
Management Zones																
Preservation-1		✓			✓	✓			✓	✓	✓		✓	✓		✓
Preservation-2		✓			✓	✓			✓	✓	✓		✓	✓	✓	
Preservation 3		✓				✓				✓	✓		✓	✓		✓
Preservation 4																
Special Protection 1		✓			✓	✓			✓	✓	✓		✓	✓	✓	
Special Protection 2		✓			✓	✓				✓	✓		✓	✓		✓
Recreation 1		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓		
Recreation 2		✓		✓	✓	✓				✓	✓	✓	✓	✓		
Recreation 3		✓	✓	✓	✓	✓	✓		✓	✓	✓		✓	✓		
Special Use 1	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓		
Special Use 2		✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓		
Special Use 3		✓			✓	✓				✓	✓		✓	✓		

Demand, Supply and Opportunities Summary

The Citrus County Comprehensive Plan indicates that from 1980 t0 2000, Citrus County was the tenth fastest growing county in Florida in percent population change. The estimated County population in 2010, 2015 and 2020 is 141,300, 153,200 and 165,400 respectively. Land use planning for Flying Eagle Preserve must incorporate projected population increases as well as the types of resource-dependant recreation opportunities that will be desired. An age profile of the population around Flying Eagle Preserve was considered in determining which types of resource-dependant recreation opportunities the local population would anticipate at the Preserve. Age profiles are commonly used by national and state recreation providers to identify recreational use trends. The population adjacent to Flying Eagle Preserve will likely participate in horseback riding, bicycling, hiking, canoeing, camping, bird watching and backpacking. Citrus County's Comprehensive Plan indicates that by the year 2025, there will be a need for more hiking, camping and picnicking opportunities county-wide. These resource-dependant recreation demands and others will be fulfilled collectively by existing and future opportunities managed by state agencies, Citrus County and the District. District staff will continue to monitor supply and demand needs for this area that may be indicated in the Citrus County Comprehensive Plan.

Limitations

The land use zones at Flying Eagle Preserve are established to protect and preserve documented sensitive habitat and wildlife and ensure the property serves the conservation purpose for which it was acquired. Available land uses are limited with the presence of vast wetlands throughout the property and interwoven state lands. Security concerns in the area of the youth camp and sensitive habitat along the Withlacoochee River create constraints as well.

Public recreational opportunities that require minimal amenities were considered for Flying Eagle Preserve. Consequently, only those resource-dependant recreation activities that could co-exist on the existing base trail network and still experience a quality recreation experience were considered compatible with the long-term management objectives for the property. As a result, the recreational experience offered at Flying Eagle Preserve will be geared toward passive resource-based users seeking to experience the property's scenic qualities and view outstanding wildlife.

Conclusion

Based on the intrinsic character of Flying Eagle Preserve, current and projected recreational opportunities available on public lands within the planning region, current and projected public recreation need, and site opportunities and limitations, Flying Eagle Preserve will feature quality passive, resource-dependent recreational uses. Further, recreation will be managed such that the distinction between the use intensities of the east and west sides of the Preserve will be maintained. The location and types of uses are depicted in Figure 4 and in conjunction with the Land Use Matrix in Table 2.

Management Goals

A significant component in successfully protecting and managing the Flying Eagle Preserve is the establishment of goals to guide these activities. Below are program area management-related goals that have been developed as a result of the planning process and in recognition of activities accomplished under the previous plan:

Resource Protection and Security Program

Goals

- Continue to identify and address security issues on the Flying Eagle Preserve.
- Generate a security plan that includes education and public outreach.
- When available, explore potential acquisitions of parcels that, while further enhancing the conservation value of the Flying Eagle Preserve, serve to improve access and security.
- Assist the Gulf Ridge Council (or subsequent entity responsible for management of the youth camp) as needed to determine and implement an appropriate security plan for the protection of visitors to the youth camp.
- Remove unnecessary interior fencing from within the McGregor-Smith addition.
- Assess all fencing along the boundary to ensure compliance with legal requirements and replace/install fencing as necessary. Continuously evaluate effectiveness of security and adapt as appropriate.

Public Use Program

Goals

- Evaluate recreational amenities to ensure accurate information is presented in periodic Recreation Guide and update as needed.
- Increase volunteer activity focusing on recreational amenities and resource management services.
- Schedule public speaking engagements and field trips with adjacent and potentially impacted residential communities and user groups to educate residents and users on resource management activities, particularly ongoing restoration, exotic species control and prescribed fire application. Develop relationships with neighbors and user groups to facilitate communication and feedback loops on management activities.
- Enhance monitoring program for recreation use areas and trails. Establish methods to most effectively monitor trail use, number of users, and suitability of public access points.
- Coordinate with the Gulf Ridge Council to seek alternative strategies to strengthen the partnership for the McGregor Smith youth camp. Strategies may include additional partners.

Land Maintenance Program

Goals

- Coordinate with the Gulf Ridge Council and additional youth center cooperators to develop a strategy for capital improvements and demolitions of existing structures in support of the youth center operation.

Fire Management Program

Goals

- Obtain necessary authorization from the DEP for use of heavy equipment in sovereign lands to conduct fireline construction and maintenance.
- Conduct one priority marsh burn between the East-West Dike Road and the main airboat trail and between Main Road and the river.
- Conduct remaining fuel reduction burns on the McGregor-Smith addition.
- Complete installation of upland firebreaks required for marsh burning. Coordinate with the District's Operations Department to complete.
- Coordinate with District Operations Section, Florida Division of Forestry (FDOF), and FWC to satisfy equipment and personnel requirements for large burns.
- Develop aerial burn plan for priority marsh areas. Include FDOF and FWC as necessary in the planning process.
- Coordinate with FDOF to develop a public outreach initiative to educate local residents on the importance of marsh burning on the property and what to expect when burns are conducted.
- Conduct postmechanical treatment burns of restoration units as they accumulate sufficient fuel loads. Burns will take place during the growing season whenever possible.
- Continue postmechanical treatment burns of restoration units as they accumulate sufficient fuel loads. Burns will take place during the growing season whenever possible.
- Conduct remaining priority marsh burn between the East-West Dike Road and the main airboat trail, and between Main Road and the river.
- Conduct second burn of one previously completed priority marsh unit.

Exotic Species Control Program

Goals

- Enhance mapping and prioritization of invasive plant infestations treatment. Treat accordingly and perform follow-up assessments of infestation sites.
- Monitor restored wetlands adjacent to Shinn Ditch for invasive plant infestations.
- Achieve maintenance level of feral hog control on Flying Eagle Preserve.
- Achieve maintenance level treatment status for Chinese tallow and cogon grass.
- Inventory and assess the need and ability to control invasive plants and wildlife. Review exotic plant management program to assess new infestations and establish priorities for species control. Adapt as necessary.

Water Resources and Natural Communities Restoration Program

Goals

- Develop control plan as needed to repair areas subject to erosion problems.
- Coordinate with FWC staff conducting pilot project to treat invasive marsh vegetation and other habitat enhancement projects as needed.
- On the McGregor-Smith addition, assess Grand Prairie uplands as a possible recipient site for native seed.
- Complete mechanical restoration of scrub including follow-up treatments and prescribed burns.
- Conduct seeding of Grand Prairie uplands if determined to be a suitable recipient site.

- Complete mechanical restoration of wet prairie.
- Identify and map gopher tortoise habitat enhancement areas and complete restoration (three to ten years).

Resource Utilization Program

Goals

- Continue to evaluate/explore potential for resource management activities to generate revenue, in ways that are renewable, to offset management costs.

Resource Monitoring Program

Goals

- Complete inventory of tortoise burrow locations and identify priority habitat improvement areas.
- Conduct scoping of tortoise burrows at selected locations to survey for commensal species such as gopher frog, Florida mouse, eastern indigo snake and eastern diamondback rattlesnake.

Appendix 1 - Management Zones and Definitions

Preservation Zones (P) – The function of preservation zones is the protection and restoration of water resources and natural systems. This includes portions of the project area where natural attributes exist in an essentially unaltered condition and water resource and natural systems function are normal and natural. These zones represent the areas most ecologically sensitive and which provide core functions to the overall ecological health of the Preserve and surrounding areas. Support of primary water resource and natural systems protection goals is the dominant management strategy. Low-impact uses or those that result in no loss of natural function may be considered.

Special Protection Areas (SP) – The function of special protection areas is to provide an additional level of protection to features of high importance or sensitivity. This designation offers the most protection and is used only when it is determined that standard protection measures provided under normal management practices are insufficient to protect the feature from potential risks.

Resource Management Zones (RM) – The function of resource management zones is to locate sustainable resource utilization so as to minimize the impacts of these uses on the water resource and natural systems function of the project. Areas that have been physically altered to a minimal or moderate degree by human actions fall into this category. Restoration of primary water resource and natural systems function and/or sustainable revenue-generating resource utilization through the establishment of timber management areas, leasing of pasture areas for cattle grazing and/or compatible multiple uses may share strategic importance.

Recreation Zones (R) – The function of recreation zones is to cluster moderate to high impact resource-dependent recreational uses, or high concentrations of users, in order to minimize the impact on the water resource and natural systems function of the project. Peripheral areas that have been modified substantially by human activities or that are highly influenced by surrounding high intensity uses, and/or located in close proximity to development centers, public utilities, and transportation corridors. The natural attributes may exist in a moderately to highly altered condition and water resource and natural systems function is moderately to highly altered. Accommodation of resource-dependent recreation and education facilities is the dominant management strategy.

Special Use Zones (SU) – The function of special use zones is to cluster compatible user-based and developed uses to minimize impacts to all other uses on the project. These include altered areas that are segregated from the other zones. They may be highly influenced by surrounding high intensity uses and/or located within close proximity to development centers, public utilities, and/or transportation corridors.

Public Transportation Zones (T) – The function of transportation zones is to provide adequate public vehicle access to the project. These are linear zones on the periphery of a project or along improved roads that link off-site public transportation facilities with improved recreation and special use zones. Public access for recreational uses is the primary management strategy.

Utility Zone (U) – This zone is established for existing areas that are used for transmitting or distributing utilities such as electric, water, sewer, gas, or telecommunications services that include underground or overhead pipelines, poles, towers, wire, or cables. Collocation is the preferred option for new linear utilities.

Appendix 2

Land Use Matrix - Resource-Dependant Recreation Activities and General Land Uses

Use Categories	Resource-Dependant Recreation																									Renewable Resource Utilization			Special Uses	
	Mobility-impaired access	Access-Walkthrough	Access-5 vehicles	Access->5 vehicles	Access Equestrian	Bicycling- Unimproved dirt trail	Bicycling - Mountain	Birdwatching	Camping-Backpacking	Camping-Group	Camping Equestrian	Equestrian	Fishing- Shoreline	Fishing - Dock	Fishing - Fly	Hiking	Geocaching	Hunting - WMA	Hunting - Special	Interpretive areas or trails	Nature Viewing	Nature Photography	Paved Trail Uses	Swimming	Scuba Diving	Trail Running	Timber	Cattle	Other	Permanent Structure	User-Based Recreation
Management Zones																														
Preservation Zone																														
Special Protection Area																														
Resource Management Zone																														
Recreation Zone																														
Special Protection Zone																														
Public Transportation Zones																														
Utility Zones																														

Appendix 3

The diverse habitats that comprise the Tsala Apopka region support a variety of unique and rare plants. The following is a list of those documented on the Flying Eagle Preserve:

Common Name	Scientific Name	Natural Community
Abscised spleenwort	*Asplenium abscissum*	Mesic hammock
Angular fruit milkvine	*Gonolobus suberosus*	Mesic and hydric hammock
Copper ladies'-tresses	*Mesadenus lucayanus*	Mesic and xeric hammock
Cranachis ladies'-tresses	*Cyclopogon cranichoides*	Mesic hammock
Crested coralroot	*Hexalectris spicata*	Mesic hammock
Florida butterfly orchid	*Encyclia tampensis*	Mesic hammock
Florida spiny-pod	*Matelea floridana*	Mesic and xeric hammock
Giant wild pine	*Tillandsia utriculata*	Mesic hammock
Green-fly orchid	*Epidendrum conopseum*	Mesic hammock
Long-horned rein orchid	*Habenaria macroceratitis*	Mesic and hydric hammock
Plume polypody	*Pecluma plumula*	Mesic and hydric hammock
Swamp-plume polypody	*Pecluma ptilodon*	Basin swamp
Southern tubercled orchid	*Platanthera flava*	Hydric hammock
Three birds orchid	*Triphora trianthophora*	Mesic hammock
Trailing spiny-pod	*Matelea pubiflora*	Sandhill
Varicolored spleenwort	*Asplenium heterochroum*	Mesic hammock

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