Carlton Reserve Land Management Plan Resolution

1. Requested Motion: That the Board of County Commissioners approve the T. Mabry Carlton, Jr. Memorial Reserve Land Management Plan.

2. Meeting Date:

3. Subject: T. Mabry Carlton, Jr. Memorial Reserve Land Management Plan.

4. (2) Resolution

5. Background: Recreational access to the Carlton Reserve was outlined in the Public Use Plan adopted by the Board on July 28, 1992. A condition of approval was that a Land Management Plan be adopted prior to any public use facilities being developed on site. Public use facilities are scheduled to be completed in FY95. A draft Land Management Plan was distributed for public review and workshops were held on December 28, 1993, and January 12, 1994, to solicit additional comments from the public. Comments were incorporated into the Plan (attached as "Exhibit A") submitted for Board approval.

Contact person: Charles W. Barrowclough, Land Management Division (extension 6142)

S A R A S O T A C O U N T Y G O V E R N M E N T

INTEROFFICE MEMORANDUM

TO: John Wesley White, County Administrator

THROUGH: Robert S. LaSala, Deputy County Administrator

THROUGH: Gary S. Comp, Director, Natural Resources Department

FROM: Charles W. Barrowclough, Manager,
Land Management Division, Natural Resources Department

SUBJECT: Board of County Commissioners Item: Adoption of a Resolution in Support of a Land Management Plan for the T. Mabry Carlton, Jr. Memorial Reserve

DATE: June 2, 1994

RECOMMENDATION

That the Board adopt a Resolution in support of a Land Management Plan for the T. Mabry Carlton, Jr. Memorial Reserve.

REPORT

As directed by Resolution 82-200, and in accordance with both the Environment and Recreation and Open Space Chapters of APOXSEE, Sarasota County Land Management staff have prepared a comprehensive Land Management Plan for the T. Mabry Carlton, Jr. Memorial Reserve. The Land Management Plan has been developed to provide guidelines for present and future land managers who will be responsible for the stewardship and protection of the Reserve's natural and cultural resources. Proper resource management is critical to the continued survival of numerous threatened and endangered species which are present there. In addition, land management strategies outlined in the Plan have been developed in accordance with State regulations designed to protect the water quality of the "Wild and Scenic" Myakka River.

Previously, the Sarasota Board of County Commissioners agreed that the adoption of a comprehensive Land Management Plan would need to take place prior to the construction of public use facilities on the Reserve.

RESOLUTION NO. _____

RESOLUTION OF THE BOARD OF COUNTY COMMISSIONERS
SARASOTA COUNTY, FLORIDA

RE: ADOPTION OF THE LAND MANAGEMENT PLAN FOR THE T. MABRY CARLTON, JR. MEMORIAL RESERVE

WHEREAS, Resolution 82-200 specifies that a Comprehensive Management Plan for the entire Ringling-MacArthur Tract (some of which has since become the T. Mabry Carlton, Jr. Memorial Reserve) will be developed,

WHEREAS, the Sarasota Board of County Commissioners has requested that a Land Management Plan for the T. Mabry Carlton, Jr. Memorial Reserve (Carlton Reserve) be adopted prior to the construction of Public Use Facilities at the Carlton Reserve,

WHEREAS, the Land Management Plan developed establishes guidelines for the proper stewardship of the natural and cultural resources present on the Carlton Reserve,

WHEREAS, proper management of the Carlton Reserve's natural resources is necessary to help insure the long-term survival of several threatened and endangered species now present on the property,

WHEREAS, proper management of the Carlton Reserve's natural resources will help insure the protection of ground and surface water quality on the property,

WHEREAS, resource management strategies outlined in the plan complement resource management activities currently underway on adjoining public lands, such as Myakka River State Park, the Southwest Florida Water Management District property and the Pinelands Reserve, and,

WHEREAS, management objectives outlined in the plan comply with all applicable goals, objectives and policies outlined in APOXSEE's Recreation and Open Space Chapter, including Goal 1 and Policy 1.1.4, as well as those outlined in APOXSEE's Environment Chapter, including Goal 5, Objective 5.4 and Policies 5.4.2., 5.5.10, 5.6.5, 5.6.7 and 5.7.2; and

WHEREAS, the Land Management Plan for the T. Mabry Carlton, Jr. Memorial Reserve, developed by the County's Land Management Division, is consistent with Resolution 82-94, relating to the acquisition of the Carlton Reserve lands, the acquisition bond referendum approved by the voters of Sarasota County on November 2, 1982 and Resolution 82-200, the Statement of Environmental Commitment for the Management of the Ringling-MacArthur Tract;

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF SARASOTA COUNTY, FLORIDA:

1. That the Board hereby adopts the Land Management Plan developed by the County's Land Management Division (attached as "Exhibit A") as a guide for natural and cultural resource management on the T. Mabry Carlton, Jr. Memorial Reserve.

2. This Resolution shall take effect immediately upon adoption by the Board of County Commissioners.

PASSED AND DULY ADOPTED this _____ day of _____, A.D., 1994.

BOARD OF COUNTY COMMISSIONERS
OF SARASOTA COUNTY, FLORIDA

By:_____
Chairman

ATTEST:

KAREN E. RUSHING, Clerk of the Circuit Court, Ex-Officio Clerk for the Board of County Commissioners of Sarasota County, Florida

By:_____

Deputy Clerk

EXECUTIVE SUMMARY

Sarasota County owns approximately 24,565 acres known as the T. Mabry Carlton, Jr. Memorial Reserve ("Reserve") in the central portion of the County (Appendix A). The Reserve is bounded by Myakka River State Park and Southwest Florida Water Management District land on the north, the Myakka River on the west, Border Road and the city limits of North Port on the south, and on the east by a line extending from the northeast corner of Section 4 to the southeast corner of Section 33, both in Township 38 south, Range 21 east.

The Reserve is comprised of dry prairies and flatwoods, with numerous wetlands and hammocks interspersed. In all, approximately 24,265 acres will be maintained in a natural state. The water treatment facilities, associated roadways and wellfield sites will occupy an area of about 280 acres. Public use facilities will occupy approximately 20 acres.

The objectives of the land management plan, to be addressed both by short-term and long-term management goals, include the following:

- Preservation of the Carlton Reserve's natural integrity, linking it with Myakka River State Park, Southwest Florida Water Management District land and the Pinelands Reserve to form a preserve with an effective size of nearly 65,000 acres;

- Foster cooperation between the Land Management Division and other County and State agencies to coordinate management efforts and insure that all activities on the Reserve are compatible with the principles of this plan;
- Provide for increased protection of all natural communities, especially those considered to be imperiled, and all plants and animals, especially those designated as threatened, endangered or species of special concern;

- Provide opportunities for restoration of altered native upland and wetland habitats; and

- Provide opportunities for ecologically benign, non-consumptive, resource-based recreational and educational use by the public.

Healthy natural systems are also necessary for the continued existence of the Reserve's threatened and endangered species. All future activities on the Reserve, including wellfield development and construction of the public facilities, will be planned in an environmentally sensitive manner to minimize impacts to existing natural communities and associated flora and fauna. Natural cycles, such as more natural frequencies and seasonality of fires, and appropriate hydrological regimes, will also be restored to revitalize the Reserve's plant communities.

Management of exotic species such as feral hogs, melaleuca, Brazilian pepper, water hyacinth and hydrilla, will be necessary to minimize adverse effects on native plants and animals.

The management strategies outlined herein are intended as guidelines to be used by resource managers to address the complex management needs of the Reserve. This plan will be periodically updated to reflect current methodologies and advances in

technology as they apply to the resource needs and management of the Reserve.

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1.0. INTRODUCTION

1.1. Background

In 1982, Sarasota County voters approved a referendum allowing the County to issue general obligation bonds to purchase land as a potable water supply source and for recreation and open space purposes. The County purchased 16,074 acres in central Sarasota County from the MacArthur Foundation for approximately $18,500,000.00. Then, in 1987, an additional 8,238 acres were purchased for $4,900,000.00, bringing the total acreage up to 24,312 acres. In 1994, funds available through the Save Our Rivers program enabled the Southwest Florida Water Management District to purchase the remaining 8,249 acres owned by the MacArthur Foundation. As a condition of purchase, a land swap between the Water Management District and Sarasota County Government resulted in the addition of 253 acres to the T. Mabry Carlton, Jr. Memorial Reserve (Carlton Reserve). At present, the Carlton Reserve encompasses approximately 24,565 acres.

Located inland of highly populated coastal areas of west-central Florida, the Carlton Reserve, together with Myakka River State Park and the Myakka Prairie ~~adjoining Southwest Florida Water Management District land~~ is a regionally significant conservation/ recreation area. Numerous wetlands provide suitable habitat for a wide variety of wading bird species and a host of other species. Due to the mix of habitat types, a diverse array of plant and animal species inhabits the area.

1.2. Governing Documents

This management plan represents strategies that are consistent with best management objectives for the entire 24,565 acres and are to be governed by the following legal documents:

1. The Sarasota County Comprehensive Plan (APOXSEE);

2. Ordinance No. 82-94;

3. Resolution No. 82-200 concerning the protection of the MacArthur Tract;

4. Applicable State and federal statutes and associated regulations including but not limited to the Prescribed Burners' Act and the Endangered Species Act.

Portions of the governing documents that relate specifically to the Carlton Reserve's Land Management Plan are outlined on the following pages. Actions that have been implemented or that will be implemented to fulfill goals are also included.

1.2.1. APOXSEE, Recreation and Open Space Chapter

Goal 1

It shall be the goal of Sarasota County to provide, protect, and maintain a high-quality, environmentally-sensitive, accessible, economically efficient system of parks, recreation facilities, and

recreational open space that serves all Sarasota residents and visitors.

Policy 1.1.4.

Recreational uses implemented on the Pinelands Reserve and the T. Mabry Carlton, Jr. Memorial Reserve shall be limited to activities which are ecologically benign, non-consumptive and resource-based.

ACTION	IMPLEMENTED (prior to 1994)	SHORT TERM (1994-97)	LONG TERM (1998 or later)
1. Activities have been ~~will be~~ regulated through the issuance of access permits to insure compliance with this policy	X		
2. Public use facilities on the Carlton Reserve were located and designed to meet the recreational uses criteria set forth in this policy		X	X
3. Once Public use facilities on the Carlton Reserve are operational, public uses will be monitored by Reserve staff to insure compliance with these criteria		X	X

1.2.2. APOXSEE, Environment Chapter

Goal 5

Conserve, protect, maintain, and, where necessary, restore the natural resources of Sarasota County to ensure their continued

high quality and critical value to the quality of life in the County.

Objective 5.4.

To identify, manage, and protect all ecological communities and wildlife, especially critical habitats and endangered, threatened, and species of special concern identified in official federal, state, or international treaty lists.

Policy 5.4.2.

The County shall develop and implement protection guidelines for endangered and threatened populations of plants and wildlife that occur in the County. These guidelines will apply to both private and County-owned lands. The county shall encourage the use of management practices for the protection of species of special concern.

ACTION	IMPLEMENTED	SHORT TERM	LONG TERM
1. Inventory the Carlton Reserve for listed species (Appendices F and J)	X	X	X
2. Develop and implement protection guidelines for listed species present		X	X

Policy 5.5.10.

Maintain and promote rural and natural resource land management practices such as prescribed burning through the requirement that all new development in the Rural area or adjacent to Public Resource lands shall, as part of the development review process, recognize and accept existing rural and natural resource land management practices. Prescribed burning shall be facilitated through the organization of an inter-disciplinary/interagency task force.

ACTION	IMPLEMENTED	SHORT TERM	LONG TERM
1. Conduct fuel load reduction prescribed burns in cooperation with State Division of Forestry, Myakka River State Park, County and local fire departments and County Air Quality Program (Burn zones - Appendix B)	X	X	

ACTION	IMPLEMENTED	SHORT TERM	LONG TERM
2. Conduct habitat management prescribed burns during the appropriate season to restore more natural fire regimes in cooperation with State Division of Forestry, Myakka River State Park, County and local fire departments and County Air Quality Program	X		

Policy 5.6.5.

Where possible, nuisance exotic vegetation will be removed from new developments and County-owned property and replaced with native or other appropriate ornamental species.

ACTION	IMPLEMENTED	SHORT TERM	LONG TERM
1. Remove and/or treat exotic plants on the Carlton Reserve in cooperation with Sarasota County Stormwater Management Division	X		X
2. Where natural revegetation does			

not occur, the Land Management Division will coordinate with appropriate County staff, State agencies (Myakka River State Park, State Division of Forestry, etc.) and private organizations (Florida Natural Areas Inventory, The Nature Conservancy, etc.) to restore these areas				X

Policy 5.6.7.

Pursue an interdepartmental/interagency approach to the development of management plans and/or guidelines, by 1991, for County-owned public resource lands, right-of-way, and natural area parks
in order to protect, maintain, and restore, where necessary, native habitats. Previously approved management plans shall be considered in the implementation of this policy.

ACTION	IMPLEMENTED	SHORT TERM	LONG TERM
1. Develop comprehensive land management plan for Carlton Reserve		X	
2. All Water Use Permit activities associated with the Water Improvement Program will be reviewed by the Land Management Division to avoid and minimize environmental impacts of current and future development	X	X	X

Policy 5.7.2.

The County shall fund and implement the Ringling-MacArthur Reserve (Carlton Reserve) Public Use Plan including the establishment of the Environmental Education and Research Center, as proposed in the Ringling-MacArthur Reserve Land Use Plan.

ACTION	IMPLEMENTED	SHORT TERM	LONG TERM
1. Begin construction on Public use facilities		X	
2. Promote environmental education and research opportunities	X		X

1.2.3. Ordinance No. 82-94

Section 3

A bond referendum was held on November 2, 1982 to finance the cost of what was referred to as the Ringling-MacArthur Tract. It was purchased as a potable water supply source and for recreation and open space purposes. The use and management of the land must be consistent with the provisions of Resolution 82-200 of the Board of County Commissioners.

1.2.4. Resolution No. 82-200

Clauses most directly relating to the use and management of the Reserve include:

5. Water consumptive use plans, both as to quantity and mechanism for withdrawal, will be adopted only after the appropriate environmental, archaeological and historical sensitivity studies have been carried out to determine the areas requiring greatest protection.

ACTION	IMPLEMENTED	SHORT TERM	LONG TERM
1. Environmental assessments done by Biological Research Associates for CH2M Hill and by Dames and Moore	X		
2. Archaeological and historical sensitivity studies done by Piper Archaeological staff	X		
3. Maps depicting areas in need of greatest protection completed	X		
4. Water consumptive use plans adopted		X	

6. Water-withdrawal performance standards, i.e., quantitative limitations on the ecological impacts of water withdrawal, will be developed as part of the above environmental studies and a long-term program of proper monitoring for said impacts on the integrity of the existing Ringling-MacArthur Tract (Carlton Reserve) ecosystem, will be carried out.

ACTION	IMPLEMENTED	SHORT TERM	LONG TERM
1. Map expected 120-day surficial aquifer drawdown contours (at projected average pumpage rate of 10.45 million gallons/day) (Appendix C)	X		
2. Begin hydrological, hydroecological and vegetational monitoring	X		
3. Develop quantitative water-withdrawal			

performance standards (Appendix D) X

ACTION	IMPLEMENTED	SHORT TERM	LONG TERM
4. Sarasota County will continue to abide by the standards for wetland impacts outlined in item 26 on page 8 of 9 in Water Use Permit number 208836.00 (issued on September 24, 1991) even if these standards are revised in subsequent water use permits.	X	X	X

7. Based on technical, scientific, cultural and public input, a Comprehensive Management Plan for the entire Ringling-MacArthur Tract (Carlton Reserve) will be developed, which will address impacts and interactions of proposed uses.

ACTION	IMPLEMENTED	SHORT TERM	LONG TERM
1. Develop comprehensive land management plan for Carlton Reserve		X	
2. Implement Carlton Reserve land management plan			X

8. Wetlands and associated flora and fauna, found in such unique abundance on the Ringling-MacArthur Tract (Carlton Reserve), will be protected with a significant percentage of the total placed in a preservation

category.

ACTION	IMPLEMENTED	SHORT TERM	LONG TERM
1. Develop map to delineate protection areas		X	
2. Phase out use of large 4-wheel drive vehicles in favor of less damaging, lighter weight all-terrain vehicles		X	
3. Reroute trails impacting wetlands, wherever possible			X

9. Public use of the Ringling-MacArthur Tract (Carlton Reserve) in County ownership will be limited to water consumption, open space and recreation, with recreational activities receiving highest priority being characterized as non-consumptive, ecologically benign and resource-based. Special consideration will be given to environmental education and research, especially environmental management, ecology, agriculture and related sciences.

ACTION	IMPLEMENTED	SHORT TERM	LONG TERM
1. Provide public access for non-consumptive, ecologically benign and resource-based recreation	X	X	X
2. Invite scientists to conduct research on the Carlton Reserve	X	X	X

3. Provide facilities for environmental education programs				X
X				

10. Site planning and management of the Ringling-MacArthur Tract (Carlton Reserve) will be such that activities will be compatible with Myakka River State Park and possible impacts prevented, e.g., by providing an adequate buffer zone which would be of a use and management at least as protective as the adjoining park areas.

ACTION	IMPLEMENTED	SHORT TERM	LONG TERM
1. Consult regularly and work closely with Myakka River State Park Manager to coordinate resource management activities	X		X
X			
2. Establish permanent "no development" buffer zone along shared boundary with Myakka River State Park and Southwest Florida Water Management District land sufficient to prevent adverse impacts to the natural resources within the state park		X	

2.0. Description of the Reserve

2.1. Site Modifications

Although many areas appear fairly pristine, human influences have, in some manner, affected nearly all areas of the Reserve.
Some of the site modifications are very apparent, while others are much more subtle. Examples of some of the more obvious site modifications include construction of roads, utility line rights-of-way, wellsites and water treatment facilities, channelization of Deer Prairie Slough, off-road vehicle trails through wetlands, conversion of natural habitats to improved pasture, and the excavation of borrow pits. Other less obvious changes are the result of fire exclusion, changes in hydrological regimes, and air and water pollution.

2.2. Geology

The Reserve lies within two of the state's prominent physiographic regions: The Gulf Coastal Lowlands and the DeSoto Plain, both recently-emerged submarine plains. Nearly all of the Reserve lies within the Gulf Coastal Lowlands except the northeastern areas which ascend the slight incline to the DeSoto Plain (Geraghty and Miller, Inc., 1981).

During Pleistocene and pre-Pleistocene epochs (10,000+ years ago), marine sands were deposited along existing shorelines forming dune ridges and basins. Subtle variations in elevation are still apparent in some areas as a result of these ancient marine influences. Karst topography, which underlies much of Sarasota County, accounts for the multitude of solution features on the Reserve, though no major sinkholes have been identified on the property. In places, solution processes have dissolved underlying areas of limestone, resulting in the formation of shallow sinks and solution troughs (Florida Department of Natural Resources [FDNR], 1986). Today, these areas exist as wet prairies and sloughs, respectively. Flatwoods, dry prairies and hammocks occupy most of the former dune ridgetops.

Beneath the surface, several distinct geologic formations are present. Layers of clastic sedimentary deposits extend from just below the surface to depths of from 80 to 120 feet. These clastic layers are composed of sands and clays with interbedded layers of

sandy, dolomitic limestones. Collectively, they form the surficial aquifer and the underlying upper confining deposits. Further down, extending to depths of about 250 feet, limestones, dolostones and sands associated with the Hawthorn formation comprise the secondary artesian aquifer. Clay lenses, which serve to separate various productive zones within the secondary artesian aquifer, are present in certain areas. Below 250 feet, fairly impermeable layers of limestone, dolostones, sandstones, clays and sands are present, associated with the Tampa formation. These layers form the lower confining deposits which separate the secondary artesian aquifer from the underlying Floridan aquifer. The Floridan aquifer occurs just above the Suwannee limestone, at a depth generally greater than 400 feet (Geraghty and Miller, Inc., 1981).

2.2.1. Soils

As recorded by the U.S.D.A. Soil Survey for Sarasota County (1991), approximately 19 different soil types occur on the Reserve. Most of these soils are typical of pine flatwoods and dry prairie areas and include: Eau Gallie and Myakka fine sands, Ft. Green fine sand, Pineda fine sand, Pomello fine sand, Tavares fine sand and Wabasso fine sand.

Soils typical of wet prairies include the following: Bradenton fine sand (frequently flooded), Delray fine sand (depressional), Felda fine sand (depressional), Floridana and Gator soils (depressional), Gator muck, Holopaw fine sand (depressional) and Manatee loamy fine sand (depressional).

Soils most commonly associated with hammocks include the following: Bradenton fine sand, Delray and Astor soils (frequently flooded), Felda and Pompano fine sands (frequently flooded) and Pople fine sand.

Soils most often found in slough areas include many of the same soils associated with hammocks. Malabar fine sand is also present in the vicinity of some sloughs.

Plant communities associated with a given soil type may vary, depending upon other environmental factors, such as fire, hydrology and disturbances (either natural or manmade). Plant communities identified by soil types are meant only as a guideline

and may not necessarily be present, as described above.

2.2.2. Topography

Elevations at the Reserve range from about 10 feet above sea level along the Myakka River to almost 35 feet above sea level along the Reserve's northeastern boundary (United States Geological Survey, 1986). In general, the land surface slopes gently from the northeastern area of the Reserve downward to the west and southwest. Topographic features present are the result of previous marine influences and ongoing solution processes at work on layers of underlying limestone.

2.3. Water Resources

Water resources on the Reserve fall into three categories: atmospheric water, surface water and ground water. All are closely interrelated. During years of below normal rainfall, ground water levels in the water-table aquifer usually fall below average levels, resulting in less surface water runoff and a decrease in evapotranspiration rates. Conversely, the opposite occurs during years of above normal rainfall (Geraghty and Miller, Inc., 1981).

Despite tremendous surface water storage capabilities, it is unlikely that significant aquifer recharge occurs on the Carlton Reserve. This is due in large part to a hardpan layer or several semi-impermeable clay layers found at various depths beneath much of the Reserve. Deep sandy soils, usually typical of important recharge areas, are not generally present on the Carlton Reserve. As a result, the majority of precipitation eventually returns to the atmosphere either through evaporation or evapotranspiration, while some is carried off as surface runoff.

2.3.1. Atmospheric Water

Atmospheric water exists either as precipitation or as water vapor

produced by evaporation/evapotranspiration. In an average year, approximately 54 inches of rain falls in the region. About 60% of this total is the result of convectional showers or thunderstorms which typically occur almost daily during the rainy season (June through September). During the remainder of the year, rainfall events typically are associated with frontal passages. Unlike summertime showers and thunderstorms, which are extremely localized, frontal precipitation generally occurs over a much larger area (Geraghty and Miller, Inc., 1981).

Atmospheric water is replenished by both evaporation and evapotranspiration. To date, reliable data documenting both evaporation and evapotranspiration rates on the Carlton Reserve have not been collected. Future plans are to develop a comprehensive water budget for the Reserve, which will include this information.

2.3.2. Surface Water

Surface water is abundant on the Reserve. Surface water resources include the Myakka River, Deer Prairie Slough and a host of smaller sloughs, forested wetlands and numerous wet prairies or depression marshes. Surface water typically flows from northeast to southwest, draining into various slough systems and ultimately into the Myakka River. Recent channelization of Deer Prairie Slough has probably altered local surface water flow patterns to some degree, and has apparently resulted in shorter hydroperiods in wetlands nearby.

2.3.3. Ground Water

Ground water resources at the Reserve are available from three different strata: the surficial aquifer, the secondary artesian aquifer and the Floridan aquifer. The shallowest of these, the surficial aquifer, occurs from just below the land surface to a depth of as much as 80 feet in some areas. It is composed primarily of very fine to coarse-grained sand with some sandy limestone intermixed. The surficial aquifer water level rises and falls in response to a number of factors, including: rainfall, the rate of evapotranspiration and discharge to surface water bodies. Water quality of surficial water is generally good and is suitable for drinking after conventional treatment.

Beneath the surficial aquifer, the secondary artesian aquifer occurs at depths of 80 to nearly 400 feet within permeable units of the Hawthorn formation and Tampa limestone. Water drawn from the upper reaches of the secondary artesian aquifer (from 80 to 205 feet below the surface) can also be used for drinking following conventional purification measures.

The deepest of the three aquifers, the Floridan aquifer, occurs at depths exceeding 400 feet below the ground surface. Generally, potability of water is not as good within the Floridan aquifer as in the two shallower aquifers (Geraghty and Miller, Inc., 1981).

2.4. Vegetation

To date, nearly 475 species of vascular plants have been identified from the Reserve and as many as 46 additional species, thus far unidentified, have been noted (Appendix E). This list of species represents a compilation of plants noted in a 1986 floral survey conducted by Biological Research Associates and species observed during recent years by Sarasota County Land Management staff.

Currently, 22 species of plants occurring on the Reserve are listed as "threatened," "endangered" or as "commercially exploited" (Wood, 1993). Of these, two are classified as endangered, fifteen as threatened and five as commercially exploited. An additional two species are currently under review for federal listing. There are at least 24 species of plants on the Reserve requiring special management attention (Appendix F).

In addition to the diversity of plant species found on the Reserve, a complex array of plant community types are also present. These include pine flatwoods, scrubby flatwoods, dry prairies, a black- water stream, sloughs, wet prairies, contiguous wetland swamps, isolated wetland heads, hammocks and disturbed areas (Appendix G). The Reserve is mostly comprised of pine flatwoods and dry prairies (approximately sixty percent of acreage), and hammocks (approximately ten percent) interspersed with numerous depression marshes (approximately twenty percent). The remaining ten percent of the landscape is divided among various wetland habitats and former areas of rangeland and other disturbed or ruderal areas.

Of the natural community types present on the Reserve, four are currently considered to be threatened or endangered (Florida Natural Areas Inventory and FDNR, 1990). Imperiled habitats are ranked both on a statewide and global basis, according to their abundance and anticipated threats resulting from current land uses.

Scrubby flatwoods

Though only a small area of scrubby flatwoods is present on the Reserve, it is a very important habitat type and is home to the Florida scrub jay and many other scrub-dependent species. The Florida Natural Areas Inventory classifies scrubby flatwoods as an "S3" habitat type within the state and a "G3" habitat type worldwide. Both these designations signify that scrubby flatwoods are "very rare and local throughout their range (21-100 occurrences or less than 10,000 individuals) or are found locally in a restricted range or are vulnerable to extinction because of other factors.

To date, only five of the major habitat types have been mapped (Miller and Morris, 1978). A revised version of this habitat map, reflecting additional roadways, borrow pits and more recent habitat boundaries is appended (Appendix H). As the current map is refined, the most up-to-date version will be appended to successive management plan revisions every five years.

Dry Prairies

Dry prairies appear to be the most critically endangered habitat found on the Reserve. This particular habitat has been assigned an "S2" state ranking and a global ranking of "G2." These designations signify that dry prairie areas are imperiled both within the State, and worldwide, because of extreme rarity or vulnerability to extinction due to biological or man-made factors (Florida Natural Areas Inventory and FDNR, 1990).

Wet Prairies

Wet prairies (classified as depression marshes by Florida Natural Areas Inventory) have been assigned an "S3" designation, meaning that they are very rare and local throughout the State, occur in a restricted area of the State or are vulnerable to extinction

because of other factors (Florida Natural Areas Inventory and FDNR, 1990). Until further research can be done, wet prairies (depression marshes) also have been globally designated as a "G4?" element which is a temporary designation and specifies that this habitat type appears to be secure globally.

Blackwater Stream

The blackwater stream area (the Myakka River) contained within Reserve boundaries, is classified as an "S2" habitat type within the State and as a "G4" habitat type worldwide. As mentioned previously, "S2" means that blackwater streams are extremely rare within Florida or are vulnerable to extinction due to biological or other man-made factors. The "G4" rank means that this habitat type appears secure globally.

2.5. Wildlife

Because of the variety of plant community types found on the Reserve, a diverse assemblage of animal species is also present. Faunal surveys conducted by Biological Research Associates on the Reserve in 1986 revealed a total of 23 species of fish, 43 species of reptiles and amphibians, 117 species of birds and 21 species of mammals. An additional 21 fishes, 22 amphibians and reptiles, 93 birds and 20 mammals, were species identified which may also occur on the Reserve, but were not found during initial surveys (Biological Research Associates, 1986).

Wildlife sightings are informally recorded by staff from the County's Land Management Division during routine site visits. As new species are observed, they will continue to be added to the existing list. Information on insects and other invertebrates is lacking, and additional research on these groups will be encouraged. A detailed list of animal species currently known from the Reserve is appended (Appendix I).

In all, as many as 24 wildlife species (Appendix I) present on the Reserve are imperiled (Wood, 1993). Of these, 7 species classified as either threatened or endangered by State or federal agencies and several others requiring special management attention are described in detail in Appendix J. Because of the Reserve's suitability as potential habitat, the red-cockaded woodpecker,

Audubon's crested caracara and the Florida weasel are also discussed. For the same reason, and as a result of numerous, unconfirmed historical sightings, Florida panther information is also included. Because of their large home ranges and several unconfirmed sightings in the region, the Florida black bear is also discussed. Information on the Florida scrub jay is included due to numerous recent sightings on the property.

2.6. Archaeological and Historical Resources

Present day Sarasota County has been occupied by humans for over 11,000 years (Piper Archaeological Research, Incorporated, 1987). The earliest fossil records of human occupation from this prehistoric period come from the Little Salt Springs and Warm Mineral Springs areas. Radiocarbon dating has revealed that human remains recovered from these areas date back to approximately 10,000 B.C. Archaeologists believe that these native Paleo-Indians subsisted on the abundant provisions of nature and were primarily hunters and gatherers.

During more recent times ("historic period"), humans have colonized areas of the present day Reserve, and surrounding lands for a wide variety of uses. Cattle ranching, turpentining, timber harvest and hunting represent just a few of the most common of these.

In an effort to learn more about the Reserve's cultural history, the County commissioned Piper Archaeological Research, Inc. to conduct an archaeological survey in 1986. Results of the study indicated a total of 14 archaeological sites on the Reserve. This suggests that if time and money permit, a more thorough study should be conducted at some future date. Artifacts recovered during the Piper study indicate that the Reserve was occupied most intensively by prehistoric aboriginal groups during the middle Archaic period (about 5,000-3,000 B.C.). Evidence for less intensive utilization during the post-Archaic period (after 1,000 B.C.) also has been recovered.

From the locations of archaeological sites discovered, a cultural resource sensitivity map was developed (Appendix K). This map will serve as a planning tool to aid the County in managing the cultural resources present on the Reserve. Some caution is advised in interpreting the map since time and lack of funding did

not permit more thorough investigations of areas designated as "low probability" sites. Significant archaeological sites not yet discovered may remain in these areas.

According to the survey's recommendations, "complete avoidance of known sites is recommended, particularly Vicker's Head and Turpentine Camp #2 which are considered regionally significant cultural resources." The survey recommends that ground-disturbing activities such as grading, borrowing, filling, tree removal or ground vegetation removal be avoided in all high probability areas. Although the survey suggests that drilling and light vehicular traffic are permissible in these same areas, such activities should be discouraged until additional site surveys can be done. Thorough surveys are recommended prior to any construction in high probability areas.

Pre-construction surveys are recommended in both medium and low probability areas. Ground disturbance and vehicular traffic in medium probability areas should be minimized, though no restrictions are necessary in low probability areas. Additional drilling in any area of the Reserve, like other construction activities, should be contingent on the results of archaeological surveys conducted prior to site modification.

Because of the difficulty associated with investigating their locations, there is a possibility that unmapped prehistoric burial mounds or other inundated archaeological sites may also exist on Reserve property. For this reason, discoveries of mounds or areas containing wooden artifacts should be investigated by trained archaeologists. Any artifacts discovered on Reserve property will only be excavated by personnel trained to do so and will be stored at the Sarasota County Historical Resources Department. If deemed appropriate by Natural Resources and Historical Resources staff, certain artifacts may be utilized for interpretive displays or further scientific study.

3.0. Management Rationale

3.1. Biodiversity

The purpose of this land management plan is to provide direction for proper stewardship of all habitats and native species on the Reserve. This will include protection from unnatural disturbances, restoration where such disturbances have occurred, and recognition of natural cycles, such as fire and hydrologic regimes.

In order to maintain healthy, functioning ecosystems it is imperative that biodiversity be maintained and increased on the Reserve. Biodiversity is generally defined as "the variety and variability among living organisms and the ecological complexes in which they occur" (Office of Technology Assessment, 1987). Natural environmental conditions such as floods, droughts, storms, infestations and fires, usually do not affect biodiversity in a given area, as organisms living there have adapted to these cyclic changes. In many parts of the world, especially rapidly urbanizing areas, biodiversity has declined in recent years as a result of changes in the environment brought about by humans. Factors contributing to this decline include, but are not limited to, introductions of exotic species, alteration of hydrological regimes, changes in natural fire cycles, and contamination of air and water resources. Since ecosystems consist of a complex association of interdependent plants and animals, factors affecting one or more species can ultimately impact the entire ecosystem.

3.2. Wildlife Corridors

Wildlife corridors are travel pathways used by many species of wildlife, especially animals with large home ranges, which are necessary for feeding, establishing new territories and locating mates. Due to the increasing fragmentation of natural ecosystems, wildlife corridors are often severed, isolating wild animal populations. As a result, many species are unable to persist as food supplies dwindle and inbreeding becomes commonplace.

In order to help offset these problems, the Reserve will be managed with the intent to keep known and potential wildlife corridors intact. Riparian habitats along the Myakka River are

especially important and provide a link to Myakka River State Park to the north and the Pinelands Reserve to the northwest. Human-altered habitats associated with Deer Prairie Slough may also function as a potential wildlife corridor between the Reserve and Myakka River State Park. If existing linkages between the Reserve, the Southwest Florida Water Management District property, the protected portions of the Pinelands Reserve and Myakka River State Park are maintained, the result is a preserve with an effective size of nearly 65,000 acres. As such, this represents one of the largest protected natural areas in our region. Sarasota County will continue to work with landowners on a cooperative basis to encourage proper stewardship of adjacent private lands, many of which are important links in the existing wildlife corridor system.

3.3. County's Potable Water Supply

Since the Reserve is also being developed as the County's primary source of potable drinking water, management will necessitate protection of the area's water quality. Water quality monitoring, both by the Utilities Department and the Natural Resources Department, will continue so that any changes that may be detrimental to either the County's potable water supply or to the environment can be detected prior to becoming a significant threat.

If adverse impacts are demonstrated, the Land Management staff will recommend restrictions or curtailment of pumping, depending upon the severity of the impacts.

3.4. Recreation

As specified in Resolution 82-200, the Reserve will provide recreational opportunities for the citizens and visitors of Sarasota County. The intent is to provide ecologically benign, non-consumptive, resource-based recreation. This would encourage such activities as hiking, picnicking, birdwatching, botanical study and nature photography.

3.5. Prohibited Activities

In accordance with Resolution 82-200, activities such as off-road vehicle use, hunting, mining, grazing and silvicultural practices will not be allowed. Where appropriate for resource management,

exemptions may be granted by Sarasota County personnel for official County projects after careful review by Sarasota County Natural Resources Department staff.

4.0. Management Methodology

4.1. Ecosystem Management

Ecosystem management will be required to maintain and restore, as necessary, the natural character of native habitats on the Carlton Reserve. Proper management of the Reserve's resources will include such activities as prescribed burning, exotic plant and animal removal, passive protection of mesic hammocks and restoration of historic hydroperiods. Management guidelines and decisions will be based on the ecological character of the Reserve as a discreet unit and as a component of a larger ecological system that includes the Pinelands Reserve, the Southwest Florida Water Management District property, Myakka River State Park and adjacent lands. Management efforts for the Carlton Reserve will be coordinated with those of neighboring lands so that all of these areas are managed in a mutually compatible and complementary manner. A large ecosystem can be managed as a unit much more successfully than if managed as smaller separate entities.

Management techniques which are untested, or for which sufficient regional information is not available, may be implemented on an experimental basis, with replicates and controls. Such techniques may be tested on different research plots of a given habitat and the results monitored and analyzed to determine which method best attains management objectives.

4.1.1. Prescribed Burning

For many centuries, fire has played a major role in shaping Florida's vegetation patterns. In fact, many species of plants and animals have adapted to occasional fires and some even require it for their continued survival. Frequently, fires were ignited by lightning strikes accompanying late spring and early summer thunderstorms. Often these fires would burn for days, or even weeks, across the rural landscape. Unnatural barriers, such as roads, cities, canals, etc., no longer permit this and have interfered with normal fire patterns. For this reason, fire must periodically be reintroduced in areas where it otherwise naturally would have occurred. To more closely simulate natural conditions, it is preferable to burn during the lightning season (late spring/ early summer). Unfortunately, this is not always possible, especially in areas where dangerous fuel accumulations have

resulted from years of fire exclusion. In these areas, winter fuel-reduction burns will be necessary to reduce fuel levels before a more natural burn schedule can be safely employed. Once this is accomplished, these areas will be prescribed burned during the lightning season to continue the restoration process and maintain them in a more natural state.

Due to the rapidly urbanizing nature of Sarasota County, a great deal of advanced planning will be required to insure that smoke management concerns are addressed.

Presently, Sarasota County is employing a private contractor (Natural Resource Planning Services, Incorporated) to conduct prescribed burns on the Carlton Reserve. During 1993, approximately 4,850 acres were burned on two separate occasions using aerial ignition (incendiary devices dropped by helicopter). The primary advantage of this technique is that large parcels can be burned in a relatively short period of time. County Land Management Staff and Natural Resource Planning Services staff are continuing to work closely to plan future burns. At the present time, nearly all unburned areas have equal priority, such that the order in which parcels are to be burned will be determined by weather conditions and the contractor's schedule.

As excessive fuel loads diminish, burn schedules will gradually be shifted to a more natural pattern of predominantly summer fires. A burn plan is currently being developed for the Carlton Reserve. Because the burn plan will be designed with the flexibility to burn any one of several different zones during a given fire season, the order with which these areas are to be burned will depend, in large part, upon weather conditions preceding, and on the day of, the burn. Upon completion, a copy of the burn plan will be included as an addendum to this management plan.

4.1.2. Mechanical Treatment

Occasionally, fuel reduction burns may not be sufficient to reduce fuel levels and/or fuel heights in certain areas. Consequently, it may be necessary to utilize mechanical means to aid in restoring more natural conditions in these areas. This is most commonly done using either roller chopping or selective tree

removal or a combination of both techniques. Caution must be used whenever these techniques are employed to minimize soil disturbance so that natural sheet flow patterns are not altered. It should be emphasized that both practices are only recommended as an interim measure and, whenever possible, should be used in conjunction with prescribed burning techniques.

4.2. Exotic Plant and Animal Control

Exotic plants and animals are defined as species which are not native to a given region. Because they compete with native species for the same limited resources of food, water and shelter, exotic organisms can adversely affect native species. When conditions are ideal, exotic species have the potential to rapidly populate an area and can sometimes completely exclude native life forms. For these reasons an active exotic removal program is necessary to control nuisance species identified on the Reserve.

Management techniques which are untested, or for which sufficient regional information is not available, may be implemented on an experimental basis. Such techniques may be tested on exotic animals present and the results monitored and analyzed to determine which method best attains management objectives.

4.2.1. Plants

To date, as many as 21 species of non-native plants have been identified at the Reserve (see Appendix E). Collectively, these species occupy an estimated area of less than 5% of the total acreage on the Reserve. Though most infestations are small, several species are becoming more widespread, or have the potential to do so, and will require the most immediate attention (Exotic Pest Plant Council, 1993). These include:

Brazilian pepper tree (*Schinus terebinthifolius*)
water-lettuce (*Pistia stratiotes*)
Japanese climbing fern (*Lygodium japonicum*)
Melaleuca or punk tree (*Melaleuca quinquenervia*)
cogon grass (*Imperata cylindrica*)
torpedograss (*Panicum repens*)
water hyacinth (*Eichhornia crassipes*).
tropical soda apple (*Solanum viarum*)
hydrilla (*Hydrilla verticillata*)

paragrass	(Brachiaria mutica)
parrotfeather	(Myriophyllum aquaticum)
alligator weed	(Alternanthera philoxeroides)

As infestations of any of these species, or others with rapidly expanding populations, are identified, prompt treatments or manual removal efforts will begin. Where possible, removal by hand will be the preferred method. If herbicide treatments are necessary, the assistance of representatives from the County's Stormwater Environmental Utility will be solicited until Reserve staff are in place. Once a Reserve Manager and supplemental staff have been hired, a more detailed exotic removal plan will be developed.

4.2.2. Animals

Six non-native animal species are known to occur on Reserve property (see Appendix I). These include:

greenhouse frog	(Eleutherodactylus planirostrus planirostrus)
Cuban treefrog	(Hyla septentrionalis)
cattle egret	(Bubulcus ibis)
European starling	(Sturnus vulgaris)
nine-banded armadillo	(Dasypus novemcinctus)
feral hog; wild pig	(Sus scrofa)

The most serious threat appears to be feral hogs which are capable of widespread plant community disturbance. Rooting damage is most evident along roads and trails, but is also common in many of the Reserve's natural areas. Depending upon season, as much as 20-25% of the Reserve may exhibit rooting damage at any given time. Areas that have been rooted exhibit considerable soil disturbance which usually results in desiccation and death of the associated vegetative cover. A control program is necessary to remove a large enough proportion of the hog population so that further environmental degradation becomes insignificant.

A hog removal plan is currently being developed, and will involve live trapping and removal of hogs, on a continuous basis, by a certified contractor. Data including sex, age class and approximate weight will be collected from all trapped individuals to provide information on population characteristics. The

effectiveness of trapping will also be monitored. Monitoring will consist of track count censuses along permanent transects done prior to trapping and repeated at semi-annual intervals beginning one year after the commencement of trapping. This information will enable management to decide whether the trapping program should be continued, altered or eliminated altogether.

Because hogs prefer areas with dense understory vegetation (Frankenberger and Belden, 1976), an aggressive prescribed burning program, in conjunction with continuous live trapping efforts, is expected to provide the greatest level of control. With regular burning, understory vegetation will be maintained at a more natural density, creating conditions less hospitable for hogs.

The remaining four species also appear to be naturalized in our area; however, they are not believed to be causing significant environmental damage. Presently, there are no plans to control any of these species. If future research demonstrates the need for control of these species, or others introduced at some future date, appropriate control measures will be instituted at that time.

5.0. Specific Habitat Management

5.1. Introduction

Because humans have changed the world environment so much, we can no longer rely solely on nature to maintain healthy, functioning ecosystems. In many areas, ecosystems have been fragmented by development, disrupting natural fire cycles and severing natural wildlife movement corridors. Hydrological regimes in a number of areas have been changed, with little regard to the effect on natural systems. Other threats to natural communities are also human-related and include invasion by exotic species of plants and animals, acid precipitation, global warming and depletion of the ozone layer. Although there is little that can be done about these unnatural influences, proper resource management can offset some of their effects. For example, control of exotic species will be an ongoing management need in all habitats. Other management requirements for each habitat type are slightly different, and are outlined below.

5.2. Pine Flatwoods

Pine flatwoods require occasional fires to persist. For this reason, these areas will be prescribed burned at intervals of between one to eight years, as recommended by the Florida Natural Areas Inventory. Initially, winter season prescribed burns will be conducted until fuel conditions permit more natural lightning season (mid-May to mid-October) fires. Following fuel reduction burns, lightning season burns will serve as the primary management tool for the Reserve's pine flatwoods communities. However, because natural fires can occur during the winter season, areas of pine flatwoods will also be infrequently burned during the winter months. A random numbers table, weighted for summer burns, will be used to determine seasons and intervals between burns once initial fuel reduction burns have taken place.

In addition to fire management, exotic plant removal is of critical importance. Invasion by woody plants, such as Brazilian pepper (Schinus terebinthifolius), melaleuca (Melaleuca quinquenervia) and downy rose myrtle (Rhodomyrtus tomentosus), is a primary concern. Cogon grass (Imperata cylindrica) and other non-woody plants are also a threat in these areas. It will be the Reserve staff's responsibility to alert the County's Land

Management Division of exotic plant infestations in pine flatwoods areas, and all other natural communities on the Reserve. At that time, Land Management staff will make recommendations on the course of action to be taken.

5.3. Scrubby Flatwoods

Like pine flatwoods, periodic fires are necessary to maintain areas of scrubby flatwoods. In order to most closely simulate natural conditions, these areas will be prescribed burned at intervals of between eight to twenty-five years (Florida Natural Areas Inventory and FDNR, 1990). Initially, winter fuel reduction burns will be conducted until fuel conditions permit more natural lightning season fires. As with pine flatwoods, a random numbers table weighted for summer burns will be used to determine intervals between burns and to allow for occasional fires outside the lightning season.

Control of exotic species will also be of utmost importance. Strategies for control will be similar to those decribed for pine flatwoods habitats.

5.4. Dry Prairies

Management of dry prairies will be very similar to that of pine flatwoods communities. Like flatwoods areas, dry prairies are fire-dependent and will be maintained using prescribed fire. Natural fires in these areas appear to occur more frequently than in flatwoods communities, on the order of once every one to four years (Florida Natural Areas Inventory and FDNR, 1990). Winter fuel-reduction burns will be conducted initially, with all zones eventually reverting to a lightning season burning regime. Infrequent winter burns will also be conducted to more closely simulate natural fire cycles. A method similar to that used to determine burn seasons and fire intervals for pine flatwoods will also be used for dry prairie habitats.

Exotic plant infestations are also a management concern in the Reserve's dry prairie habitats. Prompt attention will be

necessary to control these species once they are discovered. Recommendations for treatment and removal will be made by Land Management staff.

5.5. Blackwater Stream (The Myakka River)

Approximately 6.5 miles of the Myakka River form the western boundary of the Reserve. This portion is part of the larger 34-mile segment of the river included in the Outstanding Florida Waters system and has been designated as a Florida Wild and Scenic River. Waters in this stretch of the river are designated Class I (FDNR, 1990). The U.S. Fish and Wildlife Service has identified this portion of the river as a "critical habitat" area for the endangered West Indian manatee (*Trichechus manatus latirostris*). For these reasons, management of potential impacts to the Myakka River is of utmost importance.

Management recommendations for the river include protecting fringing hammocks and associated wetlands from adverse impacts, routing stormwater runoff from impervious surfaces to retention ponds on site, and controlling exotic aquatic vegetation. Management efforts shall comply with all regulations applicable to the river's special designations (FDNR, 1990) and all subsequent regulatory documents. These will include enforcement of designated protection zones along the river and strict adherence to carrying capacities established by the Department of Environmental Protection.

5.6. Sloughs

Appropriate hydroperiods are of utmost importance for maintaining healthy slough systems. Wherever possible, natural hydrological patterns must be maintained or reestablished to most closely resemble historic conditions. Not only is the proper amount of water important, but also the seasonality of flooding and drying. Where hydroperiods have been altered, restoration will be attempted, and the degree of restoration possible will depend upon the availability of sufficient funds. All restoration in these areas will be coordinated with the Southwest Florida Water Management District.

Fire is also important in maintaining sloughs. Though sloughs rarely burn, except during extreme droughts, their extent is largely determined by fires that naturally occur in the adjacent upland habitats. Historically, sloughs served as natural firebreaks and would most commonly burn along the edges as fires from neighboring upland habitats moved into the area. For prescribed burning, sloughs will be used as firebreaks during wet periods; however, fire will not generally be applied directly to vegetation within the slough itself.

Because slough systems are extremely sensitive to disruptions of natural hydrological regimes, new construction will avoid impacting these areas. New roads and trails which will affect sheet flow into and out of slough systems will be constructed with "Geoweb," a pervious fabric that allows rainfall to infiltrate the ground, wherever possible.

5.7. Wet Prairies

In order to most closely approximate natural conditions, wet prairies will be allowed to burn when fire from adjacent upland habitats creeps into them. In nature, this occurs somewhere on the order of every one to four years (Florida Natural Areas Inventory and FDNR, 1990), primarily during the summer lightning season.

Maintaining historic hydroperiods is also critical in sustaining wet prairies. In areas where hydroperiods have been altered, natural conditions will be restored, to the extent possible. All restoration efforts will be coordinated with the Southwest Florida Water Management District.

Wherever feasible, roads, trails, firelanes and facilities will be constructed to avoid disruption of natural hydrological regimes and degradation of existing water quality in wet prairie areas. Where necessary, use of "Geoweb" fabric is preferred over the use of culverts, especially in areas where sheet flow occurs.

5.8. Contiguous Wetland Swamps

Because contiguous wetland swamps are naturally shaped by fire, they will not be completely protected from it. For this reason, fireplow lines will not be placed adjacent to these areas, unless necessary to suppress an uncontrolled fire. Though their extent is limited in part by fire, contiguous wetland swamps are not considered to be fire-dependent (fire is not required for their continued existence). In general, these swamps are usually too wet to sustain a fire.

Maintaining historic hydroperiods is also crucial to sustaining areas of contiguous wetland swamp. Where habitat degradation has already occurred, restoration will be done if feasible. All restoration attempts will be coordinated with the Southwest Florida Water Management District and will be contingent on sufficient funding.

5.9. Isolated Wetland Heads

Like contiguous wetland swamps, the fringes of isolated wetland heads are naturally pruned by fire. Consequently, isolated wetland heads will not be managed for protection from fire by placing fireplow lines around their perimeters. Infrequently, these areas do burn completely, though their continued existence is not fire-dependent. Sensitivity to historic fire intervals is a primary management concern. Typical fire intervals in these areas are 50-100 years or more (Florida Natural Areas Inventory and FDNR, 1990). After a fire, bay trees generally resprout, but severe fires may change this community into a different habitat type. If of sufficient size, heads can serve as firebreaks when standing water is present.

Because heads exist in areas of seepage, where the water table is high, they are extremely sensitive to changes in the local hydrology. Hydrological impacts associated with groundwater withdrawal will require close attention once wellfield production begins.

5.10. Hammocks

In general, hammocks on the Reserve will require little management attention. Like the preceeding habitats, hammocks are not fire-

dependent but are naturally pruned by fire. Attention to natural fire frequencies and removal of exotic species are the most urgent needs.

5.11. Disturbed Areas

Management needs in disturbed habitats will generally involve restoration of natural processes and removal of exotic species. Specific needs for the Reserve's disturbed areas are outlined below.

5.11.1. Improved Pasture

Improved pasture areas are those which have been planted with non-native forage grasses. On the Reserve, most have been planted with bahiagrass (Paspalum notatum). Though bahiagrass provides good forage for cattle, it outcompetes more desirable native plant species and persists for many years after grazing ceases. Short of large-scale herbicide application or manual removal, few methods to eliminate this species have been tried.

Before restoration begins, it will be necessary for managers to consult soil maps and early aerial photos to determine the historic plant community type(s) present. By using a series of innovative horticultural and silvicultural techniques, restoration measures can then be conducted.

In former pinelands, one possible approach would be to plant longleaf pines (Pinus palustris) at a high per acre density (1,000+ trees/acre) to create a dense, closed canopy. Within 20 to 25 years, shading and suffocation from pine litter should significantly reduce most understory vegetation. A partial thinning could then be conducted to allow in enough sunlight so that representative understory species could be planted. A sufficient density of pines would be left standing to provide adequate litter fall to begin prescribed burning once the plantings were established. Subsequent thinnings would be conducted to bring the overstory cover to a level representative of the natural community.

On the Reserve, management of large tracts of improved pasture will involve the reintroduction of fire and restoration of other natural processes, wherever possible. Prescribed burns will be

conducted during the lightning season, if conditions permit, and at frequencies approximating those typical of the natural community present prior to habitat alteration. In areas where hydrological patterns have been altered, restoration to more natural conditions will also be necessary.

In smaller areas of improved pasture, or on selected "experimental sites," other methods of restoration may be appropriate. If costs are not prohibitive, reforestation of some of these areas with locally grown trees and shrubs, in combination with the appropriate fire management scheme, may provide the best results. Reforested areas could serve as study sites to determine whether bahiagrass decreases and native plants increase in dominance over time.

5.11.2. Semi-Improved Pasture

Unlike improved pasture, areas of semi-improved pasture contain predominantly native forage grasses. Though somewhat less disturbed by man than improved pastureland, semi-improved pastures have been exposed to similar influences and may still require restoration. As with areas of improved pasture, restoration of semi-improved pasture will require the reintroduction of fire. In most areas, fuel levels should permit lightning season fires. Fire intervals should approximate those of the natural community type present before conversion to rangeland. If invasive exotic species are present, it is recommended that control measures be instituted to prevent further spread. Revegetation with native shrubs and trees is optional, but is probably not necessary in areas where natural vegetation surrounds semi-improved pastureland. Succession in these areas may be exceedingly slow, requiring decades to revert back to more natural conditions.

5.11.3. Borrow Pits

It shall be the Land Management Division's policy that no additional borrow pits be dug on Carlton Reserve property.

Where possible, existing borrow pits on the Reserve will be enhanced to more closely simulate natural wetlands on the site. In order to do so, water levels must first be temporarily lowered, so that the sloped sides can be regraded, to create a littoral zone around the edges. Plant materials selected for revegetation

will be locally grown nursery stock or transplanted specimens from nearby "donor" wetlands. Species may include any or all of the following pickerelweed (Pontederia cordata), sagittarias (Sagittaria spp.), white water lily (Nymphaea odorata), soft-stem bulrush (Scirpus validus), soft rush (Juncus effusus var. solutus), golden canna (Canna flaccida), prairie iris (Iris hexagona var. savannarum), maidencane (Panicum hemitomon), blue hyssop (Bacopa caroliniana), alligator lily (Hymenocallis palmeri). Other native wetland species may also be used, depending upon availability. It is expected that species diversity will increase as additional native species colonize these areas over time. In larger borrow pits, the creation of additional shallow, vegetated areas may further enhance wildlife values.

After planting, borrow pits will be monitored periodically to help insure that plants become established. It may be necessary to control cattails (Typha spp.), primrose willow (primarily Ludwigia peruviana), buttonbush (Cephalanthus occidentalis), Coastal Plain willow (Salix caroliniana) and other native woody species as well as invasive exotic species that threaten the success of restoration efforts. Once plants become established, these restored borrow pits will be managed in a manner similar to the management of the Reserve's depression marshes.

5.11.4. Disturbed Isolated Wetlands

The primary objective in the restoration of disturbed isolated wetlands is the restoration of more natural vegetation and hydrological patterns. Generally, ditches connecting or draining wetlands should be filled and dikes to retain or divert water should be removed.

Restoration of these areas is far from an exact science. Innovative approaches may be necessary to achieve the desired result. In smaller wetlands, it may be possible to regrade old ruts during the dry season and replant with appropriate native vegetation. In larger wetlands, regrading and large-scale planting may not be practical. In these larger wetlands, ruts should be regraded during the dry season and colonies of native vegetation should be established at intervals along ruts.

Expansion of these planted areas and natural recruitment will revegetate the wetland. All areas regraded and replanted will be monitored for several years to insure that plantings are successful. Control or removal of many of the same species that threaten borrow pit restoration efforts may also be necessary in these areas.

5.11.5. Deer Prairie Slough

Most of Deer Prairie Slough, south of the northernmost F.P.L. right-of-way, has been channelized during recent decades. However, the boundaries of hammock habitats that historically bordered the slough are still readily apparent in some areas. By mapping present hammock boundaries and consulting early aerial photos and old surveys, it should be possible to determine the location of the historic slough. Though it may not be possible to reroute Deer Prairie Slough exactly as it had been, it should be possible to restore it to a meandering system which approximates more natural conditions.

Sarasota County Natural Resources Department staff, working closely with the Southwest Florida Water Management District, the Florida Department of Environmental Protection and The Nature Conservancy, will attempt to develop an environmentally sound restoration plan for the slough. It is likely that in order to recreate the broad, shallow nature of the slough, it will be necessary to push existing spoil material back into the channelized streambed and recontour the banks to a more gradual slope. It is believed that once the channelization is corrected, the slough will gradually develop meanders on its own, recreating a more natural drainageway.

It is likely that restoration of this magnitude will be very costly. Grant money will be sought to help offset these costs.

5.11.6. Ruderal Land

Ruderal lands are areas of present or previous human activity where natural vegetation patterns have been altered as the result of these activities. Areas of ruderal habitat can include vegetation in and around public use facilities, well sites, the water treatment plant, former homesites, old roads and trails, powerline rights-of-way, firebreaks, etc. Because natural

vegetation patterns and other natural conditions have been altered, ruderal land often provides suitable habitat for exotic species and weedy native species. Resource managers must pay particular attention to these areas so that new exotic species are identified and treated promptly. Where necessary and prudent, prescribed fire will be employed in areas of ruderal habitat where restoration to more natural conditions is desired. Prescribed fires will be timed to approximate natural fire frequencies for the community type present prior to alteration. Revegetation of old roads, trails, firebreaks and other areas with native species, to facilitate the use of fire, or for other purposes, may also be appropriate.

6.0. Other Management Considerations

6.1. Abandoned Upland Roads and Trails

In areas where multiple roads provide access between two areas or in other instances where roads or trails are no longer necessary, restoration should be pursued. This can only be done when all vehicular travel through these areas has been discontinued. As with most other restoration efforts, limitations on personnel and funding will determine to what extent restoration is possible.

In some areas, it may be possible just to abandon roads and trails and allow them to revegetate naturally. Unfortunately, this usually occurs very slowly. An added concern is that these areas often provide suitable habitat for a variety of non-native plants which continue to persist or spread, even after abandonment.
If natural revegetation is not suitable, selected abandoned roads and trails may be replanted with appropriate native plant species. Original soil types and natural community types which were present prior to habitat alteration should serve as guidelines for restoration.

6.2. Impacts of Facilities and Visitor Use

Design, construction and use of the Reserve's facilities will be done responsibly to minimize adverse impacts to existing natural and cultural resources. This will be done through proper planning prior to facilities development and during construction (i.e. employing "environmentally friendly" technologies such as designing and constructing facilities which require minimal energy use, using xeriscape techniques around facilities, installing low flow showerheads and mulch toilets, etc.).

Impacts associated with visitation will also be minimized. Whenever possible, visitor use areas (trails, access roads, parking lots, picnic areas, campgrounds) will be placed outside sensitive habitats. For educational purposes, limited facilities (trails, primitive campsites) may be desirable in one or more of these sensitive habitats; if so, facilities will be planned and designed in such a way so as to result in minimal impacts.

As the popularity of the Reserve increases, it may be necessary to limit visitor numbers or access of some areas to visitors in order

to lessen adverse impacts associated with overuse.

6.3. Security

At present, the property boundaries of the Reserve are fenced, with the exception of the border with the Myakka River. All other access points are secured with gates and locks. The Border Road access point is monitored from 6:00 am to 6:00 pm, Monday through Friday, by a security guard employed through the Sarasota County Utilities Department's construction contractor. This access point is secured at night by a locking gate. In addition to the manned security point, periodic patrol of the Reserve is conducted by Sarasota County range deputies. Upon completion of the public use facilities, Reserve staff will be responsible for security and public safety.

7.0. Monitoring and Management Assessment

7.1. Hydrological Monitoring

Balancing natural resource protection and preservation with demands to meet the region's growing drinking water needs represents a significant management challenge. In order to identify and minimize detrimental effects related to drawdown, a thorough hydrological monitoring program has been initiated.

Recent monitoring efforts have been helpful in establishing baseline data against which future changes can be measured. Hydrological monitoring data currently being collected by County staff include rainfall, groundwater levels, groundwater quality and wetland water levels. All data are collected monthly, with the exception of groundwater quality data, which are collected quarterly. Future plans are to continue data collection on this same schedule, so that any changes resulting from groundwater withdrawal can be detected.

Surface water runoff and evapotranspiration rates for the Reserve are additional parameters to be monitored in the near future. Plans are to collect these data continuously using a radio-telemetry system.

7.2. Vegetation Monitoring

Currently, Land Management Division staff are monitoring wetland vegetation to establish baseline information on natural variations in vegetation patterns. Continued monitoring after wellfield production begins should indicate unnatural vegetation changes, and thus, impacts to wetland habitats that may result from drawdown of the water table. In addition to this work, other vegetation monitoring is also planned for the Reserve.

Of greatest importance initially, will be the location and mapping of especially significant plant populations on the Reserve. This includes not only populations of threatened and endangered species, but concentrations of potentially invasive exotic species, as well.

As natural communities come under better fire management, vegetation monitoring will be necessary to assess the effects of

prescribed burning. Studies will be designed to provide information on changes in species composition and changes in percent cover of species present in response to fire and on threatened and endangered species, as well as exotic species.

Other studies may be required to assess alternative management practices, including roller chopping, selective tree cutting and selective herbicide treatments, which may be instituted in conjunction with prescribed burning to better manage natural communities. It may be desirable to study impacts on natural habitats as a result of increasing human pressures on the Reserve's resources.

Proposals for additional scientific studies to be conducted by qualified independent researchers, will also be encouraged. Such proposals will be reviewed on a case-by-case basis to insure that proposed methodologies will not harm the Reserve's natural resources.

7.3. Wildlife Monitoring

To date, little research has been done on the fauna of the Reserve. Earlier work done by CH2M Hill resulted in a rudimentary list of animal species for the Reserve. Information on some groups is noticeably lacking, especially for insects and other invertebrate species. Requests from independent researchers to conduct scientific studies on the fauna of the Reserve will be handled in a manner similar to that outlined in the preceding section. As additional animal species are observed, they will be included on the existing species list.

Wildlife monitoring studies will also be conducted to determine trends in abundance of some species. Species that should be targeted include threatened and endangered species, and "keystone" species (those important for the survival of many other associated species) such as gopher tortoises and woodpeckers. Initially, baseline information regarding existing population sizes and structures for each of these species will be of greatest importance. In addition, population responses to various management practices, including prescribed burning, will be studied. Similar information for feral hogs will also be monitored.

Groups of wildlife that are important environmental indicators, such as amphibians, reptiles and wading birds will also be targeted. Resident populations of all three groups have declined sharply in Florida during recent years and studies of their populations on the Reserve will be encouraged. As with vegetation research, studies to assess impacts associated with humans may also be useful. As visitor use increases, it will be important to note wildlife impacts associated with increased human use.

Locations of special wildlife significance, such as eagle and osprey nests, wading bird rookeries and burrowing owl colonies will also be recorded.

7.4 Schedules for Management Assessments and Management Plan Updates

Ongoing management activities will be formally reviewed by qualified County staff on an annual basis in order to assess impacts on the Reserve's natural and cultural resources. A set of specific goals will be established by Land Management Division staff to be used by Reserve staff as a guideline for the current year's management needs. Should certain management issues require more immediate attention, they will be addressed on an "as needed" basis. Following adoption by the Board of County Commissioners, this management plan will be formally reviewed, and if necessary revised, every five years by Land Management staff. Public comments will be solicited and incorporated into these revisions, as appropriate.

8.0. Literature Cited

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APPENDIX A

REGIONAL LOCATION MAP

(refer to actual document)

APPENDIX B

BURN ZONE MAP

(refer to actual document)

APPENDIX C

POTENTIAL 120-DAY DRAWDOWN FOR THE SURFICIAL AQUIFER DUE TO WELLFIELD PRODUCTION (10.45 MILLION GALLONS/DAY AVERAGE) AND LOCATIONS OF WATER LEVEL MONITORING STATIONS

(drawdown contours mapped by Dames and Moore, 1989)

APPENDIX D

WATER WITHDRAWAL PERFORMANCE STANDARDS

(summary of information contained in Southwest Florida Water Management District Individual Water Use Permit number 208836.00)

Item 3 (on page 1 of 9)

The permittee shall not deviate from any of the terms or conditions of this permit without written approval by the District.

This permit authorizes the applicant named above to make a combined average annual withdrawal of 7,303,000 gallons of water per day, a combined peak monthly withdrawal of 9,625,000 gallons of water per day, and a maximum combined withdrawal rate not to exceed (not applicable) gallons per day. Withdrawals are authorized as shown in the table below.

USER I.D.	DIST. I.D.	WITHDRAWAL POINT LATITUDE	LONGITUDE	SEC-TWN-RGE	GALLONS PER DAY AVERAGE	PEAK MONTHLY	MAXIMUM
SP21	1	27 09 02	82 19 38	29 38S 20E	411,300	530,300	N/A
STP22	2	27 08 57	82 20 15	30 38S 20E	767,800	1,011,900	N/A
STP23	3	27 08 42	82 20 12	30 38S 20E	766,900	1,011,900	N/A
STP24	4	27 08 26	82 19 34	29 38S 20E	748,300	987,600	N/A
TP25	5	27 09 44	82 19 11	20 38S 20E	398,700	525,500	N/A
STP26	6	27 09 45	82 18 44	21 38S 20E	390,300	515,700	N/A
TP27	7	27 09 48	82 18 05	22 38S 20E	135,600	180,000	N/A
TP29	8	27 09 21	82 19 24	20 38S 20E	396,600	522,700	N/A

TP30	9	27	08	35	82	16	44	26	38S	20E	486,200 642,100 N/A
TP31	10	27	09	37	82	17	41	22	38S	20E	637,600 841,600 N/A
TP32	11	27	09	23	82	17	20	22	38S	20E	895,000 1,182,200 N/A
TP33	12	27	09	05	82	16	58	23	38S	20E	549,000 724,900 N/A
TP38	13	27	08	07	82	17	15	34	38S	20E	298,900 394,000 N/A
TP39	14	27	08	06	82	16	21	35	38S	20E	420,800 554,600 N/A

Item 26 (on page 8 of 9)

The Permittee shall immediately notify the Director, Venice Permitting Department, at any time the performance standards found in the *Basis of Review for Water Use Permit Applications, Part B, Section 4.2.A.4.* are not met. The following is a description of each standard:

a. Wet season water levels shall not deviate from their normal range.

b. Wetland hydroperiods shall not deviate from their normal range and duration to the extent that wetland plant species composition and community zonation are adversely impacted.

WATER WITHDRAWAL PERFORMANCE STANDARDS

(summary of information contained in Southwest Florida Water Management District Individual Water Use Permit number 208836.00)

Item 26 (on page 8 of 9) (Cont'd)

c. Wetland habitat functions, such as providing cover, breeding,

and feeding areas for obligate and facultative wetland animals shall be temporarily and spatially maintained, and not adversely impacted as a result of withdrawals.

d. Habitat for threatened or endangered species shall not be altered to the extent that utilization by those species is impaired.

Within 120 days of notification, a specific action plan must be submitted to the Director, Venice Permitting Department, for review and approval by District staff. This action plan should include a timetable for completion of any necessary corrective measures.

APPENDIX E

List of VASCULAR PLANTS
found at the
T. Mabry Carlton, Jr. Memorial Reserve, Sarasota County, FL

FAMILY	SCIENTIFIC NAME	COMMON NAME(S)
ACANTHACEAE	Justicia angusta	water willow
ACANTHACEAE	Justicia ovata	water willow
ACANTHACEAE	Ruellia caroliniana	wild petunia
ACERACEAE	Acer rubrum	red maple
ALISMATACEAE	Sagittaria graminea	sagittaria
ALISMATACEAE	Sagittaria isoetiformis	sagittaria
ALISMATACEAE	Sagittaria lancifolia	sagittaria
ALISMATACEAE	Sagittaria latifolia	sagittaria
ALISMATACEAE	Sagittaria sp.	sagittaria
ALISMATACEAE	Sagittaria subulata	sagittaria
AMARANTHACEAE	Alternanthera philoxeroides	alligator-weed
AMARANTHACEAE	Alternanthera sp.	chaff-flower
AMARANTHACEAE	Amaranthus spinosus	spiny amaranth
AMARANTHACEAE	Gomphrena serrata	globe amaranth
AMARANTHACEAE	Iresine diffusa	bloodleaf
AMARYLLIDACEAE	Crinum americanum	string lily; swamp lily
AMARYLLIDACEAE	Hymenocallis crassifolia	spider lily
AMARYLLIDACEAE	Hymenocallis palmeri	alligator lily
AMARYLLIDACEAE	Zephyranthes simpsonii	rain-lily
ANACARDIACEAE	Rhus copallina	winged sumac; shining sumac
ANACARDIACEAE	*Schinus terebinthifolius	Brazilian pepper; Florida holly tree

ANACARDIACEAE	Toxicodendron radicans	poison ivy
ANNONACEAE	Asimina reticulata	pawpaw
ANNONACEAE	Asimina sp.	pawpaw
APIACEAE	Centella asiatica	coinwort
APIACEAE	Eryngium baldwinii	s n a k e r o o t ; eryngium
APIACEAE	Eryngium yuccifolium	button snakeroot
APIACEAE	Hydrocotyle sp.	pennywort
APIACEAE	Hydrocotyle umbellata	marsh pennywort
APIACEAE	Oxypolis filiformis	water dropwort
APIACEAE	Ptilimnium capillaceum	mock bishop's-weed
AQUIFOLIACEAE	Ilex cassine	dahoon holly
AQUIFOLIACEAE	Ilex glabra	g a l l b e r r y ; inkberry
ARACEAE	Orontium aquaticum	g o l d e n c l u b ; neverwet
ARACEAE	Peltandra virginica	green arum
ARACEAE	*Pistia stratiotes	water-lettuce
ARECACEAE	Sabal palmetto	cabbage palm; sabal palm
ARECACEAE	Serenoa repens	saw palmetto
ASCLEPIADACEAE	Asclepias incarnata	swamp milkweed
ASCLEPIADACEAE	Asclepias lanceolata	milkweed
ASCLEPIADACEAE	Asclepias pedicellata	p e d i c e l l a t e milkweed
ASCLEPIADACEAE	Asclepias perennis	milkweed
ASCLEPIADACEAE	Asclepias tuberosa	b u t t e r f l y milkweed
ASCLEPIADACEAE	Matelea suberosa	milkweed
ASPIDIACEAE	Thelypteris interrupta T (FDA)	shield fern
ASPIDIACEAE	Thelypteris kunthii T (FDA)	shield fern
ASTERACEAE	Ageratina jucunda	hoarhound

ASTERACEAE	Ambrosia artemisiifolia	common ragweed
ASTERACEAE	Aster adnatus	aster
ASTERACEAE	Aster carolinianus	Carolina aster
ASTERACEAE	Aster dumosus	aster
ASTERACEAE	Aster reticulatus	white-topped aster
ASTERACEAE	Aster subulatus	aster
ASTERACEAE	Aster tortifolius	white-topped aster
ASTERACEAE	Baccharis glomeruliflora	groundsel tree
ASTERACEAE	Baccharis halimifolia	groundsel tree; sea myrtle
ASTERACEAE	Bidens alba var. radiata	Spanish needles
ASTERACEAE	Bidens laevis	burmarigold
ASTERACEAE	Bidens mitis	begger-ticks
ASTERACEAE	Bigelowia nudata	rayless goldenrod
ASTERACEAE	Boltonia diffusa	false aster; doll's daisy
ASTERACEAE	Carphephorus sp.	deer tongue
ASTERACEAE	Chaptalia tomentosa	pineland daisy
ASTERACEAE	Cirsium horridulum	horrid thistle
ASTERACEAE	Cirsium nuttallii	thistle
ASTERACEAE	Conoclinium coelestinum	mistflower
ASTERACEAE	Conyza canadensis var. pusilla	dwarf horseweed
ASTERACEAE	Coreopsis leavenworthii	tickseed; coreopsis
ASTERACEAE	Coreopsis sp.	tickseed; coreopsis
ASTERACEAE	Eclipta alba	aster
ASTERACEAE	Elephantopus elatus	Florida elephant's-foot
ASTERACEAE	Erechtites hieracifolia	fireweed
ASTERACEAE	Erigeron quercifolius	southern fleabane
ASTERACEAE	Erigeron vernus	fleabane
ASTERACEAE	Eupatorium capillifolium	dog fennel
ASTERACEAE	Eupatorium leptophyllum	boneset; thoroughwort
ASTERACEAE	Eupatorium mikanioides	semaphore eupatorium
ASTERACEAE	Eupatorium mohrii	boneset; thoroughwort
ASTERACEAE	Eupatorium rotundifolium	false hoarhound
ASTERACEAE	Eupatorium sp.	boneset; thoroughwort
ASTERACEAE	Euthamia minor	flat-topped goldenrod
ASTERACEAE	Flaveria linearis	yellowtop

ASTERACEAE	Gnaphalium obtusifolium	cudweed
ASTERACEAE	Helenium amarum	Spanish daisy; bitterweed
ASTERACEAE	Helenium pinnatifidum	sneezeweed
ASTERACEAE	Heterotheca subaxillaris	camphorweed
ASTERACEAE	Hieracium gronovii	hawkweed
ASTERACEAE	Iva microcephala	aster
ASTERACEAE	Liatris sp.	blazing star
ASTERACEAE	Lygodesmia aphylla	roserush
ASTERACEAE	Melanthera nivea	aster
ASTERACEAE	Mikania cordifolia	hemp vine
ASTERACEAE	Mikania scandens	hemp vine
ASTERACEAE	Pityopsis graminifolia	grass-leaved golden aster
ASTERACEAE	Pluchea foetida	marsh fleabane
ASTERACEAE	Pluchea odorata	saltmarsh fleabane; camphorweed
ASTERACEAE	Pluchea rosea	marsh fleabane
ASTERACEAE	Pterocaulon pycnostachyum	blackroot
ASTERACEAE	Rudbeckia hirta	black-eyed Susan
ASTERACEAE	Senecio glabellus	butterweed; golden ragwort
ASTERACEAE	Solidago chapmanii	goldenrod
ASTERACEAE	Solidago fistulosa	goldenrod
ASTERACEAE	Solidago sp.	goldenrod
ASTERACEAE	Verbesina virginica	frostweed
ASTERACEAE	Vernonia sp.	ironweed
BIGNONIACEAE	Campsis radicans	trumpet vine; trumpet creeper
BLECHNACEAE	Blechnum serrulatum	swamp fern
BLECHNACEAE	Woodwardia virginica	Virginia chain fern
BORAGINACEAE	Heliotropium polyphyllum	heliotrope
BRASSICACEAE	Cardamine sp.	cress
BRASSICACEAE	Rorippa teres	

BROMELIACEAE	Tillandsia bartramii T (FDA)	wild pine; air plant
BROMELIACEAE	Tillandsia fasciculata CE (FDA)	cardinal air plant; common air plant; common wild pine
BROMELIACEAE	Tillandsia recurvata	ball moss
BROMELIACEAE	Tillandsia setacea T (FDA)	grass-leaved air plant
BROMELIACEAE	Tillandsia usneoides	Spanish moss
BROMELIACEAE	Tillandsia utriculata CE (FDA)	giant air plant; giant wild pine
CACTACEAE	Opuntia humifusa	prickly pear
CAMPANULACEAE	Campanula floridana	Florida bellflower
CAMPANULACEAE	Lobelia feayana	bay lobelia
CAMPANULACEAE	Lobelia homophylla	white lobelia
CAMPANULACEAE	Lobelia paludosa	lobelia
CANNACEAE	Canna flaccida	golden canna
CAPRIFOLIACEAE	Sambucus canadensis	elderberry
CAPRIFOLIACEAE	Viburnum obovatum	Small viburnum
CARYOPHYLLACEAE	Drymaria cordata	West Indian chickweed
CARYOPHYLLACEAE	Stipulicida setacea	wire plant
CERATOPHYLLACEAE	Ceratophyllum sp.	hornwort
CHENOPODIACEAE	Chenopodium ambrosioides	Mexican tea
CHRYSOBALANACEAE	Licania michauxii	gopher apple

CISTACEAE	Helianthemum corymbosum	rock rose; frostweed
CISTACEAE	Lechea cernua	nodding pinweed; drooping pinweed
	E (FDA); C2 (USFWS)	
COMMELINACEAE	Commelina diffusa	day-flower
COMMELINACEAE	Commelina erecta	day-flower
COMMELINACEAE	Cuthbertia ornata	roseling
COMMELINACEAE	Murdannia nudiflora	murdannia
CONVOLVULACEAE	Dichondra caroliniensis	pony-foot
CONVOLVULACEAE	Ipomoea sagittata	glades morning-glory
CORNACEAE	Cornus foemina	stiff-cornel
CUCURBITACEAE	Melothria pendula	creeping cucumber
CYCADACEAE	Zamia pumila	Florida arrowroot; coontie
	CE (FDA); II (CITES)	
CYPERACEAE	Bulbostylis ciliatifolia	hair sedge
CYPERACEAE	Bulbostylis stenophylla	sedge
CYPERACEAE	Carex albolutescens	sedge
CYPERACEAE	Carex lupulina	sedge
CYPERACEAE	Cladium jamaicense	sawgrass
CYPERACEAE	Cyperus articulatus	sedge; nutgrass
CYPERACEAE	Cyperus compressus	sedge; nutgrass
CYPERACEAE	Cyperus distinctus	sedge; nutgrass
CYPERACEAE	Cyperus globulosus	sedge; nutgrass
CYPERACEAE	Cyperus haspan	sedge; nutgrass
CYPERACEAE	Cyperus odoratus	sedge; nutgrass
CYPERACEAE	Cyperus polystachyos	sedge; nutgrass
CYPERACEAE	Cyperus retrorsus	sedge; nutgrass
CYPERACEAE	Cyperus sp.	sedge; nutgrass
CYPERACEAE	Cyperus strigosus	sedge; nutgrass
CYPERACEAE	Cyperus surinamensis	sedge; nutgrass
CYPERACEAE	Dichromena colorata	white-tops; star

rush

CYPERACEAE	Dichromena latifolia	star rush
CYPERACEAE	Eleocharis baldwinii	roadgrass
CYPERACEAE	Eleocharis cellulosa	spikerush
CYPERACEAE	Eleocharis elongata	spikerush
CYPERACEAE	Eleocharis equisetoides	knotted spikerush
CYPERACEAE	Eleocharis fallax	spikerush
CYPERACEAE	Eleocharis interstincta	spikerush
CYPERACEAE	Eleocharis sp.	spikerush
CYPERACEAE	Eleocharis vivipara	spikerush
CYPERACEAE	Fimbristylis annua	sedge
CYPERACEAE	Fimbristylis puberula	sedge
CYPERACEAE	Fuirena pumila	umbrellagrass
CYPERACEAE	Fuirena scirpoidea	sedge
CYPERACEAE	Fuirena sp.	sedge
CYPERACEAE	Lipocarpha maculata	sedge
CYPERACEAE	Psilocarya nitens	sedge
CYPERACEAE	Rhynchospora cephalantha	beak-rush
CYPERACEAE	Rhynchospora corniculata	beak-rush
CYPERACEAE	Rhynchospora fascicularis	beak-rush
CYPERACEAE	Rhynchospora inundata	beak-rush
CYPERACEAE	Rhynchospora microcarpa	beak-rush
CYPERACEAE	Rhynchospora miliacea	beak-rush
CYPERACEAE	Rhynchospora plumosa	beak-rush
CYPERACEAE	Rhynchospora pusilla	beak-rush
CYPERACEAE	Rhynchospora sp.	beak-rush
CYPERACEAE	Rhynchospora tracyi	beak-rush
CYPERACEAE	Scirpus cubensis	bulrush
CYPERACEAE	Scirpus validus	soft-stem bulrush
CYPERACEAE	Scleria reticularis	reticulate nut sedge
CYPERACEAE	Scleria sp.	nut sedge
DAVALLIACEAE	Nephrolepis sp.	Boston fern; sword fern
DROSERACEAE	Drosera brevifolia	dwarf sundew
DROSERACEAE	Drosera capillaris	pink sundew
EBENACEAE	Diospyros virginiana	persimmon
ERICACEAE	Befaria racemosa	tarflower
ERICACEAE	Gaylussacia dumosa	d w a r f huckleberry

ERICACEAE	Lyonia fruticosa	staggerbush
ERICACEAE	Lyonia lucida	fetterbush
ERICACEAE	Vaccinium arboreum	sparkleberry
ERICACEAE	Vaccinium corymbosum	highbush blueberry
ERICACEAE	Vaccinium darrowii	blueberry
ERICACEAE	Vaccinium myrsinites	shiny blueberry
ERICACEAE	Vaccinium stamineum	deerberry
ERIOCAULACEAE	Eriocaulon compressum	p i p e w o r t ; hatpins
ERIOCAULACEAE	Eriocaulon decangulare	p i p e w o r t ; hatpins
ERIOCAULACEAE	Lachnocaulon anceps	bog-buttons
ERIOCAULACEAE	Syngonanthus flavidulus	bantam-buttons
EUPHORBIACEAE	Acalypha gracilens	t h r e e - s e e d e d mercury
EUPHORBIACEAE	Chamaesyce sp.	spurge
EUPHORBIACEAE	Cnidoscolus stimulosus	tread-softly
EUPHORBIACEAE	Crotonopsis linearis	rushfoil
EUPHORBIACEAE	Stillingia sylvatica	queen's delight
FABACEAE	Amorpha fruticosa	bastard indigo
FABACEAE	Apios americana	groundnut
FABACEAE	Cassia chamaecrista	partridge pea
FABACEAE	Cassia ligustrina	partridge pea
FABACEAE	Cassia nictitans	wild sensitive plant
FABACEAE	Crotalaria purshii	rabbit-bells
FABACEAE	*Crotalaria retusa	rabbit-bells
FABACEAE	Crotalaria rotundifolia	rabbit-bells
FABACEAE	Desmodium paniculatum	begger-ticks
FABACEAE	*Desmodium triflorum	begger-ticks
FABACEAE	Erythrina herbacea	coralbean
FABACEAE	Galactia elliottii	milk pea
FABACEAE	Galactia volubilis	milk pea
FABACEAE	Gleditsia aquatica	water-locust
FABACEAE	Indigofera suffruticosa	wild indigo
FABACEAE	*Macroptilium lathyroides	macroptilium
FABACEAE	Mimosa strigillosa	mimosa
FABACEAE	Sesbania emerus	bequilla
FABACEAE	Sesbania sp.	sesban
FABACEAE	Sesbania vesicaria	bladderpod

FABACEAE	Tephrosia sp.	hoary pea
FABACEAE	*Trifolium repens	white clover
FABACEAE	Vicia acutifolia	sand vetch
FABACEAE	Vigna luteola	cow-pea
FAGACEAE	Quercus geminata	sand live oak
FAGACEAE	Quercus laurifolia	laurel oak
FAGACEAE	Quercus minima	dwarf live oak
FAGACEAE	Quercus pumila	running oak
FAGACEAE	Quercus virginiana	live oak
FAGACEAE	Quercus sp.	oak
GENTIANACEAE	Nymphoides aquatica	floating hearts
GENTIANACEAE	Sabatia bartramii	Bartram's marsh pink
GENTIANACEAE	Sabatia brevifolia	marsh pink
GENTIANACEAE	Sabatia calycina	marsh pink
GENTIANACEAE	Sabatia grandiflora	marsh pink
GENTIANACEAE	Sabatia stellaris	marsh pink
HAEMODORACEAE	Lachnanthes caroliniana	redroot; bloodroot
HALORAGACEAE	Myriophyllum sp.	milfoil
HALORAGACEAE	Proserpinaca palustris	mermaid-weed
HALORAGACEAE	Proserpinaca pectinata	mermaid-weed
HYDOPHYLLACEAE	Hydrolea corymbosa	sky flower
HYDROCHARITACEAE	Limnobium spongia	frog's-bit
HYMENOPHYLLACEAE	*Lygodium japonicum	Japanese climbing fern
HYPERICACEAE	Hypericum cistifolium	St. John's-wort
HYPERICACEAE	Hypericum fasciculatum	St. John's-wort
HYPERICACEAE	Hypericum gentianoides	pineweeds
HYPERICACEAE	Hypericum hypericoides	St. Andrew's cross
HYPERICACEAE	Hypericum mutilum	St. John's-wort
HYPERICACEAE	Hypericum reductum	St. John's-wort
HYPERICACEAE	Hypericum sp.	St. John's-wort
HYPERICACEAE	Hypericum tetrapetalum	St. John's-wort

HYPERICACEAE	Triadenum virginicum	marsh St. John's-wort
HYPOXIDACEAE	Hypoxis juncea	yellow star-grass
HYPOXIDACEAE	Hypoxis leptocarpa	yellow star-grass
IRIDACEAE	Iris hexagona var. savannarum	prairie iris
IRIDACEAE	Sisyrinchium atlanticum	blue-eyed grass
JUNCACEAE	Juncus dichotomus	rush
JUNCACEAE	Juncus effusus	soft rush
JUNCACEAE	Juncus marginatus	rush
JUNCACEAE	Juncus megacephalus	rush
JUNCACEAE	Juncus polycephalus	rush
JUNCACEAE	Juncus repens	rush
JUNCACEAE	Juncus sp.	rush
LAMIACEAE	Hyptis alata	musky mint
LAMIACEAE	Lycopus rubellus	water hoarhound
LAMIACEAE	Physostegia purpurea	false dragonhead
LAMIACEAE	Piloblephis rigida	pennyroyal
LAMIACEAE	Salvia lyrata	lyre-leaved sage
LAMIACEAE	Scutellaria integrifolia	rough skullcap
LAMIACEAE	Teucrium canadense	wood sage; germander
LAMIACEAE	Trichostema dichotomum	blue curls
LAURACEAE	Persea palustris	swampbay
LEMNACEAE	Lemna obscura	duckweed
LEMNACEAE	Lemna valdiviana	duckweed
LEMNACEAE	Spirodela sp.	duckweed
LEMNACEAE	Wolffiella gladiata	bog-mat; mud-midget
LENTIBULARIACEAE	Pinguicula caerulea T (FDA)	blue butterwort
LENTIBULARIACEAE	Pinguicula lutea	yellow butterwort

		T (FDA)	
LENTIBULARIACEAE	Pinguicula pumila		s m a l l butterwort
		T (FDA)	
LENTIBULARIACEAE	Utricularia cornuta		h o r n e d bladderwort
LENTIBULARIACEAE	Utricularia floridana		bladderwort
LENTIBULARIACEAE	Utricularia foliosa		bladderwort
LENTIBULARIACEAE	Utricularia gibba		c o n e - s p u r bladderwort; h u m p e d bladderwort
LENTIBULARIACEAE	Utricularia inflata		f l o a t i n g bladderwort
LENTIBULARIACEAE	Utricularia purpurea		purple bladderwort
LENTIBULARIACEAE	Utricularia resupinata		bladderwort
LENTIBULARIACEAE	Utricularia subulata		bladderwort
LILIACEAE	Aletris lutea		y e l l o w c o l i c root
LILIACEAE	Lilium catesbaei	T (FDA); S3 (FNAI)	p i n e l i l y; southern red lily; Catesby's lily
LILIACEAE	Zigadenus densus		crow-poison
LINACEAE	Linum carteri var. smallii	E (FDA); C2 (USFWS); S2 (FNAI)	Carter's large-flowered flax; S o u t h Florida flax
LOGANIACEAE	Mitreola petiolata		miterwort
LOGANIACEAE	Polypremum procumbens		rustweed
LORANTHACEAE	Phoradendron serotinum		mistletoe
LYTHRACEAE	Cuphea carthagenensis		cuphea
LYTHRACEAE	Decodon verticillatus		willow-herb; s w a m p loosestrife
LYTHRACEAE	Lythrum flagellare	C2 (USFWS); S2,S3 (FNAI)	lowland loosestrife; c r e e p i n g

		loosestrife
MAGNOLIACEAE	Magnolia virginiana	sweet bay
MALVACEAE	Hibiscus grandiflorus	swamp hibiscus
MALVACEAE	*Urena lobata	Caesar-weed
MARANTACEAE	Thalia geniculata	t h a l i a ; fireflag
MELASTOMATACEAE	Rhexia cubensis	meadow beauty
MELASTOMATACEAE	Rhexia mariana	pale meadow beauty
MELASTOMATACEAE	Rhexia nuttallii	meadow beauty
MORACEAE	Morus rubra	red mulberry
MYRICACEAE	Myrica cerifera	wax myrtle
MYRSINACEAE	Ardisia escallonoides	marlberry
MYRSINACEAE	Rapanea punctata	myrsine
MYRTACEAE	*Melaleuca quinquenervia	melaleuca; punk tree; paperbark tree; c a j e p u t tree
NYMPHAEACEAE	Nuphar lutea subsp. macrophylla	spatter-dock
NYMPHAEACEAE	Nymphaea odorata	white waterlily
NYSSACEAE	Nyssa sylvatica var. biflora	swamp black gum; s w a m p tupelo
OLEACEAE	Fraxinus caroliniana	pop ash; water ash
ONAGRACEAE	Ludwigia arcuata	ludwigia
ONAGRACEAE	Ludwigia decurrens	ludwigia
ONAGRACEAE	Ludwigia leptocarpa	ludwigia
ONAGRACEAE	Ludwigia linifolia	ludwigia
ONAGRACEAE	Ludwigia maritima	coastal rattlebox

ONAGRACEAE	Ludwigia microcarpa	ludwigia
ONAGRACEAE	Ludwigia octovalvis	ludwigia
ONAGRACEAE	Ludwigia palustris	ludwigia
ONAGRACEAE	*Ludwigia peruviana	primrose willow
ONAGRACEAE	Ludwigia pilosa	ludwigia
ONAGRACEAE	Ludwigia repens	ludwigia
ONAGRACEAE	Ludwigia sp.	ludwigia
ONAGRACEAE	Ludwigia suffruticosa	ludwigia
ORCHIDACEAE	Calopogon sp. T (FDA); II (CITES)	grass-pink
ORCHIDACEAE	Encyclia tampensis T (FDA); II (CITES)	butterfly orchid
ORCHIDACEAE	Habenaria odontopetala T (FDA); II (CITES)	rein orchid
ORCHIDACEAE	Habenaria repens T (FDA); II (CITES)	water spider orchid; creeping orchid
ORCHIDACEAE	Spiranthes praecox T (FDA); II (CITES)	giant ladies'-tresses; grassleaved ladies'-tresses
ORCHIDACEAE	*Zeuxine strateumatica	lawn orchid
OSMUNDACEAE	Osmunda cinnamomea CE (FDA)	cinnamon fern
OSMUNDACEAE	Osmunda regalis CE (FDA)	royal fern
OXALIDACEAE	Oxalis florida subsp. prostrata	yellow wood sorrel
OXALIDACEAE	Oxalis sp.	wood sorrel
PARKERIACEAE	Ceratopteris sp.	water horn fern
PASSIFLORACEAE	Passiflora sp.	wild passion-

flower vine

PHYTOLACCACEAE	Phytolacca americana	pokeweed; pokeberry
PINACEAE	Pinus elliottii var. densa	South Florida slash pine
PINACEAE	Pinus palustris	longleaf pine
POACEAE	Amphicarpum muhlenbergianum	blue maidencane
POACEAE	Andropogon glomeratus	bushy bluestem
POACEAE	Andropogon sp.	bluestem grass
POACEAE	Andropogon virginicus	broomsedge
POACEAE	Aristida lanosa	longleaf threeawn
POACEAE	Aristida patula	tall threeawn
POACEAE	Aristida purpurascens	arrowfeather
POACEAE	Aristida spiciformis	bottlebrush threeawn
POACEAE	Aristida stricta	wiregrass
POACEAE	Axonopus affinis	common carpetgrass
POACEAE	Axonopus furcatus	big carpetgrass
POACEAE	Axonopus sp.	carpetgrass
POACEAE	*Chloris gayana	rhodesgrass
POACEAE	Coelorachis rugosa	wrinkled jointtail
POACEAE	Coelorachis tuberculosa C2 (USFWS); S3 (FNAI)	Florida jointtail; piedmont jointgrass
POACEAE	*Cynodon dactylon	Bermudagrass
POACEAE	Dichanthelium acuminatum	dichanthelium grass
POACEAE	Dichanthelium commutatum	dichanthelium grass
POACEAE	Dichanthelium dichotomum	dichanthelium grass
POACEAE	Dichanthelium erectifolium	dichanthelium grass
POACEAE	Dichanthelium laxiflorum	dichanthelium grass
POACEAE	Dichanthelium sabulorum	dichanthelium grass
POACEAE	Dichanthelium sp.	dichanthelium grass

POACEAE	Digitaria serotina	blanket crabgrass
POACEAE	*Echinochloa crusgalli	barnyardgrass
POACEAE	Echinochloa walteri	coast cockspur
POACEAE	*Eragrostis atrovirens	thalia lovegrass
POACEAE	Eragrostis elliottii	Elliott lovegrass
POACEAE	Eragrostis hypnoides	teal lovegrass
POACEAE	Eragrostis sp.	lovegrass
POACEAE	Erianthus giganteus	sugarcane plumegrass
POACEAE	Eustachys petraea	fingergrass
POACEAE	Gymnopogon chapmanianus	Chapman skeletongrass
POACEAE	Hydrochloa caroliniensis	watergrass
POACEAE	*Imperata cylindrica	cogon grass
POACEAE	Leersia hexandra	southern cutgrass; clubhead cutgrass
POACEAE	Leptochloa fascicularis	bearded spangletop
POACEAE	Leptochloa uninervia	Mexican spangletop
POACEAE	Oplismenus setarius	woodsgrass; basketgrass
POACEAE	Panicum anceps	beaked panicum
POACEAE	Panicum dichotomiflorum	fall panicum
POACEAE	Panicum hemitomon	maidencane
POACEAE	Panicum hians	gaping panicum
POACEAE	*Panicum repens	torpedograss
POACEAE	Panicum rigidulum	redtop panicum
POACEAE	Panicum tenerum	bluejoint panicum
POACEAE	Panicum virgatum	switchgrass
POACEAE	Paspalidium geminatum	Egyptian paspalidium
POACEAE	Paspalum conjugatum	sour paspalum
POACEAE	Paspalum dissectum	mudbank paspalum
POACEAE	Paspalum distichum	seashore paspalum
POACEAE	Paspalum laeve	field paspalum
POACEAE	*Paspalum notatum	bahiagrass
POACEAE	Paspalum repens	water paspalum
POACEAE	Paspalum setaceum	thin paspalum

POACEAE	Paspalum sp.	paspalum grass
POACEAE	Sacciolepis indica	India cupscale
POACEAE	Sacciolepis striata	American cupscale
POACEAE	Schizachyrium scoparium	little bluestem
POACEAE	Setaria geniculata	knotroot foxtail
POACEAE	Setaria magna	giant foxtail
POACEAE	Setaria sp.	foxtail grass
POACEAE	Sorghastrum sp.	indiangrass
POACEAE	Spartina bakeri	sand cordgrass
POACEAE	Sporobolus curtissii	Curtis' dropseed
POACEAE	Sporobolus junceus	pineywoods dropseed
POACEAE	Tripsacum dactyloides	eastern gama grass
POLYGALACEAE	Polygala balduinii	batchelor's button
POLYGALACEAE	Polygala boykinii	milkwort
POLYGALACEAE	Polygala cruciata	milkwort
POLYGALACEAE	Polygala cymosa	milkwort
POLYGALACEAE	Polygala grandiflora	large-flowered polygala
POLYGALACEAE	Polygala incarnata	milkwort
POLYGALACEAE	Polygala lutea	wild batchelor's button
POLYGALACEAE	Polygala nana	wild batchelor's button
POLYGALACEAE	Polygala polygama	milkwort
POLYGALACEAE	Polygala ramosa	milkwort
POLYGALACEAE	Polygala rugelii	yellow batchelor's
	T (FDA)	button
POLYGALACEAE	Polygala setacea	milkwort
POLYGONACEAE	Polygonum densiflorum	smartweed
POLYGONACEAE	Polygonum hydropiperoides	mild water-pepper
POLYGONACEAE	Polygonum punctatum	dotted smartweed
POLYGONACEAE	Polygonum sp.	smartweed
POLYGONACEAE	Rumex verticillatus	swamp dock

POLYPODIACEAE	Phlebodium aureum T (FDA)	golden polypody; serpent fern;
fern POLYPODIACEAE	Polypodium polypodioides var. michauxianum	gold-foot resurrection fern
PONTEDERIACEAE	*Eichhornia crassipes	water hyacinth
PONTEDERIACEAE	Pontederia cordata	pickerelweed
PORTULACCACEAE	Portulaca pilosa	pink purslane
PRIMULACEAE	Centunculus minimus	false pimpernel; chaffweed
PRIMULACEAE	Samolus valerandi subsp. parviflorus	pineland pimpernel
PTERIDACEAE	Pteridium aquilinum	bracken fern
RANUNCULACEAE	Clematis baldwinii	pine-hyacinth
RANUNCULACEAE	Clematis crispa	leather flower
RHAMNACEAE	Berchemia scandens	rattan vine
ROSACEAE	Rubus betulifolius	blackberry
ROSACEAE	Rubus sp.	blackberry
RUBIACEAE	Cephalanthus occidentalis	buttonbush
RUBIACEAE	Diodia teres	poor Joe
RUBIACEAE	Diodia virginiana	buttonweed
RUBIACEAE	Galium tinctorium	bedstraw
RUBIACEAE	Hedyotis procumbens	innocense
RUBIACEAE	Hedyotis uniflora	hedyotis
RUBIACEAE	Mitchella repens	partridge berry; twinberry
RUBIACEAE	Psychotria nervosa	wild coffee
RUBIACEAE	Psychotria sulzneri	wild coffee

RUBIACEAE	*Richardia brasiliensis	Richardia
RUBIACEAE	Spermacoce sp.	spermacoce
RUTACEAE	*Citrus sinensis	sweet orange
SALICACEAE	Salix caroliniana	coastal plain willow; Carolina willow
SALVINIACEAE	Azolla caroliniana	mosquito fern
SALVINIACEAE	Salvinia minima	water spangles
SAPOTACEAE	Bumelia reclinata	bumelia
SAXIFRAGACEAE	Itea virginica	Virginia willow
SCROPHULARIACEAE	Agalinis sp.	false foxglove
SCROPHULARIACEAE	Bacopa caroliniana	blue hyssop; lemon bacopa
SCROPHULARIACEAE	Bacopa monnieri	hyssop
SCROPHULARIACEAE	Bacopa sp.	hyssop
SCROPHULARIACEAE	Buchnera americana	blueheart
SCROPHULARIACEAE	Gratiola hispida	hedge hyssop
SCROPHULARIACEAE	Gratiola ramosa	hedge hyssop
SCROPHULARIACEAE	Gratiola virginiana	hedge hyssop
SCROPHULARIACEAE	Linaria canadensis	blue toadflax
SCROPHULARIACEAE	Lindernia anagallidea	false pimpernel
SCROPHULARIACEAE	Lindernia crustacea	false pimpernel
SCROPHULARIACEAE	Lindernia grandiflora	false pimpernel
SCROPHULARIACEAE	Lindernia sp.	false pimpernel
SCROPHULARIACEAE	Mecardonia acuminata	mecardonia
SCROPHULARIACEAE	Micranthemum umbrosum	micranthemum
SCROPHULARIACEAE	Scoparia dulcis	sweet broom
SCROPHULARIACEAE	Seymeria pectinata	seymeria
SMILACACEAE	Smilax auriculata	greenbrier; catbrier
SMILACACEAE	Smilax bona-nox	greenbrier; catbrier
SMILACACEAE	Smilax laurifolia	catbrier
SMILACACEAE	Smilax walteri	coral greenbrier

SOLANACEAE	Physalis angulata	ground cherry
SOLANACEAE	Physalis arenicola	ground cherry
SOLANACEAE	Physalis viscosa	ground cherry
SOLANACEAE	Solanum nigrescens	black nightshade
STYRACACEAE	Styrax americana	storax
THEACEAE	Gordonia lasianthus	loblolly bay
TURNERACEAE	Piriqueta caroliniana	piriqueta
TYPHACEAE	Typha latifolia	common cattail
TYPHACEAE	Typha sp.	cattail
ULMACEAE	Celtis laevigata	hackberry
ULMACEAE	Ulmus americana	American elm
URTICACEAE	Boehmeria cylindrica	false nettle; bog hemp
URTICACEAE	Parietaria floridana	parietaria
VERBENACEAE	Callicarpa americana	beautyberry
VERBENACEAE	Lippia nodiflora	frog-fruit; carpetweed
VERBENACEAE	Verbena scabra	harsh verbena
VIOLACEAE	Viola affinis	violet
VIOLACEAE	Viola lanceolata	long-leaf violet
VIOLACEAE	Viola septemloba	violet
VITACEAE	Ampelopsis arborea	pepper vine
VITACEAE	Parthenocissus quinquefolia	Virginia creeper; woodbine
VITACEAE	Vitis aestivalis	summer grape
VITACEAE	Vitis munsoniana	southern fox grape; scuppernong; muscadine grape
VITACEAE	Vitis rotundifolia	wild grape

VITACEAE	Vitis shuttleworthii		Calusa grape
VITTARIACEAE	Vittaria lineata T (FDA)		shoestring fern
XYRIDACEAE	Xyris brevifolia		yellow-eyed grass
XYRIDACEAE	Xyris caroliniana		yellow-eyed grass
XYRIDACEAE	Xyris elliottii		yellow-eyed grass
XYRIDACEAE	Xyris jupicai		yellow-eyed grass
XYRIDACEAE	Xyris smalliana		yellow-eyed grass
XYRIDACEAE	Xyris sp.		yellow-eyed grass

LEGEND

* = non-native species

FLORIDA GAME AND FRESHWATER FISH COMMISSION (FGFWFC) DESIGNATIONS

E = endangered
T = threatened
CE = commercially exploited

SSC = species of special concern

UNITED STATES FISH AND WILDLIFE SERVICE (USFWS) DESIGNATIONS

E = endangered
T = threatened
C1 or C2 = under review for listing
T(S/A) = threatened due to similarity of appearance

CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES OF WILD FAUNA AND FLORA (CITES) DESIGNATIONS

I = Appendix I species
II = Appendix II species

FLORIDA NATURAL AREAS INVENTORY (FNAI) DESIGNATIONS

S1 = Critically imperiled within the state because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.

S2 = Imperiled within the state because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some biological or man-made factor.

3 = Either very rare and local throughout its range (21 to 100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction because of other factors.

S4 = Apparently secure within the state (may be rare in parts of range).

S? or ? = Not yet ranked or temporary designation

Compiled by J. Weber
06-01-94

APPENDIX F

Descriptions of DESIGNATED PLANTS found on the T. Mabry Carlton, Jr. Memorial Reserve, Sarasota County, FL

Florida jointtail; Piedmont jointgrass
(Coelorachis tuberculosa)

As its common name implies, this grass can be identified by its segmented inflorescence, which usually appears during the summer months. Though more common in northern areas of the state, Florida jointtail extends southward into our area. It grows almost exclusively along the margins of ponds and marshes. Protection from hog rooting and maintenance of appropriate hydroperiods appear to be the primary management needs of this species.

Butterfly orchid
(Encyclia tampensis)

This species is an epiphytic orchid that most commonly grows on live oaks (Quercus virginiana), southern red cedars (Juniperus silicicola) cabbage palms (Serenoa repens) and pop ash (Fraxinus caroliniana).

Plants can be identified, when not in flower, by their conspicuous bulbous bases and long, thick, leathery, straplike leaves. Flowers are small, fragrant, mostly brownish-green with varying amounts of white and purple coloration present.

Most commonly, this species occurs in hammocks and contiguous hardwood swamps. Protection of these habitats from fire and unauthorized collecting are the primary management concerns.

Rein orchid
(Habenaria odontopetala)

This orchid is a terrestrial species which also has small, green flowers. They occur along a leafy stalk up to three feet tall, but usually much shorter. When not in flower, plants are a

diminutive rosette of conspicuously-veined, somewhat leathery, basal leaves.
Rein orchids occur in a variety of damp habitats including pine flatwoods, dry prairies, shady hammocks, and contiguous hardwood swamps.

Management needs include protection from unauthorized collecting and excessive soil disturbance, resulting primarily from hog rooting.

Water spider orchid; creeping orchid
(Habenaria repens)

The water spider orchid is also a terrestrial species with small green flowers, and closely resembles the preceding species, to which it is closely related.

On the Reserve, it occurs most commonly on floating mats of vegetation in various wetland areas. Management needs are similar to those of the preceding species.

Nodding pinweed; drooping pinweed
(Lechea cernua)

This uncommon species is only known to occur in a small area of xeric flatwoods, growing in Pomello fine sand, located northeast of the guardhouse near the Reserve's southern entrance. Typically, nodding pinweed occurs in sandhills and scrub habitat, though this is not so on the Reserve. Lechea cernua is endemic to Florida and is listed as endangered by the Florida Department of Agriculture (FDA).

When not in flower, plants appear as small rosettes of rounded leaves covered with soft whitish hairs. Tiny reddish flowers appear in July and August, borne singly, or in clusters, in the uppermost leaf axils along the flowering stalk.

Unfortunately, there are no recent records of this species from the Reserve since it was last reported in 1986. Additional field surveys will be conducted in the near future to better assess its current status.

Occasional fires, which serve to maintain a fairly open overstory,

appear to be necessary for this species to persist.

Pine lily; Catesby's lily; Southern red lily
(Lilium catesbaei)

Pine lilies are most commonly found in moist pinelands, marshes and wet prairies throughout Florida. They are easiest to recognize when in flower, usually during the summer and early fall, when the plants produce a red to red-orange, six-petaled, lily-like flower. Each petal is marked with a small amount of yellow and usually is speckled with purplish-brown dots near its attachment at the center of the flower. Flowers are generally borne singly atop a one to three foot stem.

Leaves are lanceolate, held somewhat erect and are arranged alternately along the stem. Basal leaves on each plant are the largest and leaves are reduced in size upward along the flowering stem.

The pine lily is listed as a threatened species by the FDA (Wood, 1993) and also as an S3 species (Florida Natural Areas Inventory and FDNR, 1990).

Management needs include periodic prescribed fire and protection from hog rooting. Prescribed fire maintains optimal pine lily habitat by limiting hardwood invasion. Like many other lilies, this species grows from an underground bulb, a feature that may enable plants to survive periodic fires. These bulbs may also be eaten by feral hogs, though it is not known to what extent they are utilized. Feral hogs in Great Smoky Mountains National Park feed heavily on wild lilies and may pose a threat to a rare lily species found there (Bratton, 1977). Future monitoring of the Reserve's lily population is suggested to help document what effects, if any, feral hogs are having on this threatened species.

Carter's large-flowered flax; South Florida flax
(Linum carteri var. smallii)

Carter's large-flowered flax occurs primarily in moist clearings, pine flatwoods and other cleared areas. Typically, this species is found in areas where sandy peat soils overlie limestone baserock.
Plants are herbaceous and grow to three feet tall, although they

usually are much shorter. Leaves are somewhat linear, untoothed, arranged spirally along the stem with considerable overlap, and tend to decrease in size upward along the stem. Flowers are golden yellow and generally disintegrate by mid-afternoon. Blooms appear mostly between February and April.

Important management considerations for this species include maintaining natural hydroperiods and fire frequencies. A reduction in feral hog populations to decrease impacts associated with hog rooting may be beneficial.

Lowland loosestrife; creeping loosestrife
(Lythrum flagellare)

This species is the only loosestrife species in our area with a creeping stoloniferous habit. It occurs most commonly along margins of ponds, ditchbanks and edges of cypress swamps.

Older stems of creeping loosestrife are usually completely prostrate with newer shoots ascending, arching or prostrate. Leaves are arranged opposite one another along the stem with reddish petioles and a conspicuous midvein. The small bright lavender flowers are evident throughout the year and are borne singly in the leaf axils.

Management needs include preservation of natural hydroperiods, protection from hog rooting, and control of shrub invasion through appropriate fire management.

Cinnamon fern
(Osmunda cinnamomea)

Although not rare, the cinnamon fern is sometimes used commercially in landscaping. It is quite common throughout the state in suitable habitats and occurs in scattered areas on the Reserve. Cinnamon ferns generally are found in damp, shaded areas and are easiest to recognize by their distinctly different sterile fronds and spore-bearing fronds. Plants grow in individual clumps and can attain a height of three feet or more.

With maintenance of appropriate hydroperiods and protection from excessive hog rooting, and from unauthorized collecting, this species should remain fairly secure.

Royal fern
(Osmunda regalis var. spectabilis)

As with the preceding species, royal fern is a fairly common species which is often used for commercial landscaping purposes. For this reason, it is listed as "commercially exploited" and could become threatened if overcollected from the wild. It occurs most commonly in swamps and other wet habitats.

Sterile fronds and spore-bearing fronds are similar in appearance, although the tips of the fertile fronds are somewhat constricted and contain the greenish spores.

Management needs are similar to those of the previous species.

Golden polypody; serpent fern; gold-foot fern
(Phlebodium aureum)

This epiphytic fern most commonly grows in cabbage palms (Sabal palmetto) and on live oaks (Quercus virginiana). The name "gold-foot fern" is derived from the conspicuous fuzzy golden rhizome from which the fronds grow. Fronds are up to 30 inches (70 centimeters) long with numerous golden sporangia arranged in rows along both sides of the midvein on each leaf segment.

Protection from unauthorized collection is the principal management concern.

Blue butterwort
(Pinguicula caerulea)

Blue butterwort is an insectivorous (insect-eating) plant that occurs infrequently in moist, acidic pineland areas. When not in flower, plants can be identified by their rosette of light green, somewhat slippery leaves with inrolled leaf margins.

In one of nature's most ingenious survival strategies, small insects become trapped on the sticky leaves and eventually are digested by these plants. By utilizing insects in this way, butterworts are able to subsist in relatively moist, infertile, acidic soils.

A single blue or purplish flower is borne atop a slender stalk, either in winter or in spring. Flowers have a conspicuous spur and a noticeable "veiny" appearance.

On the Reserve, this species occurs infrequently in dry prairie habitats. Unfortunately, dry prairies are also a favored rooting area for feral hogs and this may present a significant threat to this rare species. In general, management practices that promote the health of dry prairies should provide the best protection for existing blue butterwort populations.

Yellow butterwort
(*Pinguicula lutea*)

Yellow butterwort looks very similar to the preceding species and differs primarily in flower color. Like purple butterwort, it occurs primarily in dry prairies and is an infrequent species in these areas.

Management needs are also similar.

Small butterwort
(*Pinguicula pumila*)

Small butterwort, as its name implies, is generally much smaller than most of the other butterworts. This species is easily overlooked, as it generally grows less than eight inches tall. The solitary flowers are pale purple to whitish and are borne atop a short scape during the late winter or early spring months.

Management needs are similar to those for other butterworts.

Big yellow milkwort; yellow bachelor's button
(*Polygala rugelii*)

These plants, of moist pinelands and other damp areas, are found throughout the state. They can grow up to 30 inches (70 centimeters) tall and have opposite, untoothed leaves arranged alternately along the stem. Flowering occurs throughout the and flowers appear as globular, lemon yellow flower heads borne atop the stem.

Proper management of habitats where this species occurs will entail
maintaining proper hydroperiods and natural fire cycles. Protection from the impacts of hog rooting and unauthorized collecting are also warranted.

Giant ladies'-tresses
(Spiranthes praecox)

There are 11 different species of ladies'-tresses orchids that occur in Central Florida (Wunderlin, 1982); only this one has been identified at the Reserve. All are generally terrestrial species with a spiral or twisted arrangement of flowers at the top of the flower stalk. Giant ladies'-tresses occurs primarily in mesic flatwoods and dry prairies. This species can be distinguished from related species by the more tubular flowers, which typically appear during the spring and summer months, and less-pointed flower petals. Small, rounded teeth are present along the margin of the flower lip. Blooming generally occurs during the spring and summer months. When not in bloom, plants appear grasslike, and can easily be overlooked.

Primary management needs include maintaining appropriate hydroperiods, reducing hog-rooting impacts and maintaining proper fire frequencies.

Shield fern
(Thelypteris interrupta)

Collectively, 11 different species of shield ferns are found in Central Florida (Wunderlin, 1982). All are difficult to identify, especially to the untrained botanist. This species is distinguishable from other shield ferns by the arrangement of its sori (spore-bearing structures) on the undersides of the fronds and on the basis of other microscopic characteristics. As a group, these ferns prefer moist, shaded habitats and are often associated with hammocks and swamps. Protection from hog rooting and insuring appropriate hydroperiods will be necessary to help protect this species.

Shield fern
(Thelypteris kunthii)

Thelypteris kunthii is similar in general appearance to the preceding species. In the field, this species can often be recognized by its very dark green color, slightly wider leaflets and purplish rachis (central leaf stem). These characteristics can vary from plant to plant, so consulting a taxonomic key is highly recommended. Habitats, range and management needs are similar to those of Thelypteris interrupta.

Wild pine; air plant
(Tillandsia bartramii)

This species is an epiphyte of hammocks and swamps which reaches the southern limits of its range in our area. Plants resemble tufts of fine grass, though they are actually members of the bromeliad family. Often, the entire plant is covered with fine, hairlike scales and has a grayish tinge. The inflorescence is fairly inconspicuous, and consists of a small spike of purplish flowers with pink floral bracts. Flowering generally occurs during the spring and summer months.

Protection from unauthorized collection is the primary management need. Also, since many of the habitats in which this species occurs are not fire-dependent, protection from fire may also be important.

Cardinal air plant; common wild pine; common air plant
(Tillandsia fasciculata)

The cardinal air plant is so named because of its brilliant red inflorescence which typically appears during the fall. It is a member of the bromeliad family, growing most commonly on live oaks (Quercus virginiana) and cypress trees (Taxodium distichum and Taxodium ascendens). Plants consist of a series of narrow straplike leaves which radiate from a common point. Although distributed widely in swamps and hammocks located throughout peninsular Florida, this species, like most of the more showy

bromeliads, is highly sought after by collectors. For this reason, the Florida Department of Agriculture has listed it as commercially exploited.

Management needs are similar to those for the preceding species.

Grass-leaved air plant
(Tillandsia setacea)

Like the preceding species, the grass-leaved air plant is an epiphyte of hammocks and swamps in peninsular Florida. Plants resemble tufts of fine grass, though they are actually members of the bromeliad family. Often, the entire plant has a reddish tinge. The inflorescence is not as conspicuous as in Tillandsia fasciculata, and consists of a small spike of purplish flowers. Flowering generally occurs during the summer months. Management needs are similar to those for the cardinal air plant.

Giant air plant; giant wild pine
(Tillandsia utriculata)

The giant air plant, as its name implies, is the largest native bromeliad in Florida. Its broad, grayish-green, straplike leaves, coupled with its large size, make this species fairly easy to identify. When in flower, the flowering stalk often exceeds three feet tall and bears numerous, small, tubular, cream-colored flowers.

This air plant, like the previous examples, also is fairly common and occurs in similar habitats, in similar areas of the state. Management requirements are identical to those mentioned for other imperiled Tillandsia species.

Shoestring fern
(Vittaria lineata)

Although this species is a true fern, it superficially looks like a pendant clump of grass. Shoestring ferns are most commonly associated with hammocks and swamps, where they occur as an epiphytic species on cabbage palms (Sabal palmetto) and live oaks (Quercus virginiana). New leaves are borne tightly curled and gradually uncurl as they grow, just as those of many other fern species do. Spores are concealed beneath the leaf margins which

are tightly rolled under. At present, protection from unauthorized collectors seems to be the primary management need.

Florida arrowroot; coontie
(Zamia pumila)

These fernlike plants occur most commonly in dry, sandy pinelands, pine-palmetto flatwoods, sand ridges, hammocks and on Indian shell mounds. Coontie is a very interesting plant as it is a "living fossil" and has remained virtually unchanged for millions of years.

Plants are easily identified by their stiff, fernlike leaves and the presence of cones near the center of the crown. Leaves grow from a thick, underground, tuberous stem about the size of a sweet potato. Historically, coontie was an important food source for the Seminole Indians, who made "Seminole bread" from a starchy material extracted from the tuberlike underground stem. These plants are poisonous and much care had to be taken to insure proper preparation.

Plants are either male or female, with male plants bearing long, thin cones and female plants bearing larger, stout cones on thicker stalks. The bright orange-red, prismatic seeds are produced only on female plants.

Because this species is enjoying widespread use as a native landscaping plant, protection from unauthorized collection appears to be the primary management need.

APPENDIX G

Descriptions of NATURAL COMMUNITIES present on the T. Mabry Carlton, Jr. Memorial Reserve, Sarasota County, FL

Pine Flatwoods

The pine flatwoods is the most extensive habitat type, covering most of the southern half of the Reserve. Most of the flatwoods is considered to be of the mesic variety (alternating between wet and dry). In general, areas of mesic flatwoods are dominated by scattered to numerous South Florida slash pines (Pinus elliottii var. densa) with an understory of saw palmetto (Serenoa repens), fetterbush (Lyonia lucida), gallberry (Ilex glabra), wax myrtle (Myrica cerifera), winged sumac (Rhus copallina), wiregrass (Aristida stricta), and a variety of other grasses and herbaceous species. Mesic flatwoods are often inundated during the summer rainy season and typically become very dry during the winter months.

Occasional fires naturally occur in areas of pine flatwoods. These fires help encourage pine regeneration and minimize invasion by woody species such as oaks (Quercus spp.) and wax myrtle (Myrica cerifera). Many pine flatwoods species depend on periodic fire for their continued existence and will disappear from these areas in the absence of fire. When maintained under proper conditions, either naturally or through management, pine flatwoods communities, in general, contain one of the highest species diversities of any habitat type in Florida.

Scrubby Flatwoods

Only a very small amount of scrubby flatwoods is present on the Carlton Reserve (less than 10 acres). Though small, this natural community type is very important and provides suitable habitat for the threatened Florida scrub jay and many other scrub-dependent species. Small patches of scrubby flatwoods occur near the southern entrance to the Reserve and small, scattered patches also occur on the higher sandy ridges along the Myakka River's eastern bank. Fire is an important natural process in these areas and

helps maintain a shrublike hardwood layer. Numerous open, sandy patches are also common.

Species composition in scrubby flatwoods is a diverse mixture of species found in both scrub and pine flatwoods habitats. Understory species are generally more typical of scrub habitats, such as nodding pinweed (Lechea cernua) and prickly pear cactus (Opuntia humifusa), among others. Often a scattering of scrub oak species and shrubs, including Chapman's oak (Quercus chapmanii), sand live oak (Quercus geminata) myrtle oak (Quercus myrtifolia) and staggerbush (Lyonia fruticosa), comprise the midstory layer. The deep, porous sandy soils and elevations slightly higher than the surrounding areas, generally do not permit inundation, even during the wettest periods.

Dry Prairies

Areas similar to pine flatwoods, but containing virtually no pine trees, are also present on the Reserve. These areas, known as "dry prairies," are a globally imperiled habitat (Florida Natural Areas Inventory and FDNR, 1990). Though habitats resembling Florida's dry prairies occur elsewhere in the world, similar plant associations are not found outside of the State. Characteristically, Florida's dry prairies appear as vast prairie-like expanses of saw palmettos (Serenoa repens), various grasses, herbaceous plants and low shrubs such as wax myrtle (Myrica cerifera), gallberry (Ilex glabra) and fetterbush (Lyonia lucida). Trees are conspicuously absent in most of the areas, but do occur at very low densities in some areas of dry prairie. Trees, where they occur, are generally scattered sand live oaks (Quercus geminata), South Florida slash pines (Pinus elliotti var. densa) and cabbage palms (Sabal palmetto).

Periodic fires are also important in these areas and help to prevent invasion by trees. Other factors may limit tree densities, though the reasons for low tree densities are not yet fully understood. Some authorities believe dry prairies have increased in coverage over the years as an artifact of human activities and are not a natural biological community. Other authorities disagree and suggest that dry prairies were once more widespread than they are today but have dwindled during recent years in response to fire suppression.

Although the reasons for their existence are not yet fully understood, dry prairies are significant and require special management to help insure the continued survival of the rare species that live there. Both the Florida burrowing owl (Athene cunicularia floridana) and Audubon's crested caracara (Polyborus plancus audubonii), two animal species found nowhere else east of the Mississippi River, except Florida, require healthy dry prairie habitat to survive. Burrowing owls have been observed on the Carlton Reserve.

Blackwater Stream (The Myakka River)

The Myakka River forms a portion of the Reserve's western boundary. Vegetation associated with the Myakka River includes marsh pennywort (Hydrocotyle umbellata), duckweed (Lemna sp.), water spangles (Salvinia minima), cattails (Typha spp.), frog's-bit (Limnobium spongia), water hyacinth (Eichhornia crassipes), various bulrushes (Scirpus spp.) and sedges (Cyperus spp.). Because of the Myakka's dark, tannin-stained water and sandy bottom, it is classified as a "blackwater stream" (Florida Natural Areas Inventory and FDNR, 1990). This river system is especially significant because it drains much of the western half of the Reserve and is Sarasota County's only river. A substantial portion has been designated a State Wild and Scenic River by the FDNR (now known as the Florida Department of Environmental Protection).

Sloughs

Sloughs are seasonal creeks with a broad, ill-defined channel that occasionally dry up completely during extended droughts. Deer Prairie Slough, the largest slough system on the Reserve, drains an area of approximately 33.2 square miles, comprising much of the eastern half of the property (United States Geological Survey, 1986). Extensive channelization of the southern two-thirds of Deer Prairie Slough, during the 1950's, has significantly altered hydrological regimes and associated plant communities. Several smaller, more pristine slough systems, including Tiger Slough and Big Slough (draining the Reserve to the southeast) are also present. Vegetation associated with the Reserve's various sloughs includes pickerelweed (Pontederia cordata), sagittarias (Sagittaria spp.), sawgrass (Cladium jamaicense), maidencane (Panicum hemitomon), spatterdock (Nuphar luteum var.

macrophyllum), water lilies (Nymphaea sp.), St. John's-worts (Hypericum fasciculatum, other (Hypericum spp.), coinwort (Centella asiatica) and beak rush (Rhynchospora tracyi).

Wet Prairies

Wet prairies are numerous, seasonally wet depressions within the pine flatwoods areas. These areas, also known as depression marshes, are very conspicuous in aerial photos of Reserve property. In fact, they comprise approximately 20% of the total acreage contained within Reserve boundaries. Because of their abundance and relatively pristine condition, the Carlton Reserve's wet prairies are some of the finest examples of this ecological community type found in Florida. Typically, several distinct zones of vegetation are present in each of these wetlands, forming concentric circular bands. Near the center of the deeper wet prairies, the most common plants include pickerelweed (Pontederia cordata), sagittarias (Sagittaria spp.), spatterdock (Nuphar luteum subsp. macrophyllum) fireflag (Thalia geniculata) and water lilies (Nymphaea spp.). Hydroperiods in these areas are the longest and generally decrease in duration as one moves outward toward the fringes of the wetland. Dominant plants in shallower areas include a mixture of St. John's-worts (Hypericum fasciculatum and other Hypericum spp.), maidencane (Panicum hemitomon), sawgrass (Cladium jamaicense), spikerushes (Eleocharis spp.), yellow-eyed grasses (Xyris spp.), water-horn fern (Ceratopteris spp.), bladderworts (Utricularia spp.) and various sedges and rushes. Some woody species such as Coastal Plain willow (Salix caroliniana), buttonbush (Cephalanthus occidentalis), wax myrtle (Myrica cerifera) and primrose willows (Ludwigia spp.) may also be present. Periodic fires, especially during drier periods, help to maintain these areas in an open state and inhibit invasion by trees and shrubs. Hydroperiods can vary widely, depending upon seasonal rainfall, alteration of the local hydrology, and a number of other factors.

Contiguous Wetland Swamps

Contiguous wetland swamps, which are also known as floodplain swamps, occur primarily in the southwestern portion of the Reserve in association with slough systems that drain into the Myakka River. Vegetation in these areas consists largely of pop ash (Fraxinus caroliniana), laurel oak (Quercus laurifolia), red maple

(Acer rubrum), buttonbush (Cephalanthus occidentalis) and coastal plain willow (Salix caroliniana), along with climbing aster (Aster carolinianus), hemp vine (Mikania scandens), pepper vine (Ampelopsis arborea), Virginia creeper (Parthenocissus quinquefolia), swamp mallow (Hibiscus grandiflorus), dog fennel (Eupatorium sp.), camphorweed (Pluchea rosea) and fireweed (Erechtites hieracifolia). Protection from fire for extended periods and maintenance of natural hydrological patterns both appear to be necessary for these areas to persist.

Isolated Wetland Heads

Forested wetlands with a high percentage of bay trees are known as isolated wetland heads or bayheads. Dominant canopy species in these areas include black gum (Nyssa sylvatica var. biflora) and swamp bay (Persea palustris), with occasional sweet bay (Magnolia virginiana), loblolly bay (Gordonia lasianthus), laurel oak (Quercus laurifolia) and cabbage palm (Sabal palmetto). Other components include dahoon holly (Ilex cassine), Virginia willow (Itea virginica) and saw palmetto (Serenoa repens), on slightly higher ground. Infrequent fires and maintenance of natural hydrology are also necessary for the development of bayheads.

Hammocks

Along the Myakka River and fringing many of the wet prairie areas, narrow bands of forest, known as hammocks, commonly occur. The hammocks along the Myakka River have a slightly different character than those found elsewhere on the Reserve. Typically, hammocks associated with the river contain an overstory of cabbage palms (Sabal palmetto), laurel oaks (Quercus laurifolia), pop ash (Fraxinus caroliniana) and water locust (Gleditsia aquatica). Understory plants in these areas include saw palmetto (Serenoa repens), buttonbush (Cephalanthus occidentalis), groundsel tree (Baccharis spp.), and occasional small viburnum (Viburnum obovatum), buckthorn (Bumelia sp.), wild coffee (Psychotria sp.) and South Florida slash pine seedlings and saplings (Pinus elliottii var. densa). A number of epiphytic species ("air plants") are also common, including Spanish moss (Tillandsia usneoides), ball moss (Tillandsia utriculata), grass-leaved air plant (Tillandsia setacea), common wild pine (Tillandsia fasciculata), giant wild pine (Tillandsia utriculata), butterfly orchid (Encyclia tampensis), golden polypody (Phlebodium aureum),

shoestring fern (Vittaria lineata) and resurrection fern (Polypodium polypodioides var. michauxianum). Fires rarely occur in the Reserve's hammock areas, permitting dense tangles of wild grape vines (Vitis spp.) and catbrier vines (Smilax spp.) to ascend the trees. Sometimes hammock areas along the Myakka River are referred to as hydric hammocks due to their proximity to the river and their susceptibility to periods of extended flooding during the rainy season. Myakka River hammocks are especially picturesque because many of the cabbage palms gracefully lean out over the river.

Hammocks found elsewhere on the Reserve generally are dominated by live oak (Quercus virginiana), laurel oak (Quercus laurifolia) and cabbage palm (Sabal palmetto). These hammocks are sometimes referred to as mesic hammocks because plants here are adapted to periodic wet and dry conditions. Understory and epiphytic vegetation in these mesic hammocks is similar to that found in the hydric hammocks along the Myakka River. Flooding also can occur in these areas during periods of high water, though the duration is generally shorter and the frequency generally less than in hydric hammock areas.

Disturbed Areas

Improved and semi-improved pastures, along with disturbed and ruderal areas, such as power line right-of-ways and jeep trails, make up the final major habitat type found on the Reserve. All of these areas are altered natural habitats and many are legacies from past land uses. In many of the pasture areas, the dominant plant cover is bahiagrass (Paspalum notatum), an exotic grass native to tropical America. Other species common in these areas include dog fennel (Eupatorium sp.), frog-fruit (Lippia nodiflora), horrid thistle (Cirsium horridulum), wood sorrel (Oxalis sp.), rabbit tobacco (Gnaphalium sp.) and a variety of grasses, sedges and other herbaceous weedy species. Many of the same species grow along roads, jeep trails and power line right-of-ways. Areas of cogon grass (Imperata cylindrica), an aggressive non-native species, occur along several jeep trails within the Reserve and appear to be spread by vehicular travel. Removal of exotic species and restoration to more natural conditions will be top priorities in these areas.

APPENDIX H

NATURAL COMMUNITIES MAP

LEGEND

Wetland

Hammock

Pine Flatwoods

Dry Prairie

Semi-Improved Pasture
or Disturbed Area

Slough

Water Treatment Plant

==== Major Travelways

---- Jeep Trail

---- Southwest Florida Water Management District

Property Boundary

APPENDIX I

List of ANIMAL SPECIES
found at the
T. Mabry Carlton, Jr. Memorial Reserve, Sarasota County, FL

FISHES

FAMILY	SCIENTIFIC NAME	COMMON NAME(S)
AMIIDAE	Amia calva	bowfin
ATHERINIDAE	Labidesthes sicculus	brook silverside
CATOSTOMIDAE	Erimyzon sucetta	lake chubsucker
CENTRARCHIDAE	Enneacanthus gloriosus	bluespotted sunfish
CENTRARCHIDAE	Lepomis gulosus	warmouth
CENTRARCHIDAE	Lepomis punctatus	spotted sunfish
CENTRARCHIDAE	Micropterus salmoides	largemouth bass
CYPRINIDAE	Notemigonus crysoleucas	golden shiner
CYPRINIDAE	Notropis spp.	shiners
CYPRINODONTIDAE	Jordanella floridae	flagfish
ELASSOMATIDAE	Elassoma evergladei	Everglades pygmy sunfish
FUNDULIDAE	Fundulus chrysotus	golden topminnow
FUNDULIDAE	Fundulus cingulatus	banded topminnow
FUNDULIDAE	Fundulus seminolis	Seminole killifish
FUNDULIDAE	Lucania goodei	bluefin killifish
ICTALURIDAE	Noturus gyrinus	tadpole madtom

LEPISOSTEIDAE	Lepisosteus platyrhincus	Florida gar
MUGILIDAE	Mugil cephalus	striped mullet
PERCIDAE	Etheostoma fusiforme	swamp darter
POECILIIDAE	Gambusia affinis	eastern mosquitofish
POECILIIDAE	Heterandria formosa	least killifish
POECILIIDAE	Poecilia latipinna	sailfin molly
SOLEIDAE	Trinectes maculatus	hogchoker

AMPHIBIANS AND REPTILES

FAMILY	SCIENTIFIC NAME	COMMON NAME(S)
ALLIGATORIDAE	Alligator mississipiensis SSC (FGFWFC); T(S/A) (USFWS); II (CITES); S4 (FNAI)	American alligator
AMPHIUMIDAE	Amphiuma means	two-toed amphiuma
ANGUIDAE	Ophisaurus attenuatus longicaudus	eastern slender glass lizard
BUFONIDAE	Bufo quercicus	oak toad
BUFONIDAE	Bufo terrestris	southern toad
COLUBRIDAE	Coluber constrictor	racer
COLUBRIDAE	Drymarchon corais couperi T (FGFWFC); T (USFWS); S3 (FNAI)	eastern indigo snake
COLUBRIDAE	Elaphe obsoleta	rat snake
COLUBRIDAE	Farancia abacura abacura	eastern mud snake
COLUBRIDAE	Nerodia fasciata	banded water snake

COLUBRIDAE	Opheodrys aestivus	rough green snake
COLUBRIDAE	Regina alleni	striped crayfish snake
COLUBRIDAE	Seminatrix pygaea	swamp snake
COLUBRIDAE	Thamnophis sauritus sauritus	eastern ribbon snake
EMYDIDAE	Pseudemys floridana	Florida cooter
EMYDIDAE	Pseudemys nelsoni	Florida redbelly turtle
EMYDIDAE	Terrapene carolina	box turtle
HYLIDAE	Acris gryllus	southern cricket frog
HYLIDAE	Hyla cinera	green treefrog
HYLIDAE	Hyla femoralis	pinewoods treefrog
HYLIDAE	Hyla gratiosa	barking treefrog
HYLIDAE	*Hyla septentrionalis	Cuban treefrog
HYLIDAE	Hyla squirella	squirrel treefrog
HYLIDAE	Limnaoedus ocularis	little grass frog
HYLIDAE	Pseudacris nigrita	southern chorus frog
IGUANIDAE	Anolis carolinensis	green anole
KINOSTERNIDAE	Kinosternon baurii	striped mud turtle
KINOSTERNIDAE	Kinosternon subrubrum	mud turtle
KINOSTERNIDAE	Stenotherus odoratus	stinkpot
LEPTODACTYLIDAE	*Eleutherodactylus planirostrus planirostrus	greenhouse frog

AMPHIBIANS AND REPTILES (CONT'D)

FAMILY	SCIENTIFIC NAME	COMMON

NAME(S)		
MICROHYLIDAE	Gastrophryne carolinensis	eastern narrowmouth toad
RANIDAE	Rana areolata SSC (FGFWFC); C2 (USFWS); S3 (FNAI)	gopher frog; crawfish frog
RANIDAE	Rana catesbeiana	bullfrog
RANIDAE	Rana grylio	pig frog
RANIDAE	Rana utricularia	southern leopard frog
SCINCIDAE	Eumeces inexpectatus	southeastern five-lined skink
SCINCIDAE	Scincella lateralis	ground skink
SIRENIDAE	Siren lacertina	greater siren
TEIIDAE	Cnemidophorus sexlineatus sexlineatus	six-lined racerunner
TESTUDINIDAE	Gopherus polyphemus SSC (FGFWFC); C2 (USFWS); S3 (FNAI)	gopher tortoise
TRIONYCHIDAE	Apalone ferox (=Trionyx ferox)	Florida softshell
VIPERIDAE	Agkistrodon piscivorus	cottonmouth; water moccasin
VIPERIDAE	Crotalus adamanteus	eastern diamondback rattlesnake
VIPERIDAE	Sistrurus miliarius barbouri	dusky pygmy rattlesnake

BIRDS

FAMILY	SCIENTIFIC NAME	COMMON NAME(S)
ACCIPITRIDAE	Accipiter cooperii S3? (FNAI)	Cooper's hawk
ACCIPITRIDAE	Accipiter striatus	sharp-shinned hawk
ACCIPITRIDAE	Buteo jamaicensis	red-tailed hawk
ACCIPITRIDAE	Buteo lineatus	red-shouldered hawk
ACCIPITRIDAE	Circus cyaneus II	marsh hawk; northern harrier (CITES)

BIRDS (CONT'D)

FAMILY	SCIENTIFIC NAME	COMMON NAME(S)
ACCIPITRIDAE	Elanoides forficatus	American swallow-tailed kite
ACCIPITRIDAE	Haliaeetus leucocephalus T (FGFWFC); E (USFWS); I (CITES); S2S3 (FNAI)	bald eagle
ACCIPITRIDAE	Pandion haliaetus II (CITES); S3S4 (FNAI)	osprey
ALCEDINIDAE	Ceryle alcyon	belted kingfisher
ANATIDAE	Aix sponsa	wood duck
ANATIDAE	Anas discors	blue-winged teal
ANATIDAE	Anas fulvigula	mottled duck
ANATIDAE	Anas strepera	gadwall
ANHINGIDAE	Anhinga anhinga	anhinga; snakebird; water

turkey

APODIDAE	Chaetura pelagica	chimney swift
ARDEIDAE	Ardea herodias	great blue heron
ARDEIDAE	Botaurus lentiginosus	American bittern
ARDEIDAE	*Bubulcus ibis	cattle egret
ARDEIDAE	Butorides striatus	green-backed heron
ARDEIDAE	Casmerodius albus S4 (FNAI)	great egret
ARDEIDAE	Egretta caerulea SSC (FGFWFC); S4 (FNAI)	little blue heron
ARDEIDAE	Egretta thula SSC (FGFWFC); S4 (FNAI)	snowy egret
ARDEIDAE	Egretta tricolor SSC (FGFWFC); S4 (FNAI)	tricolored heron; Louisiana heron
ARDEIDAE	Ixobrychus exilis S4 (FNAI)	least bittern
ARDEIDAE	Nycticorax nycticorax S3? (FNAI)	black-crowned night heron
ARDEIDAE	Nycticorax violaceus	yellow-crowned night heron
BOMBYCILLIDAE	Bombycilla cedrorum	cedar waxwing
CAPRIMULGIDAE	Caprimulgus carolinensis	chuck-will's-widow
CAPRIMULGIDAE	Chordeiles minor	common nighthawk
CATHARTIDAE	Cathartes aura	turkey vulture
CATHARTIDAE	Coragyps atratus	black vulture

BIRDS (CONT'D)

FAMILY	SCIENTIFIC NAME	COMMON NAME(S)
CHARADRIIDAE	Charadrius vociferus	killdeer
CICONIIDAE	Mycteria americana E (FGFWFC); E (USFWS); S2 (FNAI)	wood stork
COLUMBIDAE	Columbina passerina	common ground dove
COLUMBIDAE	Zenaida macroura	mourning dove
CORVIDAE	Aphelocoma coerulescens coerulescens T (FGFWFC); T (USFWS); S3 (FNAI)	Florida scrub jay
CORVIDAE	Corvus brachyrhynchos	American crow
CORVIDAE	Corvus ossifragus	fish crow
CORVIDAE	Cyanocitta cristata	blue jay
CUCULIDAE	Coccyzus americanus	yellow-billed cuckoo
EMBERIZIDAE	Agelaius phoeniceus	red-winged blackbird
EMBERIZIDAE	Aimophila aestivalis C2 (USFWS); S? (FNAI)	Bachman's sparrow
EMBERIZIDAE	Cardinalis cardinalis	northern cardinal
EMBERIZIDAE	Chondestes grammacus	lark sparrow
EMBERIZIDAE	Dendroica caerulescens	black-throated blue warbler
EMBERIZIDAE	Dendroica coronata	yellow-rumped warbler
EMBERIZIDAE	Dendroica discolor	prairie warbler
EMBERIZIDAE	Dendroica dominica	yellow-throated warbler
EMBERIZIDAE	Dendroica magnolia	magnolia warbler
EMBERIZIDAE	Dendroica palmarum	palm warbler
EMBERIZIDAE	Dendroica petechia	yellow warbler
EMBERIZIDAE	Dendroica pinus	pine warbler
EMBERIZIDAE	Dendroica striata	blackpoll warbler

EMBERIZIDAE	Dendroica tigrina	Cape May warbler
EMBERIZIDAE	Geothlypis trichas	common yellowthroat
EMBERIZIDAE	Melospiza georgiana	swamp sparrow
EMBERIZIDAE	Melospiza melodia	song sparrow
EMBERIZIDAE	Mniotilta varia	black-and-white warbler
EMBERIZIDAE	Parula americana	northern parula
EMBERIZIDAE	Passerculus sandwichensis	savannah sparrow
EMBERIZIDAE	Pipilo erythrophthalmus	rufous-sided towhee
EMBERIZIDAE	Piranga rubra	summer tanager
EMBERIZIDAE	Protonotaria citrea	prothonotary warbler
EMBERIZIDAE	Quiscalus major	boat-tailed grackle

BIRDS (CONT'D)

FAMILY	SCIENTIFIC NAME	COMMON NAME(S)
EMBERIZIDAE	Quiscalus quiscula	common grackle
EMBERIZIDAE	Seiurus motacilla S3	Louisiana waterthrush (FNAI)
EMBERIZIDAE	Seiurus noveboracensis	northern waterthrush
EMBERIZIDAE	Sturnella magna	eastern meadowlark
FALCONIDAE	Falco sparverius	American kestrel
GRUIDAE	Grus canadensis pratensis T (FGFWFC); II (CITES); S2S3 (FNAI)	Florida sandhill crane
HIRUNDINIDAE	Hirundo rustica	barn swallow
HIRUNDINIDAE	Progne subis	purple martin
HIRUNDINIDAE	Tachycineta bicolor	tree swallow
LANIIDAE	Lanius ludovicianus	loggerhead shrike
LARIDAE	Larus delawarensis	ring-billed

gull		
MIMIDAE	Dumetella carolinensis	gray catbird
MIMIDAE	Mimus polyglottos	northern mockingbird
MIMIDAE	Toxostoma rufum	brown thrasher
MOTACILLIDAE	Anthus spinoletta	water pipit
MUSCICAPIDAE	Polyoptila caerulea	blue-gray gnatcatcher
MUSCICAPIDAE	Regulus calendula	ruby-crowned kinglet
MUSCICAPIDAE	Sialia sialis	eastern bluebird
MUSCICAPIDAE	Turdus migratorius	American robin
PARIDAE	Parus bicolor	tufted titmouse
PHALACROCORACIDAE	Phalacrocorax auritus	double-crested cormorant
PHASIANIDAE	Colinus virginianus	northern bobwhite
PHASIANIDAE	Meleagris gallopavo	wild turkey
PICIDAE	Colaptes auratus	northern flicker
PICIDAE	Dryocopus pileatus	pileated woodpecker
PICIDAE	Melanerpes carolinus	red-bellied woodpecker
PICIDAE	Picoides pubescens	downy woodpecker
PICIDAE	Picoides villosus	hairy woodpecker

S3? (FNAI)

BIRDS (CONT'D)

FAMILY	SCIENTIFIC NAME	COMMON NAME(S)

PICIDAE	Sphyrapicus varius	yellow-bellied sapsucker
PODICIPEDIDAE	Podilymbus podiceps	pied-billed grebe
RALLIDAE	Gallinula chloropus	common moorhen
RALLIDAE	Rallus limicola	Virginia rail
RECURVIROSTRIDAE	Himantopus mexicanus	black-necked stilt
SCOLOPACIDAE	Actitis macularia	spotted sandpiper
SCOLOPACIDAE	Gallinago gallinago	common snipe
SCOLOPACIDAE	Tringa flavipes	lesser yellowlegs
SCOLOPACIDAE	Tringa melanoleuca	greater yellowlegs
SCOLOPACIDAE	Tringa solitaria	solitary sandpiper
STRIGIDAE	Athene cunicularia floridana SSC (FGFWFC); S3 (FNAI)	burrowing owl
STRIGIDAE	Bubo virginianus	great horned owl
STRIGIDAE	Strix varia	barred owl
STURNIDAE	*Sturnus vulgaris	European starling
THRESKIORNITHIDAE	Ajaia ajaja SSC (FGFWFC); S2S3 (FNAI)	roseate spoonbill
THRESKIORNITHIDAE	Eudocimus albus S4 (FNAI)	white ibis
THRESKIORNITHIDAE	Plegadus falcinellus S2 (FNAI)	glossy ibis
TROGLODYTIDAE	Cistothorus palustris	marsh wren
TROGLODYTIDAE	Cistothorus platensis	sedge wren
TROGLODYTIDAE	Thryothorus lucovicianus	Carolina wren
TROGLODYTIDAE	Troglodytes aedon	house wren
TYRANNIDAE	Empidonax virescens	Acadian flycatcher

TYRANNIDAE	Myiarchus crinitus	great crested flycatcher
TYRANNIDAE	Sayornis phoebe	eastern phoebe
TYRANNIDAE	Tyrannus tyrannus	eastern kingbird
VIREONIDAE	Vireo griseus	white-eyed vireo
VIREONIDAE	Vireo olivaceus	red-eyed vireo

MAMMALS

FAMILY	SCIENTIFIC NAME	COMMON NAME(S)
CERVIDAE	Odocoileus virginianus	white-tailed deer
CRICETIDAE	Neofiber alleni C2 (USFWS); S3? (FNAI)	round-tailed muskrat
CRICETIDAE	Neotoma floridana	eastern woodrat
CRICETIDAE	Oryzomys palustris	marsh rice rat
CRICETIDAE	Peromyscus gossypinus	cotton mouse
CRICETIDAE	Sigmodon hispidus	hispid cotton rat
DASYPODIDAE	*Dasypus novemcinctus	nine-banded armadillo
DIDELPHIDAE	Didelphis virginiana	Virginia opossum
FELIDAE	Lynx rufus II (CITES)	bobcat
LEPORIDAE	Sylvilagus floridanus	eastern cottontail
LEPORIDAE	Sylvilagus palustris	marsh rabbit
MUSTELIDAE	Lutra canadensis II (CITES)	river otter
PROCYONIDAE	Procyon lotor	raccoon

SCIURIDAE	Glaucomys volans	southern flying squirrel
SCIURIDAE	Sciurus carolinensis	gray squirrel
SORICIDAE	Blarina carolinensis	southern short-tailed shrew
SUIDAE	*Sus scrofa	feral hog; wild pig
TALPIDAE	Scalopus aquaticus	eastern mole
TRICHECHIDAE	Trichechus manatus	Florida manatee; West Indian manatee

E (FGFWFC); E (USFWS); I (CITES); S2? (FNAI)

LEGEND

See page 64

Compiled by J. Weber
06-01-94

APPENDIX J

Descriptions of DESIGNATED ANIMALS found on the T. Mabry Carlton, Jr. Memorial Reserve, Sarasota County, FL

American alligator
(Alligator mississippiensis)

The alligator is a large predatory reptile found in many of Florida's rivers, lakes, swamps, marshes and other freshwater habitats. On the Reserve, alligators most commonly occur in riverine habitats along both the Myakka River and Deer Prairie Slough and in many of the depression marshes which are scattered throughout the area.

Alligators feed on a wide variety of prey, including wading birds, turtles, frogs, fish, smaller alligators and mammal species associated with wetland areas, such as deer and feral hogs. Shoreline areas along the Myakka River provide denning sites and the marshes and isolated wetlands are prime nesting sites.

Management for alligators will require maintaining wetland areas in their natural state, and will require preserving the Myakka River shoreline area in its natural condition.

Eastern indigo snake
(Drymarchon corais couperi)

The indigo snake is a frequent inhabitant of pine flatwoods and hardwood hammocks. Both habitat loss and illegal harvesting are the primary reasons this species has been designated as "threatened." Also, declines in the gopher tortoise population, whose burrows are often used as "dens" by indigo snakes, have adversely impacted indigo snake populations.

Management for the indigo snake will consist of maintaining the hammocks along the Myakka River and restoring the pine flatwoods areas within the Reserve through the proper application of periodic prescribed fire. Since indigo snake populations appear to be closely tied to gopher tortoise populations, management activities benefitting gopher tortoises should also benefit indigo

snakes.

Florida scrub jay
(Aphelocoma coerulescens coerulescens)

The Florida scrub jay is a disjunct sub-population of the scrub jay species inhabiting the western United States and Mexico. The Florida population is physically and behaviorally unique and is restricted to isolated patches of scrub habitat in the peninsular area of our state. On the Reserve, Florida scrub jays have been observed infrequently in areas north of S.R. 72, though the closest scrub habitat known to occur in the vicinity is located more than 5 miles to the northwest in Myakka River State Park.

Suitable scrub jay habitat consists of shrubby oak thickets interspersed with scattered pine trees and open sandy areas. To date, no large areas (over 10 acres in size) of suitable scrub habitat have been identified on the vegetation map for the Carlton Reserve (Appendix C). However, the Reserve's soil map (Attachment A) shows a small area of Pomello fine sand near the present entrance which may be restored to suitable scrubby flatwoods habitat by burning. Other isolated patches of scrubby flatwoods occur in a general north-south orientation along a ridge just to the east of the Myakka River. In all, it is estimated that less than 1% of the Reserve's total acreage is potentially suitable for scrub jays. However, their temporary use of the property and nesting on adjacent properties suggests that the Carlton Reserve might serve as an important dispersal corridor for this species.

Prescribed burning will be used to restore and maintain the Reserve's pineland habitats and should help to keep the vegetation in suitable scrub jay habitats open and low in height. It is not known whether sufficient habitat exists to support nesting jays on the property.

Arctic peregrine falcon
(Falco peregrinus tundrius)

The peregrine falcon subspecies that inhabits the North American Arctic spends the winter months (generally October to April) in Florida. Preying primarily on small bird species, these falcons prefer areas where good perching sites are plentiful. Proper management of habitats to attract small birds and maintain

suitable perching sites should benefit migrating falcons using the area.

Florida panther
(Felis concolor coryi)

In recent years, there has been a number of unconfirmed Florida panther sightings on what is now the Reserve. Though a reproducing population of panthers is unlikely in this region, it is possible that individuals may infrequently traverse the property in search of prey or a mate. Panthers historically inhabited a wide variety of habitats throughout the state and almost certainly did occur previously on the Reserve. Adult panthers require home ranges of up to 400 square miles and may roam as much as 15 to 20 miles in a single day in search of food, shelter or potential mates. They feed primarily on deer, feral hogs, raccoons, and opossums. As development claims more and more of our natural areas, large public lands, such as the Reserve, will become increasingly important havens for wildlife.

Encouragement of a healthy deer population, through continued fire management, could make the area more suitable as potential panther habitat. Acquisition of adjoining property through the use of fee simple acquisition and conservation easements may also be helpful. Where this is not possible, joint management plans between government agencies and private landowners may be another option.

Florida sandhill crane
(Grus canadensis pratensis)

The Florida sandhill crane is a non-migratory subspecies of the sandhill crane and prefers open, shallow marshes, sloughs and prairies. Optimal nesting habitat usually contains abundant pickerelweed (Pontederia cordata), maidencane (Panicum hemitomon) and Sagittarias (Sagittaria spp.). Unfortunately, attempts to nest successfully can be hampered by extremely dry conditions during the late winter nesting period. Even under optimal conditions, reproductive potential is generally low in this species.

Restoration of the Reserve's marshes, sloughs, isolated wetlands and prairies, along with maintenance of proper hydroperiods, will enhance existing sandhill crane habitat. Once restoration has

begun, lightning-season prescribed burns, scheduled to approximate natural intervals, should help control the invasion of woody species in these areas.

Bald eagle
(Haliaeetus leucocephalus)

The bald eagle is a large raptor, once widespread in Florida. Eagles are most often associated with rivers, lakes or marshes which are favorite feeding areas. Bald eagles are opportunistic feeders, taking both live prey and carrion. Nests are most often constructed in tall, mature pines (generally in living pines, but occasionally in dead pines) either near wetland areas or in open flatwoods. In recent years, continued loss of habitat has resulted in declining eagle populations.

To manage for eagles specific to the Reserve, dry prairies, wetlands and flatwoods will be restored/maintained with periodic prescribed fire. If nest trees are located, protection from high intensity fires that could result in tree death is desirable. However, if nearby vegetation can be burned without posing a significant threat to the nest tree, then occasional fires are preferred.

Florida weasel
(Mustela frenata peninsulae)

The Florida weasel is a subspecies of the American weasel. It is found in central Florida south of a line extending from Volusia County westward to Citrus County County and north of a line extending from Brevard County to Collier County. In appearance, the Florida weasel looks much like the American weasel. Florida weasels, unlike their northern counterparts, do not molt into white winter pelage. There is noticable dimorphism in this species with males generally larger than females.

By their very nature, weasels are extremely secretive and very little is known about this Florida subspecies. Though no confirmed sightings have been noted for the Carlton Reserve, the Myakka River basin is thought to harbor a small weasel population. Weasels have been noted in Myakka River State Park and are listed on the park's vertebrate list (DNR, 1986).

Management needs for this species appear to include maintenance of a diverse habitat assemblage and long-term preservation of large tracts of land which are necessary to accomodate this animal's large home range.

Wood stork
(Mycteria americana)

The wood stork is the only New World stork species and is most commonly found near freshwater wetlands or in mangrove swamps. Feeding is restricted almost entirely to shallow freshwater wetlands where fish are concentrated during periods of declining water levels. Their feeding technique requires that a high biomass of fish be available, especially to support nesting activities. For this reason, storks are very sensitive to changes in hydroperiods.

Management of the Reserve's marshes to maintain natural hydroperiods and water levels will be necessary to manage for wood storks.

Audubon's crested caracara
(Polyborus plancus audubonii)

In Florida, the caracara is most often found in the native, open range lands and dry prairies of the central and south-central areas of the state. They inhabit grassy prairies with scattered cabbage palms (Sabal palmetto) that serve as perching and nesting sites. Large scale destruction of native dry prairie habitats for development or agricultural use is thought to be the main reason for declines in the caracara population.

To manage for caracaras, dry prairie habitats must be maintained as open, expansive grassy areas free of extensive hardwood invasion. Lightning-season prescribed fires, set at natural intervals, will be necessary to maintain these areas in this condition. Restoration of improved and semi-improved pastures to dry prairie habitat, where it formerly occurred, will be required.

Red-cockaded woodpecker
(Picoides borealis)

Though red-cockaded woodpeckers have not been reported on the

Reserve, or elsewhere in Sarasota County, they do inhabit similar pineland habitats throughout the southeastern United States. Significant colonies are known to occur in nearby Charlotte and Collier Counties. These small woodpeckers generally construct nests in mature pines afflicted with heart rot disease. While longleaf pine (Pinus palustris) stands are preferred, nest cavities in Southwest Florida are often found in South Florida slash pine (Pinus elliottii var. densa) due to the scarcity of longleaf pines in our region. Red-cockaded woodpeckers prefer open, mature pine forests with a sparse understory. In suitable areas, more than one pair often colonize the same stand of trees and usually will continue to utilize the same nest cavities as long as proper habitat conditions exist.

Managing for red-cockaded woodpeckers will involve maintaining older pine stands in an open, healthy condition through the use of periodic low-intensity fires at two to five year intervals. Suitable pineland habitats will also need to be monitored to insure sufficient pine regeneration to replace old trees as they die.

Florida black bear
(Ursus americanus floridanus)

According to Jim Beever, of the Florida Game and Freshwater Fish Commission's Office of Environmental Services, Florida black bears use the riparian corridor along the Myakka River. Although none have been recorded for the Reserve in recent years, unconfirmed tracks have been seen. Bears have very large home ranges and travel great distances in search of food, shelter and potential mates. They are omnivores, though a large portion of their diet consists of cabbage palm (Sabal palmetto) buds, saw palmetto (Serenoa repens) berries, acorns and various other fruits and berries.

Management for this species will require protection of the riparian hammocks along the Myakka River and proper fire management of fire-dependent natural communities.

APPENDIX K

CULTURAL RESOURCE SENSITIVITY MAP

(Refer to actual document)