South Florida Water Management District
Land Stewardship Division
Save Our Rivers Program

Lower Reedy Creek Management Area Five-Year General Management Plan (2002 – 2007)

April 2002

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Land Stewardship Department
South Florida Water Management District
3301 Gun Club Road
West Palm Beach, Florida 33416-4680

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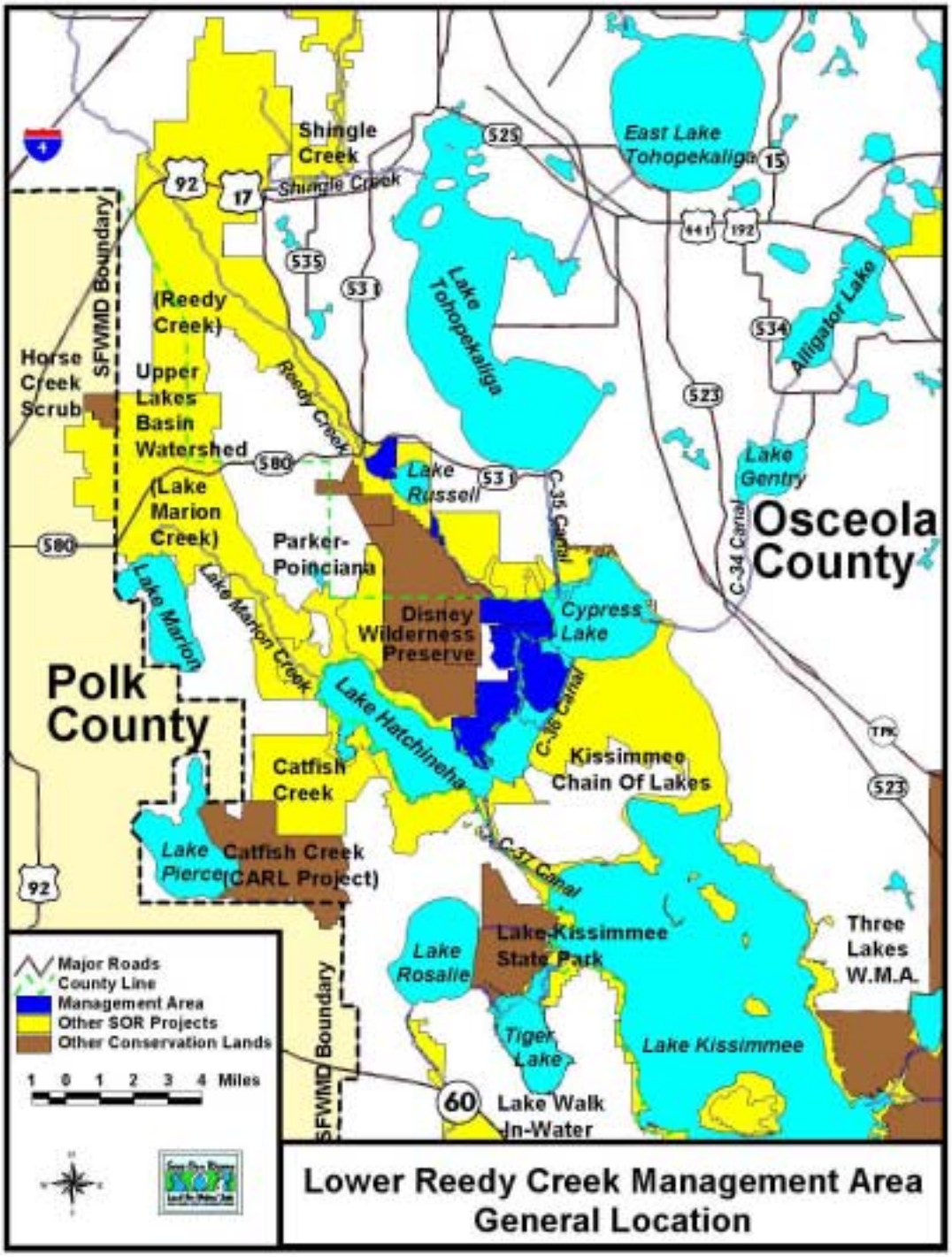
Acronyms

AWP	Annual Work Plan
CWA	Clean Water Act
FCREPA	Florida Committee on Rare and Endangered Plants and Animals
FDHR	Florida Division of Historical Resources
FDOF	Florida Division of Forestry
FDEP	Florida Department of Environmental Protection
FWC	Florida Fish and Wildlife Conservation Commission
FNAI	Florida Natural Areas Inventory
GMP	General Management Plan
GOAA	Greater Orlando Aviation Authority
KRRP	Kissimmee River Restoration Project
KRREP	Kissimmee River Restoration Evaluation Program
LRCMA	Lower Reedy Creek Management Area
LSP	Land Stewardship Program (SFWMD)
NGVD	National Geodetic Vertical Datum
NSLP	Natural Soil Landscape Positions
OFW	Outstanding Florida Waters
ONRW	Outstanding Natural Resource Waters
PBS&J	Post, Buckley, Schuh & Jernigan, Inc.
SFWMD	South Florida Water Management District
SOR	Save Our Rivers Program (SFWMD)
TNC	The Nature Conservancy
USFWS	United States Fish and Wildlife Service
WMA	Wildlife Management Area (FWC)

Map 1: Lower Reedy Creek Management Area



1. Executive Summary

Executive Summary

Project Description and Background

Reedy Creek is a seasonally fluctuating blackwater stream that connects Lake Russell to Cypress Lake and Lake Hatchineha. With headwaters in Lake County, it runs south through Orange, Osceola, and Polk counties for approximately 25 miles. Reedy Creek remains unchannelized and meanders through a floodplain swamp forest dominated by bald cypress, red maple, and strangler fig. The Reedy Creek watershed provides a range of habitat types that support a diversity of species. While floodplain swamp is the dominant community, 13 additional communities are also present in the management area, including dry prairie, mesic flatwoods, and scrub that form a valuable biological resource.

The portion of the creek covered by this management plan, known as Lower Reedy Creek Management Area (LRCMA), from Lake Russell to Lakes Hatchineha and Cypress, encompasses approximately seven miles of creek corridor and 9,000 acres of wetlands and uplands. This management unit falls within two Save Our Rivers projects—Reedy Creek and Kissimmee Chain of Lakes. SFWMD ownership within the management unit totals approximately 5,600 acres. The creek is navigable when water levels are sufficiently high.

The use of Reedy Creek by wildlife fluctuates with the seasons and changing water levels. During the winter and spring, water flow in Reedy Creek slows due to low amounts of rainfall, and may dry up in certain areas, as it did in 1999. When summer rains begin, the creek swells, rising to depths greater than four feet. Water control structures placed at the headwaters of the creek (by the Reedy Creek Improvement District) may manipulate downstream hydroperiods, altering water levels and natural flow (Richardson et al. 1996). The south end of Reedy Creek diverges into two channels; Reedy Creek flows into Cypress Lake and the Dead River flows into Lake Hatchineha.

Resource inventories have been conducted to determine the natural and cultural resources present. In addition, the Florida Fish and Wildlife Conservation Commission (FWC) has identified the area in and around the LRCMA as a “Strategic Habitat Conservation Area,” a “Biodiversity Hotspot,” and a “Priority Wetland for Listed Species.”

Uplands to the east of the creek support nesting and breeding sites for numerous bird species, and provide habitat for wild game such as turkeys, feral pigs, and white-tailed deer. Wood storks, a federally endangered species, return annually to the creek for breeding and nesting. Buffer zones are used by the District to protect wood storks from human activity. Similarly, bald eagles, a threatened species, are protected by regulations that create buffers between eagle nests and human activities. Regulations restricting nighttime activities were also established to protect southeastern big-eared bats that inhabit the area.

Purpose and Administrative Management

This general management plan (GMP) is based on present conditions and best management practices suitable for the Save Our Rivers (SOR) properties within the Lower Reedy Creek Management Area. (Map 1). The plan fulfills the requirements of the Save Our Rivers legislation, South Florida Water Management District policy, and a lease with the Florida Department of Environmental Protection (FDEP) regarding management of sovereign submerged lands.

The purpose of the GMP is to consolidate site information and establish guidelines for management of District-owned lands within the LRCMA from 2002 through 2007 and describes the District-managed lands as shown on Map 2.

Administrative management of LRCMA is primarily coordinated out of the District's Orlando Service Center with assistance from staff in West Palm Beach and other regional offices. Administrative functions consist of funding, planning, reporting, and coordinating with external agencies. As part of these duties, this GMP will be updated and revised every five years and will be implemented through activity plans, annual work plans, and budgets.

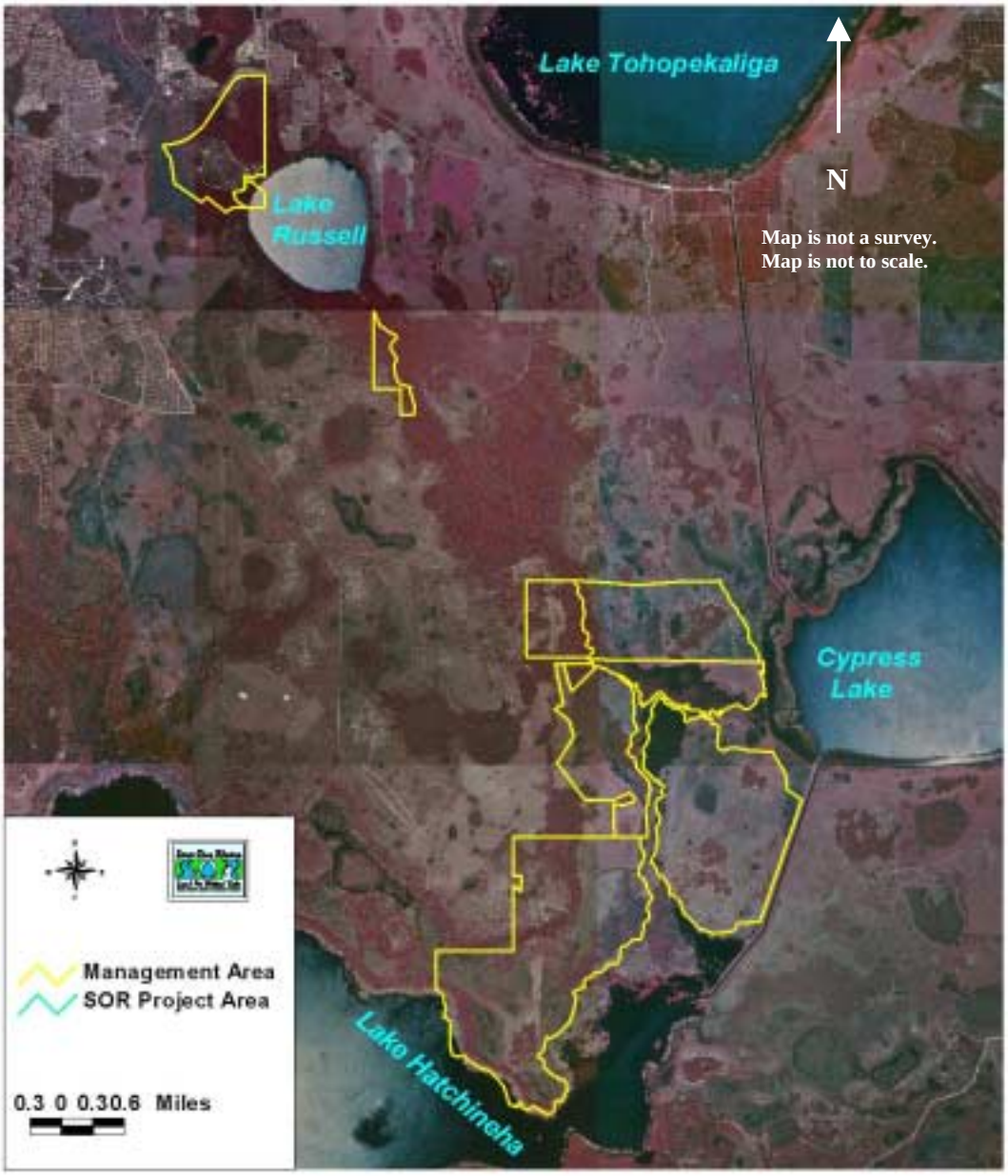
Program-wide land management goals:

- Conserve and protect water resources and supplies
- Protect and restore the land in its natural state and condition
- Provide compatible public use opportunities
- Provide cost-effective resource protection

LRCMA Management Objectives 2002-2007

- Provide opportunities for resource-compatible public use and environmental education
- Seek long-term solution to the public use debate in cooperation with all stakeholders. The debate involves protection of sensitive natural resources versus airboating and hunting rights
- Provide multiple-use opportunities, including grazing and forest management, as compatible with SOR program goals
- Protect listed plant and animal species
- Protect and restore the land in its natural state and condition by controlling nuisance and exotic vegetation and the use of prescribed fire
- Ensure compliance with established resource protection rules

Map 2: Digital Remote Imagery of the Lower Reedy Creek Management Area



Lower Reedy Creek Management Area
(With Digital Orthophotographic Quarter Quadrangle)

2. Scope of General Management Plan

This general management plan is based on present conditions and best management practices suitable for the LSP-managed properties within the Lower Reedy Creek Management Area from March 2002 through March 2007. The GMP is scheduled for review and revision every five years by the SFWMD.

3. Management Plan Purpose

Florida Statutes 373.59 and 259.101 and District Policy #05.00117.2 require GMPs be developed for each designated SOR project. The District's lease (#4099) with FDEP, for the management of lands below the Ordinary High Water Level, also requires that a management plan be written for those lands at the southern terminus of Reedy Creek. This plan fulfills the statute, policy, and lease requirements for the LRCMA.

By definition (see Section 4), this GMP describes a level of management for the Lower Reedy Creek Management area which is "responsible" and which the District will strive to achieve. The plan consolidates current site information and general guidelines for management of the area. It also updates and replaces the Conceptual Management Plan - Lake Marion Creek and Reedy Creek Units (SFWMD 1992). As such, it serves as a collective information source for management staff, partners, and the general public.

4. Definitions

Adaptive Management – a cyclical process in which inventories document resource presence, management actions are applied, and monitoring and research activities evaluate the effectiveness of those actions; management actions are then revised and applied again.

Archaeological / Historic Resources - any prehistoric or historic district, site, building, object, or property of historic, architectural, or archaeological value relating to the history, government, and/or culture of a historic or pre-historic people.

Best Management Practices - the best available technology or process that is practical and achieves the desired goal or objective.

Cooperating Agencies - two or more agencies working together to operate a specific management area.

Cooperative Management Agreement - an agreement between two or more agencies outlining the respective duties and responsibilities of each agency in the management of a specific tract of land.

Easement - an interest in the land of another that provides the easement holder specified rights without fee-title ownership.

Endemic - native to, and restricted to, a particular geographic region

Enhancement - modification of select physical attributes of a natural community to improve ecosystem function.

Exotic - an organism whose origin is of another continent.

Lease - a legal agreement that defines rights and responsibilities for use of land owned by another party.

Listed Species - species considered at risk (species of special concern, threatened, or endangered) within a specific geographic area by the USFWS and the FWC.

Maintenance - work performed to preserve property conditions on a regular basis.

Management - planned control and manipulation of factors affecting property conditions.

Management Area - a single tract or combination of tracts under one management program.

Management Assessment - a brief summary of the management issues completed when the site is identified for acquisition.

Mitigation Banking - wetland acquisition, creation, restoration, or enhancement undertaken expressly to provide compensation in advance of wetland losses from development activities.

Multiple-Use - the management of renewable resources for a variety of purposes such as recreation, range, timber, wildlife habitat, and water resource development.

Native Species - species considered indigenous to the North American continent prior to European settlement.

Natural Community - a distinct and reoccurring assemblage of plant and animal populations naturally associated with each other and their physical environment.

Prescribed Fire - application of fire to natural communities according to a written prescription; the prescription executed with a defined goal and under specific environmental and physical parameters.

Regional Mitigation Area - Permitted wetland impacts offset through payment for the acquisition, restoration, enhancement, and perpetual management of a Save Our Rivers-identified and duly noticed project.

Reservation - a legal agreement between a property seller and buyer that defines the seller's rights and responsibilities of post-sale property use

Responsible Management - that level of management described in the General Management Plan (GMP).

Restoration - re-creation of physical attributes of a natural system with the intent to return original ecological function.

Sustainable Use - to provide continued use of a natural resource without long-term degradation or loss of that resource

5. LSP Goals and Policies

05.0011 The LSP mission is to provide natural resource protection and management while allowing appropriate recreational use on desinated public lands.

05.00102 This policy shall apply to all lands managed by the LSP, Presrvation 2000, Florida Forever or mitigation funding. This policy will be reviewed and approved by the district Governing Board at five (5) year intervals or earlier, and updated as required. Public comment will be solicited as part of the review process.

The Mission Statement together with requirements set forth in the Florida Statutes 373-139 and 373.1391, provide three primary goals for the District LSP, each of which is linked to a section in the Land Management Policy document.

Goals

- *Conserve and protect water resources.*
- *Protect and/or restore land to its natural state and condition.*
- *Provide public use.*

05.00102 - This policy shall apply to all lands managed by the Land Stewardship Program, Preservation 2000, Florida Forever or mitigation funding. This policy will be reviewed and approved by the District Governing Board at five (5) year intervals or earlier, and updated as required. Public comment will be solicited as part of the review process.

Water resource lands designated as necessary to implement the Central and Southern Florida "Restudy" Project, shall upon acquisition become the responsibility of the (Interim) Land Management Program, and follow the guidelines set forth under Section 373.1391(5) F.S. and HB 1119.

05.0011 - The Land Stewardship Program mission is to provide natural resource protection and management while allowing appropriate recreational use on designated public lands.

05.00111 - The basis for the Land Stewardship Program is the protection and management of natural hydrologic resources.

05.00111.1 - Acquired lands shall be managed to provide water resource related benefits.

05.00111.3 - Where feasible, an attempt shall be made to restore a more natural hydroperiod on tracts where the drainage patterns have been altered.

05.00111.4 - Public use shall not result in detrimental impacts to water resources. When a public use activity produces detrimental effects on water resources, it shall be discontinued until an evaluation determines that such use is compatible.

05.00111.5 - Water resource lands designated as necessary to implement the Central and Southern Florida "Restudy" Project, shall upon acquisition, become the responsibility of the (Interim) Land Stewardship Program and follow the guidelines set forth under Section 373.1391(5) F.S.S. and H.B. 1119.

05.00112.1 - The Land Stewardship Program will encourage the acquisition of large or regionally significant areas that protect important natural resources and provide wildlife corridors.

05.00112.2 - Particular emphasis shall be placed on the identification, protection and management of rare, threatened, and endangered species.

05.00112.3 - Planting of exotic/invasive plant species shall be prohibited in all management areas. Management practices will strive to identify existing infestations and implement appropriate control or eradication measures.

05.00112.4 - Where practicable, an attempt shall be made to restore and maintain desirable vegetation to promote habitat diversity in areas where exotic/invasive vegetation or improved land uses have substantially altered the historic landscape.

05.00113c - Legislative-mandated (H.B. 1119) management review will provide input from professional peers.

05.00113.1 - Lands acquired for natural and /or hydrologic resource benefits shall be managed to conserve and protect those resources.

05.00113.10 Archaeological and historical resources are protected by site identification and inter-agency coordination with the Department of Historical Resources. Land management planning shall include an analysis of archaeological data accompanied by appropriate public education opportunities.

05.00113.12 - Mechanical equipment may be used in conjunction with prescribed burning and other management tools to control vegetation and restore habitat structure.

05.00113.2 - Exotic plant control in all management areas shall attain a level of success where periodic maintenance eliminates the infestation or reduces the spread of exotic plants.

05.00113.3 - Prescribed fire will be a primary management tool on District lands and will be applied within fire maintained communities at appropriate intervals.
05.00113.4 - The Division of Forestry will be notified of all wildfires on District lands. The Land Stewardship Program will provide initial suppression when commensurate personnel and equipment are available.

05.00113.6 - Evaluation and monitoring of management activities shall be conducted to improve program effectiveness and efficiency.

05.00113.6 - Inventories of natural and historic resources shall be performed to provide information for effective land management planning, natural community maintenance, and ecological restoration.

05.00113.6a - Research shall evaluate the environmental response of certain management activities to assist staff in making appropriate management decisions.

05.00113.6b - Monitoring shall be conducted to identify landscape changes resulting from management activities.

05.00113.6c - Timber sales will be conducted to improve forest health or support specific forest management goals.

05.00113.6d - Grazing leases will be encouraged on selected range land to generate revenue or to provide services that offset program management costs.

05.00113.7 - Security and resource protection shall be provided by professional law enforcement services through contractual and non-contractual agreements, to safeguard the public and protect natural and cultural resources on District-managed natural areas.

05.00113.8 - Sustainable use of forest resources shall be conducted where these activities adhere to a series of environmental criteria that meet Land Stewardship Program goals. Timber contractors will be required to meet silvicultural best management practices developed for Florida forests.

05.00113.9 - Range management and grazing will be considered on improved or native ranges when the introduction of cattle will not conflict with other natural resource management and public use goals.

05.00113.11 - Infrastructure support shall be developed and maintained to provide safe access for responsible management and public use on District lands. Such infrastructure includes access points, roads, trails, utilities, and minimal public facilities.

05.00114.1 - Public use of management areas shall be encouraged that is consistent with other management goals. Public use that may have detrimental impacts on sensitive environmental resources shall be restricted until an evaluation determines such use is compatible. A public use compatibility assessment will be included in the General Management Plan completed for each management area and will be based on the following criteria:

a) **Consistency with the reason the lands were acquired;**

b) **Restrictions and/or prohibitions imposed by easements, leases, reservations, adjacent land ownership, and other conditions of the purchase agreement;**

c) **Infrastructure and support facility requirements, such as fences, gates, signage, entry design, stabilized off-road parking, trails, campsites, maintenance, and other operational and budgetary impacts;**

d) **Opportunities for persons with disabilities;**

e) **Limitations resulting from endangered/threatened/rare species, other sensitive natural resources, archaeological resources, or land management practices;**

f) **Public health, safety and welfare; and**

g) **Environmental education program opportunities.**

05.00114.2a - Public use regulations are set forth in 40E-7.511 F.A.C. to implement Sections 259.101, 373.016(2)(h), and 373.1391(1)(b), F.S. Accordingly, the District publishes and makes available to the public a "Public Use Guide" for designated land management areas. The Public Use Guide will be considered by the Governing Board at a public meeting advertised in accordance with Chapter 120, F.S.S.

05.00114.2b - Rules and regulations governing the public use of each management area shall be enforced by agencies with appropriate law enforcement jurisdiction.

05.00114.2b - Regional Mitigation Areas: The acquisition, restoration and management of District lands as mitigation shall be consistent with Chapter 373.414, F.S.S., and the District's Operational Protocol for Cash Payment as Mitigation. This includes the development of restoration plans to implement the mitigation using full-cost accounting, public noticing, and approval by the Governing Board of the mitigation area. The mitigation shall implement an identified restoration objective, approved by the land manager as developed in a management plan.

05.00114.2c - Pursuant to Section 373.609, F.S.S., it shall be the duty of every state and county attorney, sheriff, police officer, and the appropriate city and county official to assist the District, and their agents, in the enforcement of the provisions set forth according to 40E-7.511 F.A.C.

05.00114.2d - Hunting, in areas opened for such use, is governed by Florida Fish and Wildlife Conservation Commission regulations.

05.00114.4b - Any volunteer services must meet the standards and procedures prescribed by the District (Risk Management Manual Vol. 1).

05.00115 - The District will secure dedicated funding sources, personnel, and other resources to support program goals and objectives. Project funding needs and sources for cooperative management agreements with government and non-government entities will be identified during acquisition. A cooperative management agreement will designate a lead manager and identify whether District funding is required.

05.00115.a - Mitigation banking provides an opportunity to accomplish large-scale restoration that may otherwise go unfunded. Pursuant to Chapter 373.4135, F.S.S., the District was encouraged to develop mitigation banks. Land managers will evaluate opportunities in their regions to implement mitigation banks that are consistent with the guidelines established in the Joint State and Federal Mitigation Bank Review Team Process for Florida.

05.00115.1 - The private sector may be solicited to furnish certain management-related facilities and services through the execution of leases and agreements. These leases/agreements will assure mutual benefits to both the District and private parties and be consistent with the program objectives.

05.00115.3a - Private concessions and/or agreements with non-profit organizations will be considered to implement needed services through concession contracts.

05.00115.33b - Entrance and user fees, permits, licenses and/or advance reservations may be required for use of District lands where considered necessary by the managing agency.

05.00115.4a - Volunteers, interns, and alternative work forces will be used when possible to supplement existing staff and services.

05.001157.5 Reporting - Summaries of management activities for each management area will be reported quarterly within the District and annually as part of the Florida Forever Work Plan.

05.00117.2 - General management plans provide a description of recommended management and is required for each Land Stewardship/Save Our Rivers Management Area. The general management plan follows a designated format and is updated every five years.

05.00117.3 - Activity plans provide a detailed implementation strategy for specific activities such as prescribed burning, exotic removal, and restoration. The plan shall be developed by the lead manager in consultation with the cooperating agencies for each major tract of land (or groups of tracts) to be operated as a single management unit.

Activity plans may be included in the general management plans and are updated when necessary.

05.00117.4 - Annual work plans summarize activities corresponding with annual budget development and are prepared by the Operations Section of the Land Stewardship Program.

6. Management and Development Programs

Policy 05.00111.1 - Acquired lands shall be managed to provide water resource related benefits.

Policy 05.00112.1 - The Land Stewardship Program will encourage the acquisition of large or regionally significant areas that protect important natural resources and provide wildlife corridors.

Policy 05.00113.1 - Lands acquired for natural and /or hydrologic resource benefits shall be managed to conserve and protect those resources.

6.1 Resource Preservation and Improvement

In 1981, the Florida Legislature established the SOR Program for the five water management districts, directing them to acquire environmentally sensitive land. The legislation (373.59, F.S.) produced the Water Management Lands Trust empowering the water management districts to acquire fee title (or other interest) in lands needed to manage, protect, and conserve the state's water resources. The term "other interests" implies that natural resource benefits may, in appropriate cases, be protected and retained by securing conservation, flowage or public access easements, or mitigation acquisition as an alternative to purchasing by fee-title. In 1988, the District began a program to identify lands within its 16-county jurisdiction that might be suitable for consideration. The agency reviews SOR applications from private and public groups, and other sites based on the District's strategic planning needs. The value of each parcel is evaluated using a natural resource-based matrix, project benefit criteria, and SOR Selection Criteria for Water Resource Projects, with consideration for projected land use (SFWMD 1998).

Preservation 2000, enacted by the Legislature in 1990, also added land acquisition funds to the SOR Program. The 1999 Florida Forever Act consolidated the legislative directives of SOR/P2000 and expanded the funding to continue after P2000 terminates. Acquisition of fee-title (or some lesser) interest in land provides the opportunity for direct, long-term involvement with the development and management of the area. The following acquisition policies apply to all Land Stewardship-managed properties.

The SFWMD holds fee title to and manages more than 400,000 acres of land throughout 16 counties. As steward of District lands, the LSP provides natural resource protection and management while allowing compatible recreational use. Management and use of lands

acquired by the District under SOR and Preservation 2000 must satisfy requirements set forth in Florida State Statutes Section 373.59.

6.1.1 LRCMA Management Objectives

- Florida statutes and SFWMD goals and policies (5.) provide the framework for the creation of the GMP. Throughout the GMP, numerous management objectives are given for the LRCMA. A summary of the objectives is given here.
- Protect lands within the LRCMA that are necessary for the successful completion of the Kissimmee River Restoration Project.
- Protect lands within the LRCMA that are important hydrologic components of the headwaters of the Kissimmee River.
- Protect lands within the LRCMA that have listed, rare, or sensitive species and/or habitats (including corridors) within them.
- Protect lands within the LRCMA that will improve the effectiveness and efficiency of the area's management.
- Utilize wetland creation techniques within the LRCMA to offset regional ecological deficiencies.
- Utilize wetland restoration techniques to improve hydrologic functions within the LRCMA.
- Utilize wetland enhancement techniques to improve hydrologic functions within the LRCMA.
- Document biological species and ecological communities within the LRCMA.
- Identify the type, locations, and habitat needs of wildlife species found within the LRCMA.
- Identify archeological sites and historical structures located within the LRCMA.
- Track activities of nesting wood storks within the LRCMA.
- Track activities of nesting bald eagles within the LRCMA.
- Monitor population levels of Southeastern big-eared bats within the LRCMA.
- Monitor the hydro-geomorphology and creek obstructions within the LRCMA.
- Utilize a comprehensive monitoring program in the LRCMA to enable management evaluation.
- Implement research to test hypotheses leading to improved management of and regulations for the LRCMA.
- Utilize external reviews to evaluate management programs, activities, and results within the LRCMA.
- Ensure future agricultural activities within the LRCMA are consistent with District policies, goals, and guidelines.
- Protect archeological sites and historical structures located within the LRCMA.
- Maintain vegetative communities under natural fire regimes within the LRCMA.
- Use prescribed fire to restore and maintain the natural state and condition of the communities on Rough Island, Johnson Island, and Lake Russell Management Units.

- Control the invasion of woody plants (especially wax myrtles), encourage native plant and herb recruitment, and maintain plant community diversity.
- Burn all scrub units at least once and the mesic flatwoods units for a second time by 2005.
- Implement safe prescribed fire operations.
- Safeguard District property, private property, and the public--in and around the LRCMA from wildfires.
- Ensure future forestry operations within the LRCMA are consistent with District policies, goals, and guidelines.
- Implement range management programs within the LRCMA that do not negatively affect ecological conditions and/or functions of the area.
- Safeguard the public, wildlife, and environment from negative factors associated with cattle dips within the LRCMA.
- Ensure future mining operations within the LRCMA are consistent with District policies, goals, and guidelines.
- Protect and perpetuate listed plant species within the LRCMA.
- Reduce the presence, spread, and associated negative effects of exotic and invasive plant species located within the LRCMA.
- Maintain and/or improve native wildlife habitat.
- Complete specific land management projects beneficial to protected species.
- Protect nesting, roosting, and foraging wood storks located within the LRCMA.
- Protect nesting, roosting, and foraging bald eagles located within the LRCMA.
- Protect nesting, roosting, and foraging Southeastern big-eared bats located within the LRCMA.
- Maintain reintroduction techniques as a future method to re-establish native species within the LRCMA where human activities have resulted in the local extirpation of that species.
- Protect and perpetuate game species within the LRCMA.
- Reduce non-native pest species populations and their associated impacts in the LRCMA.
- Minimize ecological impacts associated with feral hogs located within the LRCMA.
- Safeguard the public, natural resources, and cultural resources located within the LRCMA.
- Delineate boundaries of the LRCMA.
- Safeguard the public, natural resources, and cultural resources located within the LRCMA.
- Provide opportunities for environmentally compatible public use in the LRCMA.
- The public use program in the LRCMA shall be low impact, nondestructive to environmental and/or ecological characteristics of the area.
- The public use program in the LRCMA shall be passive in nature, not requiring significant facility or infrastructure development (excluding the Lake Russell Environmental Center).

- Control types and levels of public use activities in the LRCMA by the issuance of Special Use Licenses.
- Provide environmentally compatible opportunities for private concessions within the LRCMA.
- Provide pedestrian and motorized access to the LRCMA as specified by District public use rules.
- Provide environmental education, public outreach, and government liaison in association with the LRCMA.
- Use mitigation programs to preserve, restore, enhance, and manage natural resources within the LRCMA.
- Provide annual operational and capital improvement budgets sufficient for staff, equipment, and supply resources which are necessary to attain a level of responsible management as outlined in LRCMA General Management Plan.
- Provide the staff necessary to successfully attain management goals and objectives as outlined in general management plans, activity plans, and annual work plans for the LRCMA.
- Provide for and take advantage of volunteer and alternative work force opportunities within the LRCMA.
- Provide the equipment, supplies, and tools necessary to successfully attain management objectives as outlined in the general management plan, activity plans, and annual work plans for the LRCMA.
- Provide a long-term planning document that fulfills statutory, lease, and policy requirements and provides a framework for management implementation and public oversight.
- To improve realization of management goals, create activity plans for specific management activities that require detailed information for successful implementation.
- Plan management activities on an annual basis to meet program objectives detailed in the general management plan for the LRCMA.
- Track and report progress in attaining management goals.
- Protect the natural and cultural resources within the LRCMA through coordination with interested external entities.
- Improve management efficiency and effectiveness of the LRCMA by entering into and/or maintaining long-term cooperative land management agreements with other land management entities.
- Improve management efficiency by cooperating with other management entities in as-needed, non-contractual arrangements.
- Coordinate land management activities in the LRCMA with adjacent landowners.

6.1.1.1 Kissimmee Chain of Lakes Land Management Advisory Committee Goals

In addition to the broad goals, District-wide policies, and Lower Reedy Creek objectives guiding the Land Stewardship Program, a set of additional goals and policies were developed specifically for the Kissimmee Chain of Lakes properties (including Rough Island and

Johnson Island Management Units). The Kissimmee Chain of Lakes Land Management Advisory Committee was formed in 1995 as a means to solicit input and direction from the public and interested organizations for the management of the properties adjoining the Kissimmee Chain of Lakes. Properties within the LRCMA (Rough Island and Johnson Island Units) at the southern terminus of the creek (south of the Osceola-Polk County line) fall within this area. These areas are subject to the management goals and policies developed by the Committee during a one-year meeting process. A total of 12 goals and 58 policy statements were presented to and approved by the District's Governing Board in September 1996. The goals and policies are listed in detail in Appendix I. Management of Rough and Johnson Island Units will be consistent with these goals and their supportive 58 policy statements.

6.1.2 Preservation and Real Estate Acquisition

To facilitate land acquisition within the Management Area, the District has formed an acquisition team comprised of a title examiner, acquisition negotiator, property appraiser, survey/mapper, and land manager. The team organizes available data, evaluates and prioritizes properties by order of management and biological significance, performs site assessments, and completes the acquisition process.

Management Objectives

- Protect lands within the LRCMA that are necessary for the successful completion of the Kissimmee River Restoration Project.
- Protect lands within the LRCMA that are important hydrologic components of the headwaters of the Kissimmee River.
- Protect lands within the LRCMA that have listed, rare, or sensitive species and/or habitats (including corridors) within them.
- Protect lands within the LRCMA that will improve the effectiveness and efficiency of the area's management.

Management Actions

Regional land managers and Land Stewardship administrative staff will work with FDEP and FWC to determine possible and appropriate protective designations for the LRCMA.

- Regional land managers shall participate in land acquisition team meetings and advise team members on priority acquisition areas.
- Regional land managers shall prepare, upon request, land management evaluations for potential acquisition areas.

The Lower Reedy Creek Management area consists of portions of two project acquisition areas: the Reedy Creek Project Acquisition Area and the Kissimmee River-Kissimmee Chain of Lakes Project Acquisition Area (Map 3). The Reedy Creek Acquisition Area was designated to protect the headwaters of the Kissimmee-Lake Okeechobee-Everglades ecosystem. The Kissimmee River-Kissimmee Chain of Lakes Acquisition Area was

designated, in association with the Lower Kissimmee River Restoration Project, to provide the capacity to store water up the 54-foot National Geodetic Vertical Datum (NGVD) contour line, which is available for release to provide river flow.

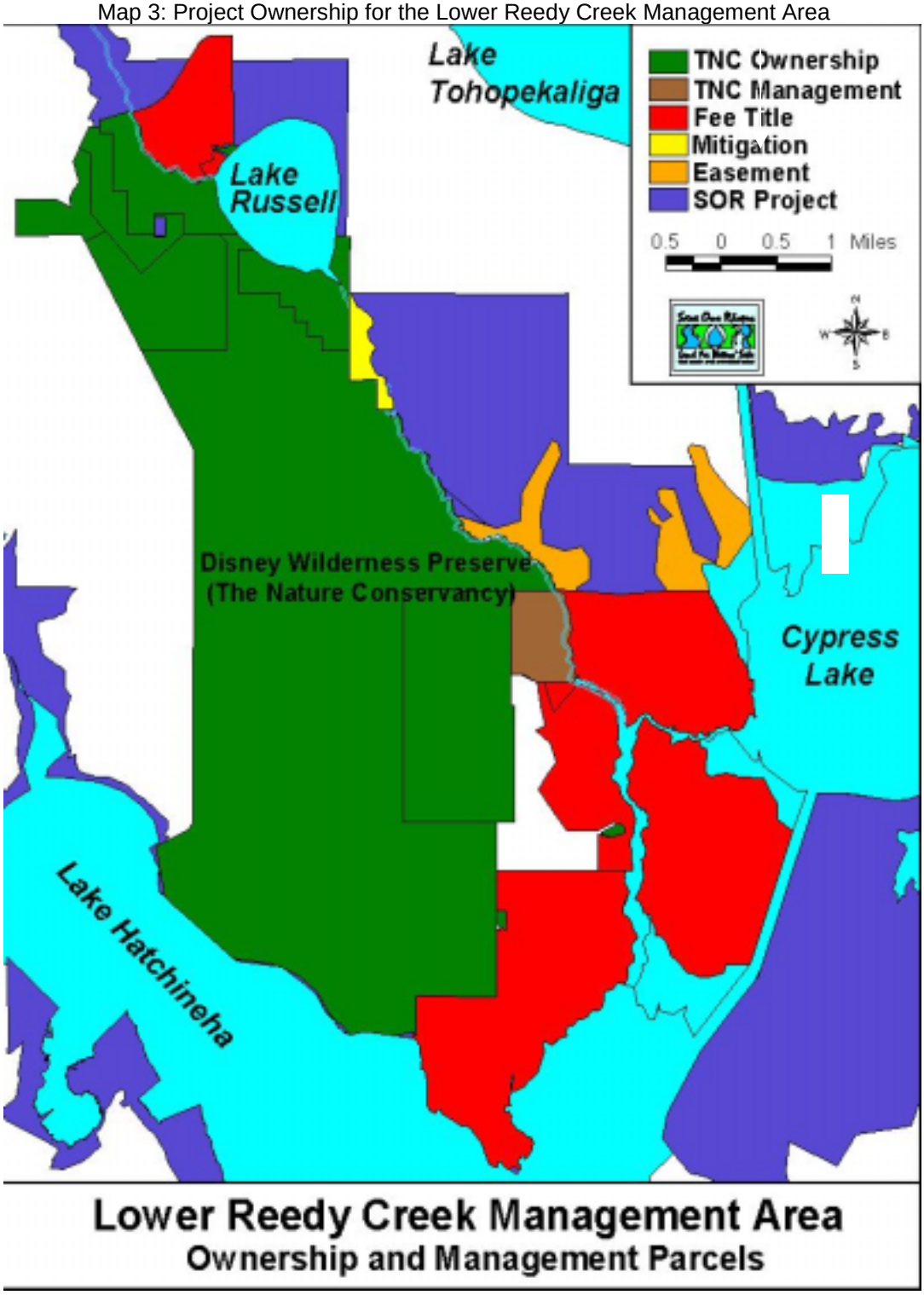
The LRCMA is located in the following Sections, Townships, and Ranges:

- Sections 7, 8, 9, 16, 17, 18, 21, 22, 23, 26, 27, 34, 35,36, Township 27 South, Range 29 East;
- Section 31, Township 27 South, Range 30 East;
- Sections 5, 6, 7, 8, 17, 18, 19, 20, Township 28 South, Range 30 East; and
- Sections 1, 12, 13, 23, 24, 25, 26, Township 28 South, Range 29 East

The LRCMA is located within the following U.S. Geological Survey 7.5-minute quadrangle maps: LAKE CYPRESS; LAKE HATCHINEHA; and LAKE TOHOPEKALIGA
General latitude-longitude ranges of the LRCMA are:

- Northernmost Latitude - 28 09’ 30”
- Southernmost Latitude - 28 00’ 30”
- Easternmost Longitude – 81 20’ 30”
- Westernmost Longitude – 81 27’ 30”

Map 3: Project Ownership for the Lower Reedy Creek Management Area



The Lower Reedy Creek Management Area includes properties owned by the District that lie between the cement bridges on Poinciana Boulevard (to the north) and Cypress Lake and Lake Hatchineha (to the south), including Dead River. The Management Area consists of six management units (Map 4):

- Lake Russell
- Merritt Island (includes Park Equus)
- Rough Island – North
- Rough Island – West (includes the Universal and McKinney tracts)
- Rough Island – South
- Johnson Island

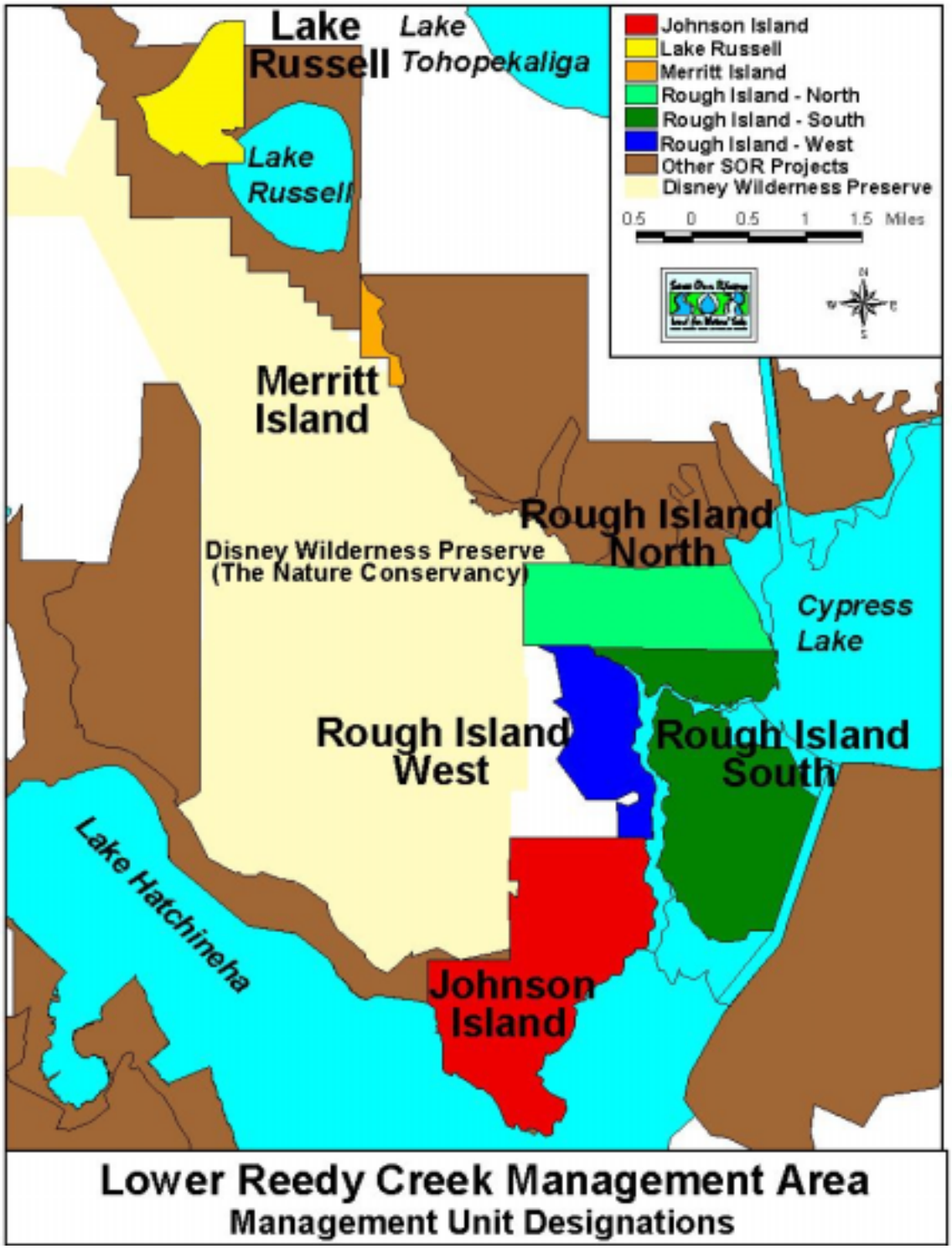
6.1.2.1 Fee-Title Acquisition

As of June 2000, the District had acquired fee-title ownership to approximately 5,665 acres within the LRCMA. Fee-title ownership gives all property rights (not reserved by the prior owner) to the District. This includes the right to manage and provide for public access. During acquisition negotiations, grazing rights were reserved by several former property owners (see Section 6.3.5 Range Management). Table 1 shows the distribution of District ownership by Management Unit as of July 2000. Complete tract information can be found in Appendix B.

Table 1: Fee-Title Ownership by Management Unit

Management Unit	**Total Project Acres**	**Acres Acquired**
Lake Russell	1,397	526
Merritt Island	2,836	96
Rough Island – North	1,068	1,068
Rough Island – West	895	895
Rough Island – South	1,354	1,354
Johnson Island	1,726	1,726
Total	**9,276**	**5,665**

Map 4: Management Units within the Lower Reedy Creek Management Area



Land Stewardship Department policy statements are in **bold** print.
Widely applicable management information is in *italics* print.
Site-specific information is in standard print.

6.1.2.2 Easement Acquisition

In some cases, the District and landowner may agree that purchase of less-than fee-title is appropriate for specific parcels of land. Less-than fee-title acquisition can include flowage, conservation, management access, and public access easements. The District also considers leasing land, or entering into cooperative management agreements.

Within the LRCMA, the District had acquired 592 acres of flowage easements as of June 2000. The flowage easement represents a single tract of land and is located in the Rough Island-North Management Unit. No further acquisition of flowage easements is expected for the Management Area. Under the terms of the flowage easement, the District has the right to store and flow water up to the 54-foot NGVD contour line. The District has acquired no other rights in association with this easement.

The District also holds a lease with the FDEP (#4099) for management of lands (which fall below the Ordinary High Water Level) near the southern terminus of Reedy Creek. The Ordinary High Water Level for this area is generally considered to be at the 52.5-foot NGVD contour line, which has not been surveyed or identified in the field. As such, obtaining an accurate acreage count for areas within the lease may be difficult. Selected terms of the lease follow.

- The term of this lease shall be for an initial period of fifty (50) years, commencing on September 1, 1995 and ending on August 31, 2045;
- [The District] shall manage the leased premises for the establishment and operation of the Restoration Project and for purposes authorized in section 373.59, F.S.;
- [The District] shall manage the leased premises in accordance with the purposes identified . . . which may include, but not limited to, activities such as prescribed burning; control of exotic species; biological investigations; establishment of specific public uses and enforcement of guidelines and regulations, installation and maintenance of signs, gates, and fences; and establishment and enforcement of regulations pertaining to motorized vehicles and watercraft.

6.1.3 Creation

The following restoration policy applies to all Land Stewardship-managed lands.

Policy 05.00111 - The basis for the Land Stewardship Program is the protection and management of natural hydrologic resources.

Policy 05.00113.1 - Lands acquired for natural and/or hydrologic resource benefits shall be managed to conserve and protect those resources.

"Creation" refers to the placement of all physical attributes necessary for a functioning system in a location devoid of those attributes, with the intent of producing a natural functioning system. Creation of natural communities is appropriate where human impact results in major alteration or removal of soil substrate, vegetation and hydrology, as in the case of mining or row crop agriculture. Often costly and time-consuming, this form of

restoration is employed more frequently in mitigation banking (7.1.1.1) than land management operations. LSP reserves the option to use natural community creation as a land management tool where other forms of land management procedures prove inadequate.

Management Objective
- Utilize wetland creation techniques within the LRCMA to offset regional ecological deficiencies.

Management Action
- There are no current or future sites within the LRCMA targeted for natural community creation efforts.

6.1.4 Restoration

The following restoration policy applies to all Land Stewardship-managed lands.

Policy 05.00111.3 - Where feasible, an attempt shall be made to restore a more natural hydroperiod on tracts where the drainage patterns have been altered.

"Restoration" is the re-creation of physical attributes of a degraded natural system with the intent to return it to its original ecological condition and function. In most cases, restoration involves manipulation of topographic features and hydrologic flows. Ideally, restoration efforts attempt to mimic natural conditions that existed before human impact. This ideal, however, is seldom realized due to the interconnected nature of natural systems and physical influences of neighboring lands. Best-case scenarios usually result in restoring partial function to the system, depending on the number of physical and financial constraints of the project.

From 1997-2002, minimal restoration efforts (and enhancement as defined below) will take place within the Rough Island-West Management Unit (McKinney tract). These activities are being conducted by the Greater Orlando Aviation Authority (GOAA) and Post, Buckley, Schuh & Jernigan, Inc. (PBS&J) under permit obligations. The intent is to restore pasture and marsh areas, located west of Dead River, back to wetlands. Plans for the restoration are on file at the District's Orlando Service Center. Restoration efforts are targeted for completion in the year 2002.

Management Objective
- Utilize wetland restoration techniques to improve hydrologic functions within the LRCMA.

Management Actions
- Regional land managers shall oversee the restoration activities undertaken by the GOAA/PBS&J at the Rough Island-West Unit (McKinney tract).
- There are no other sites within the LRCMA targeted for restoration efforts.

6.1.5 Enhancement

"Enhancement" is the improvement of existing natural community conditions by application of best management practices. The majority of SOR property contains natural communities whose function has been altered by previous land use. Land managers attempt to improve natural community conditions by eliminating exotics, applying prescribed fire, and restoring natural hydrologic regimes. Wetland areas within the Johnson Island, Rough Island, and Lake Russell Management Units present opportunities for enhancement activities.

In the Johnson Island Unit, enhancement activities are being implemented as part of off-site mitigation requirements for the Southern Connector Beltway. Ditches will be blocked and an operable structure will be installed in an existing berm. These activities will serve to increase water retention and manipulation capabilities within a 100+ acre marsh. The enhancement plan can be viewed in its entirety at the District's Orlando Service Center.

Rough Island-North and Rough Island-South contain numerous ditches that connect small depression marshes that ultimately drain into surrounding creeks and lakes. Depression marshes can be important habitat for amphibians and reptiles and also serve as feeding areas for wading birds. Tentative plans to plug the system of interconnecting ditches at Rough Island (as a means to enhance the wetland characteristics and functions of the area) have been postponed until cattle reservations expire (2018 in the North Unit and 2016 in the South Unit). Cattle lease and reservation-holders believe that plugging the ditches at this time would render the area useless for grazing as it would inundate the area.

The cypress-dominated basin swamp located in the Lake Russell Unit also presents an opportunity to enhance local hydrology. The District has developed plans to install up to ten culverts under a management access road to improve sheet-flow through the swamp. The plans can be seen at the District's Orlando Service Center.

Management Objective

- Utilize wetland enhancement techniques to improve hydrologic functions within the LRCMA.

Management Actions

- Regional land managers shall coordinate enhancement efforts in the Johnson Island Unit: plugging interior ditches and installing an operable structure within a current weir (the structure to be operated by TNC in conjunction with neighboring enhancement efforts).
- Regional land managers and land management technicians shall implement exotic plant control and prescribed fire programs within the Johnson Island marsh to meet enhancement goals.
- Regional land managers shall coordinate with District construction and engineering staff to implement the swamp enhancement plan in the Lake Russell Management Unit: installation of additional culverts and stabilization of road surface.
- No other earthmoving-enhancement activities are identified or planned for the LRCMA.

6.1.6 Potential Preservation and Protection Programs

Due to the sensitive nature of the resources found in the LRCMA, several additional protective measures have been identified as potential preservation strategies for the area. They include:

- Federal designation as a Wild & Scenic River
- State protection by Legislative Act
- FDEP designation as Outstanding Florida Waters (OFW)
- FDEP designation as Outstanding Natural Resource Waters (ONRW)
- FDEP designation as an Aquatic Preserve
- FDEP designation as a State Park or Recreation Area
- FWC designation as a protected area.

Federal Designation as a Wild & Scenic River

The Wild and Scenic Rivers Act of 1968 seeks protection for waterways in their free-flowing condition due to their significant recreational, scenic, and wildlife value. Although preservation of a waterway in its natural state is the primary goal of the National Wild and Scenic Rivers System, restricting public use of the area is not intended. The inclusion of a waterway into the system does not automatically assign equivalent restrictions to all rivers and streams. Each designation is unique, and therefore management plans for each waterway will differ. A waterway may be added to the National Wild and Scenic Rivers System by a direct act of Congress or by having the governor appeal to the Secretary of the Interior to obtain designation after a river has been added to the state's protection system. The process is detailed and complex, with the latter approach being less frequently sought. An example of a river in Florida that has achieved this status is the Myakka River. The enabling Florida Statute is Chapter 258.501 (select portions are located in Appendix M).

Establishment of a Protected Area by Legislative Act

Similar to National Wild and Scenic Rivers designation is State of Florida Legislative designation as a protected river system. This legislative designation affords specific protection measures unique to each river. The enabling Florida Statute is Chapter 369.301 and 369.309 (select portions are located in Appendix M).

FDEP designation as Outstanding Florida Waters (OFW)

OFW are designated by the FDEP to maintain ambient water quality and assure that no degradation in water quality occurs, in accordance with the Clean Water Act. These designations do not provide specific protection to wildlife, and the only activities affected are those lowering water quality, such as dredge and fill activities and discharge of pollutants. The FDEP does not regulate recreational activities such as boating, fishing, and hiking, or regulate setback distances by OFW designation. The rulemaking process for FDEP designation involves conducting a fact-finding workshop in the area, notifying the involved municipal governments and local districts, and preparing an economic impact analysis on development in the area.

Designating a river as an Outstanding Florida Waterway would restrict activities concerning wastewater discharge and dredging or filling of wetlands. It would not stop development along the waterfront. The decision to make it an OFW, according to FDEP, depends on whether the water has "exceptional ecological or recreational value" and if the social, economic, and environmental benefits outweigh the costs of imposing stricter standards. The designation would prevent water quality degradation. An OFW designation attempts to maintain water quality at its existing levels.

FDEP Designation as Outstanding Natural Resource Waters (ONRW)

Under the Clean Water Act (CWA), every state is required to adopt an antidegradation policy to prevent the further degradation of water quality. One of the antidegradation programs established in the CWA is the designation of ONRWs. In accordance with the Act, each state is to establish a process for the nomination and designation of ONRWs. ONRWs are "high quality waters . . . such as waters of National and State parks and wildlife refuges, and waters of exceptional recreational or ecological significance." ONRWs are regarded as waters possessing the highest water quality, ecological, or recreational significance. No new or increased discharges are allowed to ONRWs or their tributaries that would result in lower water quality. The CWA requires public participation for the effective implementation of the antidegradation policy. Public participation is part of the ONRW process, and the Environmental Protection Agency (EPA) allows the states to decide how best to receive public comment. The state may hold public hearings or provide public notice and the opportunity for the public to request a hearing.

FDEP designation as an Aquatic Preserve

The FDEP has the capacity to designate state-owned submerged lands as aquatic preserves. Areas with this designation are managed under FDEP's Aquatic Preserve Program and have specific regulations associated with each area. The enabling Florida State Statute is 258.36 (select portions are located in Appendix M).

FDEP designation as a State Park or Recreation Area

FDEP can enter into cooperative agreements with other State agencies for the establishment and operation of state parks or recreation areas; both of which by default are also officially considered wildlife preserves. These designations afford areas high levels of protection through FEDP and FWC regulations. The enabling F.S.S. is 258.004 and FWC regulation is 39-18.005 (select portions are located in Appendix M).

FWC Designation as a Protected Area

The FWC can enter into cooperative agreements with other State agencies for the establishment and operation of areas under its management program. These designations afford areas specific protection under FWC regulations and consist of:

- Areas of Critical State Concern
  380.05 (F.S.S.) Areas of critical state concern

- Wildlife Management Areas
- Other Open or Closed Areas
  39-14.0011 (F.A.C.) Opening or Closing Areas
- Wildlife Refuges
  39-18.004 (F.A.C.) Regulations in Wildlife Refuges
- Bird Sanctuaries
  39-19.002 (F.A.C.) Establishment of Restricted Hunting Areas, and Bird Sanctuaries, Procedure
  39-19.004 (F.A.C.) Regulations in Bird Sanctuaries
- Critical Wildlife Areas
  39-19.005 (F.A.C.) Establishment and Protection of Critical Wildlife Areas

Select portions of relevant Florida State Statutes and FWC regulations are located in Appendix M.

6.2 Resource Evaluation

The following resource evaluation policy applies to all Land Stewardship-managed properties.

Policy 05.00113.6 - Evaluation and monitoring of management activities shall be conducted to improve program effectiveness and efficiency.

The LSP implements an evaluation program to determine the presence, status and condition of resources, the effectiveness of land management operations, and result of implementing best management practices over time. Resource evaluation is achieved through natural area inventories, monitoring of management activities, and data analysis derived from research on land management procedures.

6.2.1 Inventories

The following inventory policy applies to all Land Stewardship-managed lands.

Policy 05.00113.6 - Inventories of natural and historic resources shall be performed to provide information for effective land management planning, natural community maintenance, and ecological restoration.

Vegetation and vertebrate species are inventoried and natural communities are mapped by District staff or contracted specialists. Plant and wildlife lists are generated for each management area. Rare species lists are made available to land managers for planning purposes, however, information on specific rare species locations are restricted from the general public for the purpose of species protection. Archaeological and historic sites considered significant are subject to inventories by contracted archeologists. Inventory data is on file within the Planning Section of the LSP and non-sensitive data available for review on the District's computer network server.

Cursory searches of information databases revealed that the FWC has identified the area in and around the LRCMA as a "Strategic Habitat Conservation Area." This designation represents an area important to flora, fauna, and natural communities based on known occurrence information and recent land use/land cover maps (FWC 2000a). It is also considered a "Biodiversity Hotspot" as it represents an area with a high degree of overlap for 5-7+ declining species of wildlife (plus known occurrences of flora, fauna, & natural communities) (FWC 2000b). In addition, the southern terminus of Dead River/Reedy Creek is considered a "Priority Wetland for Listed Species" as it represents wetland habitats critical for one to three wetland-dependant species of vertebrates listed as endangered, threatened, or species of special concern (FWC 2000c).

Data collected by District or contract staff for the LRCMA includes baseline information on natural vegetative community types and wildlife. *The LSP shares natural areas and species data with the FNAI through a Memorandum Of Understanding (Contract # C-9341). The District finalized an MOU with the FNAI to facilitate exchange of listed species data on SOR lands. FNAI expertise as a clearinghouse for statewide species inventories provides valuable information on protection of rare species on LSP-managed properties. The District, in turn, makes available SOR natural area inventory information for the FNAI database.*

Wildlife Inventories

Inventories have documented 146 animal species within the LRCMA (Appendices F, G, and H). These are predominantly bird species occurring in the Rough Island Units. Further documentation of mammals, amphibians, reptiles, and fishes is needed throughout the Management Area. In addition, documentation of bird species inhabiting the Lake Russell and Johnson Island Units is also needed.

In 1996, TNC prepared an inventory and analysis of species and habitat within the Reedy Creek/Lake Marion Creek watershed, along with conservation recommendations. Of the 368 vertebrate species identified in the area, 35 have state or federal protection, or were classified as a candidate for listing before the category was eliminated. Population surveys, breeding success, and habitat management were primary focal points for research.

Bird species known to use the Reedy Creek watershed included limpkins (Aramus guarauna), little blue herons (Egretta caerulea), white ibises, American swallow-tailed kites (Elanoides forficatus*)*, crested caracaras, and tri-colored herons *(*Egretta tricolor*)*, as well as ospreys, bald eagles, and sandhill cranes (Richardson et al. 1996). Sherman's fox squirrels (Sciurus niger shermani) live within the same live oak hammock that shelters the bat trailer (6.2.2.3). Several species of butterflies and moths (some of which have been identified as prey for southeastern big-eared bats) use the forested swamp—upland interface area. (Finn 1999a).

While the lower Reedy Creek is of particular importance to wood storks, bald eagles, and Southeastern big-eared bats, the region also provides habitat to many other sensitive species, including the endangered everglades kite (Rostrhamus sociabilis) and the threatened

American alligator (Alligator mississippiensis*)* (Richardson et al. 1996). Other species found within the area that have some type of protective status include the snail kite (Rostrhamus sociabilis), red-cockaded woodpecker (Picoides borealis), and Florida panther (Felis concolor coryi), have joined the wood stork on the federal list of endangered species (USFWS 1999a). Other species listed under State or federal law includes the Florida scrub-jay, crested caracara, Florida sandhill crane, gopher tortoise, and American alligator (FWC 1997). The FWC and Florida Committee on Rare and Endangered Plants and Animals (FCREPA) list the limpkin, white ibis, little blue heron, and tricolored heron as species of special concern.

Large game animals that inhabit the Management Area include feral pigs, eastern wild turkeys (Meleagris gallopavo), and whitetail deer. The nine-banded armadillo (Dasypus novemcinctus) and feral pig are considered exotic mammals. Coyotes (Canas latrans), a native species and frequent inhabitant of northern states, have expanded their range to south Florida. Their presence in the area is probable.

A report written by District staff (Lower Reedy Creek Management Area Natural Resources and Management Review, Hillbauer 1999) summarizes information and issues concerning wildlife species inhabiting the Management Area. The report is kept on file at the District's Orlando Service Center. The report centered on the American wood storks, bald eagles, and Southeastern big-eared bats that are found in the area (6.2.2) .

Management Objective
- Identify the type, locations, and habitat needs of wildlife species found within the LRCMA.

Management Actions
- Maintain a master file of confirmed and potential wildlife species inhabiting the LRCMA.
- Coordinate or conduct wildlife inventories in the Lake Russell and Johnson Island Units.

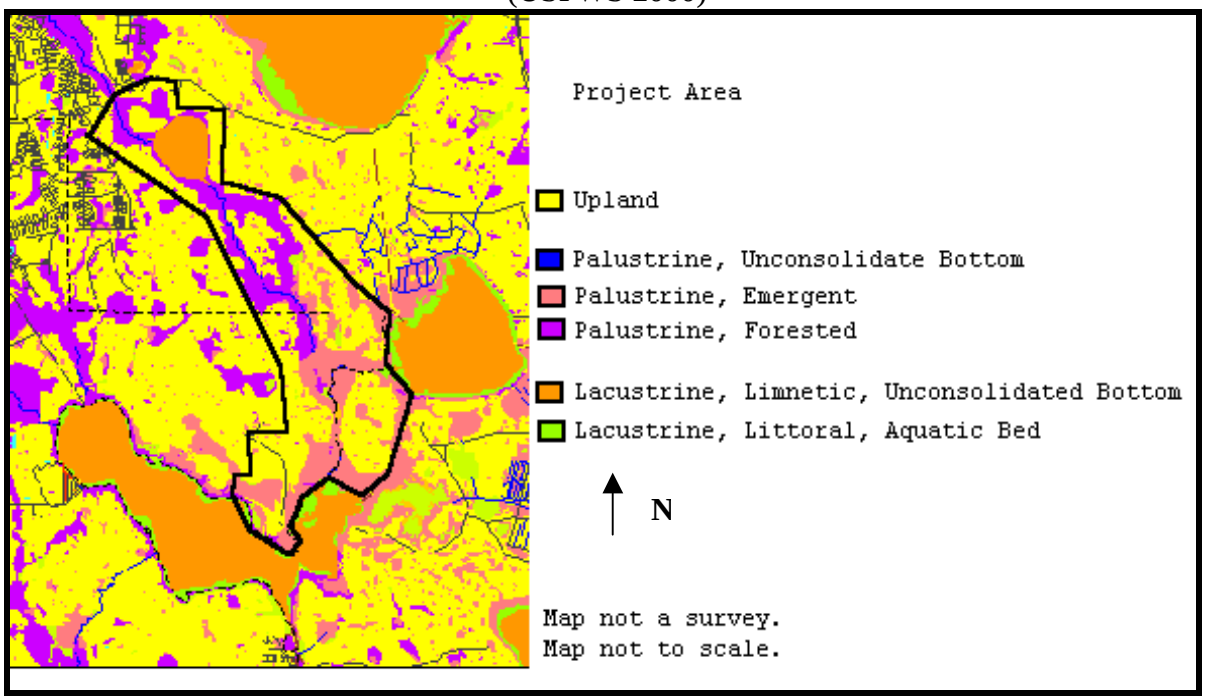
6.2.1.1 Natural Communities

Three types of community maps are available for LRCMA:

- National Wetlands Inventory Map produced by the U.S. Fish and Wildlife Service;
- Natural Soils Landscape Positions Map produced by the U.S. Natural Resource Conservation Service and the SFWMD (Map 5); and
- Florida Land Cover Map produced by the FWC.

The various maps allow managers to compare areas based on their specific interests and needs. Detailed community maps for each Management Unit are also on file at the Orlando Service Center (Maps 6 – 11).

Map 5: National Wetlands Inventory of the Lower Reedy Creek Management Area (USFWS 2000)



Six management units are under the Land Stewardship Program's management and/or oversight within the LRCMA:

- Lake Russell: mapped by District contractor (Map 6)
- Merritt Island (Park Equus): mapped by TNC (Map 7)
- Rough Island – North: mapping to be completed by District contractors in 2001 (Map 8)
- Rough Island – South: mapping to be completed by District contractors in 2001 (Map 9)
- Rough Island – West (Universal and Mckinney): mapped by TNC and GOAA/PBS&J (Map 10)
- Johnson Island: mapped by District staff (Map 11)

Plant inventories have identified 412 species within the Management Area (Appendix D). The most intensive inventories have occurred in the Lake Russell and Rough Island Units. The Johnson Island Unit remains to be inventoried. The number of documented species are as follows:

- Lake Russell: 282 species
- Merritt Island (Park Equus) – 20 species
- Rough Island – North: 221 species
- Rough Island – South: 223 species

- Rough Island – West: 47 species
- Johnson Island: 4 species

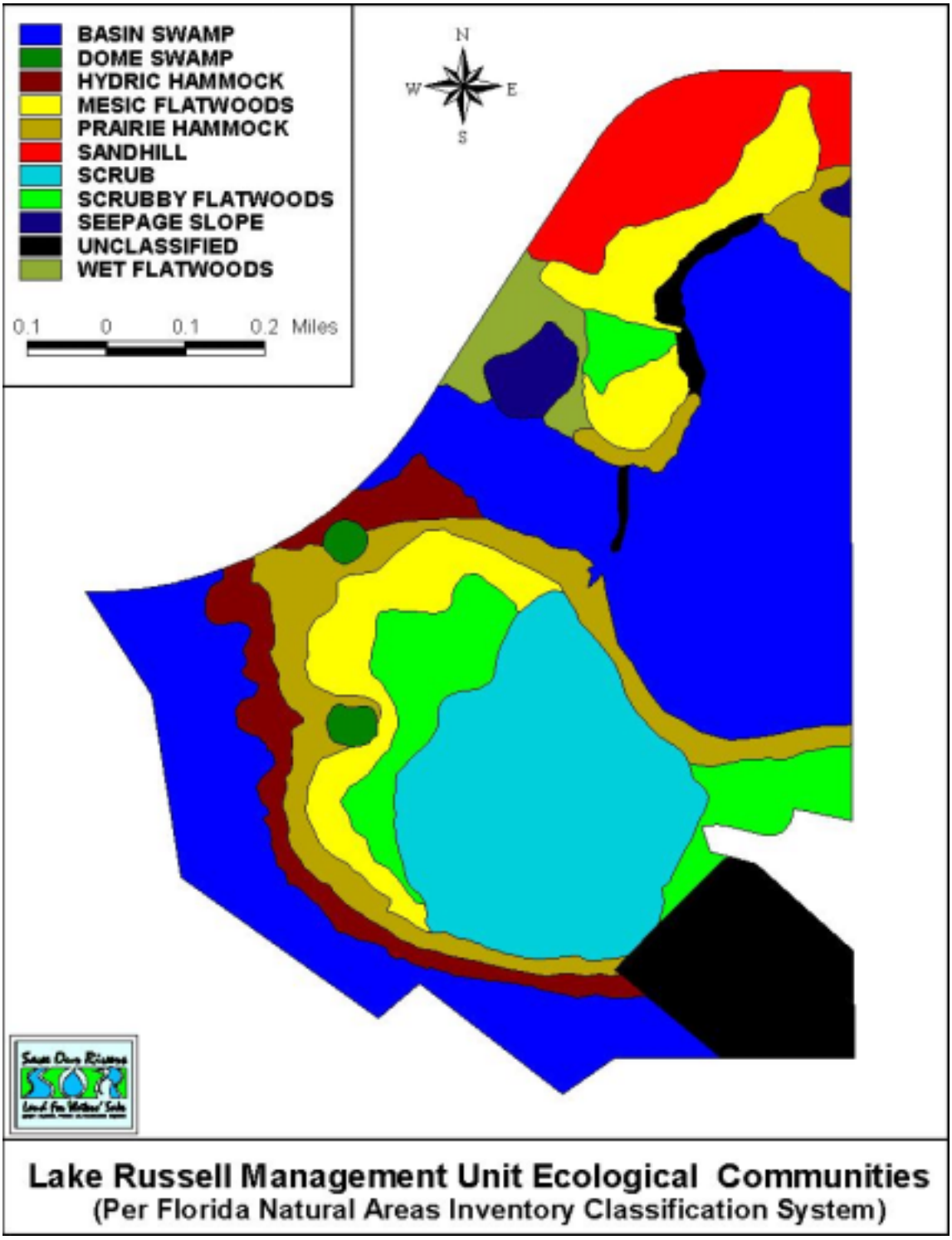
Management Objective

- Document ecological communities and species occurrences within the LRCMA.

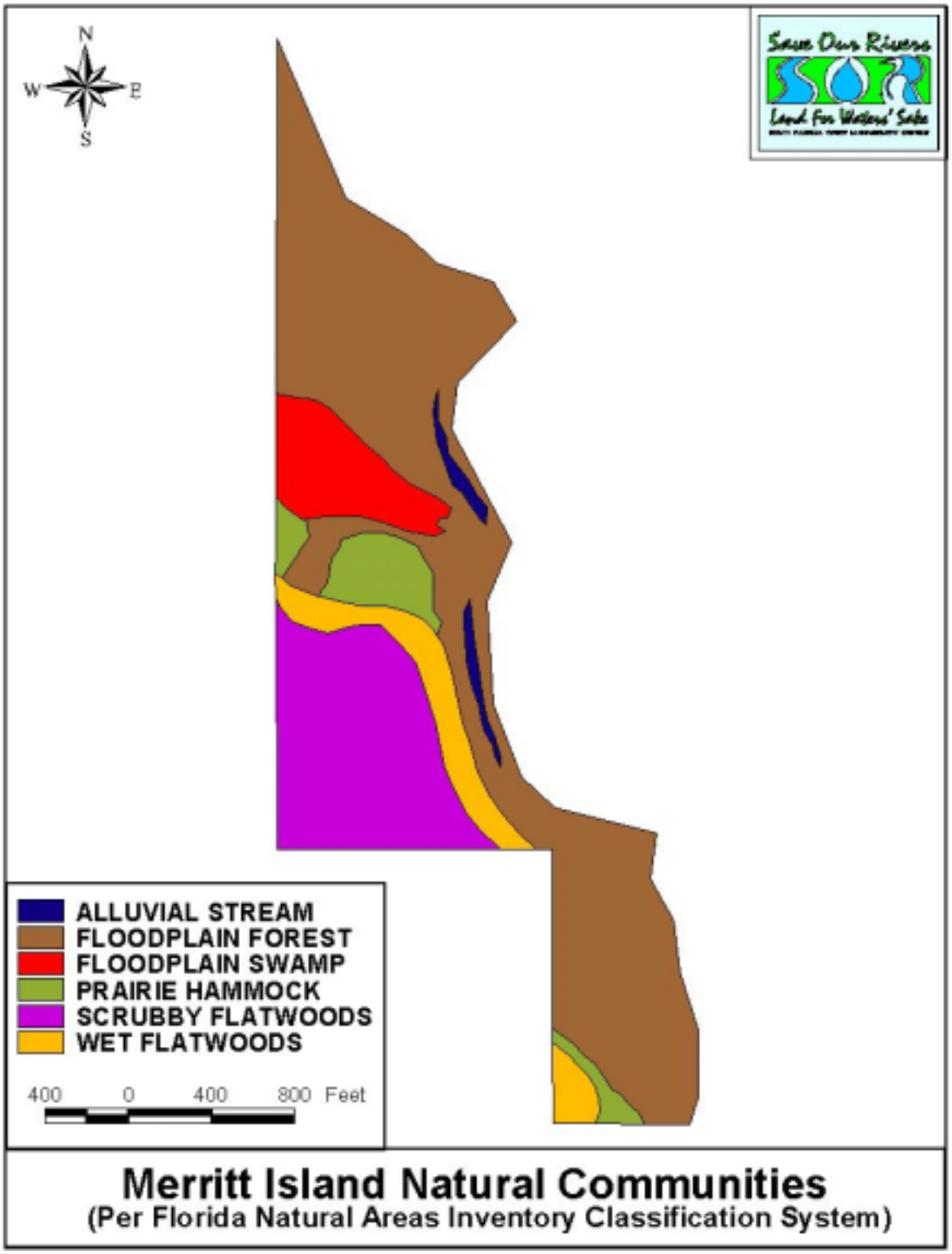
Management Action

- Initiate and/or contract an inventory for the Johnson Island Management Unit.
- Coordinate with the contract botanists during the final inventory for the Management Area – Rough Island (2000-2002).
- Document casual observations of new plant species in the LRCMA.
- Evaluate additional parcels as they are acquired to determine management inventory requirements.

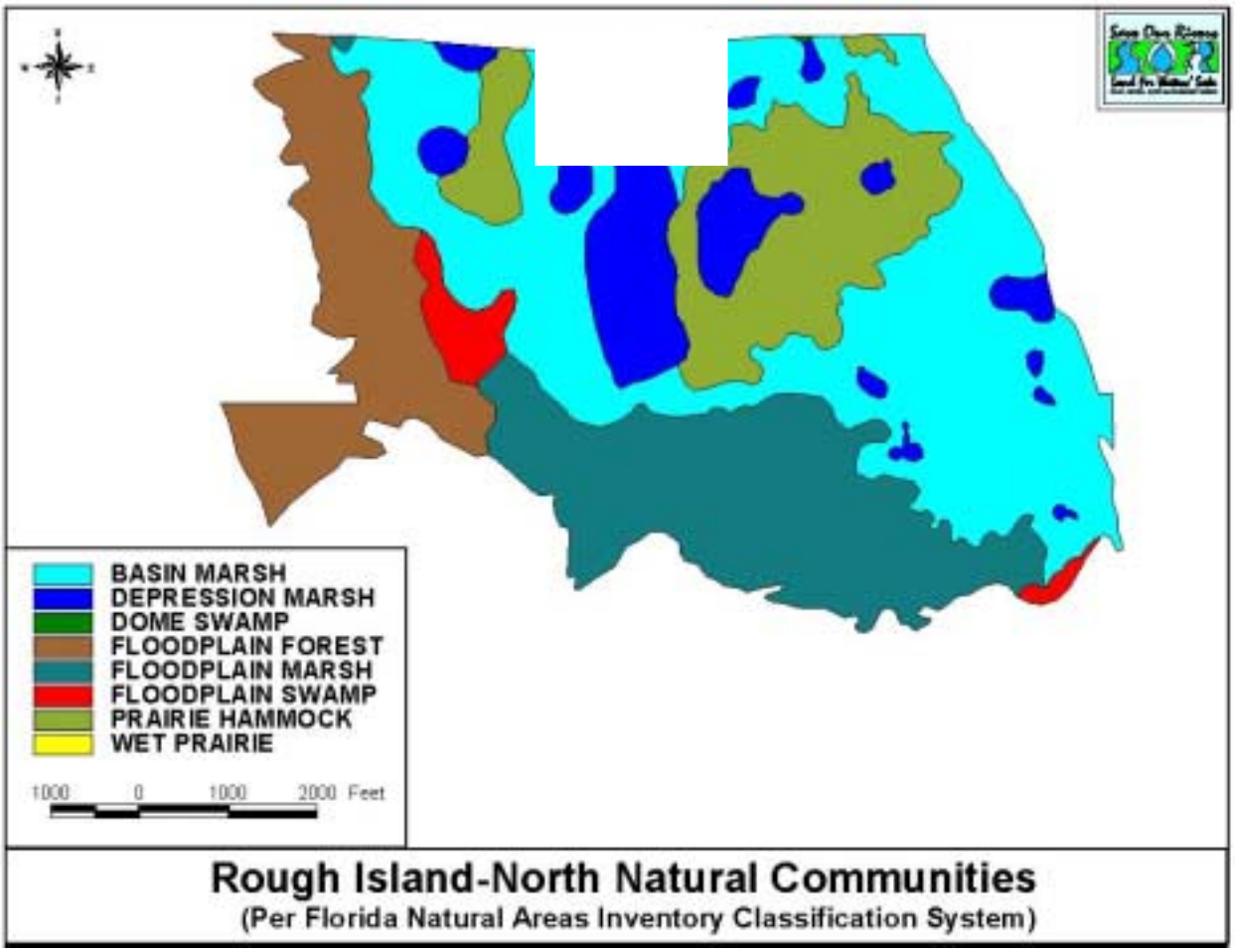
Map 6: Lake Russell Management Unit Ecological Communities



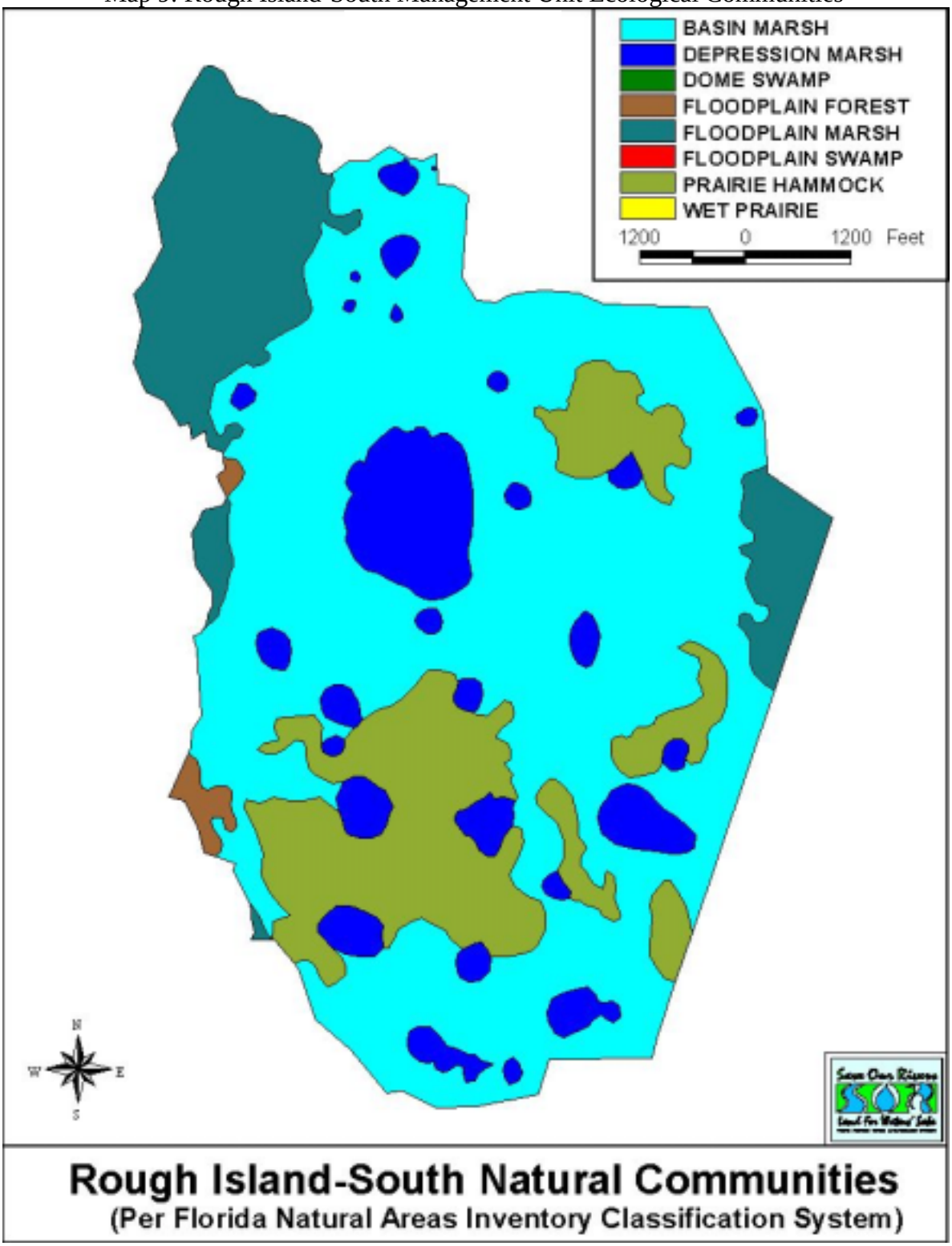
Map 7: Merritt Island Management Unit (Park Equus) Ecological Communities



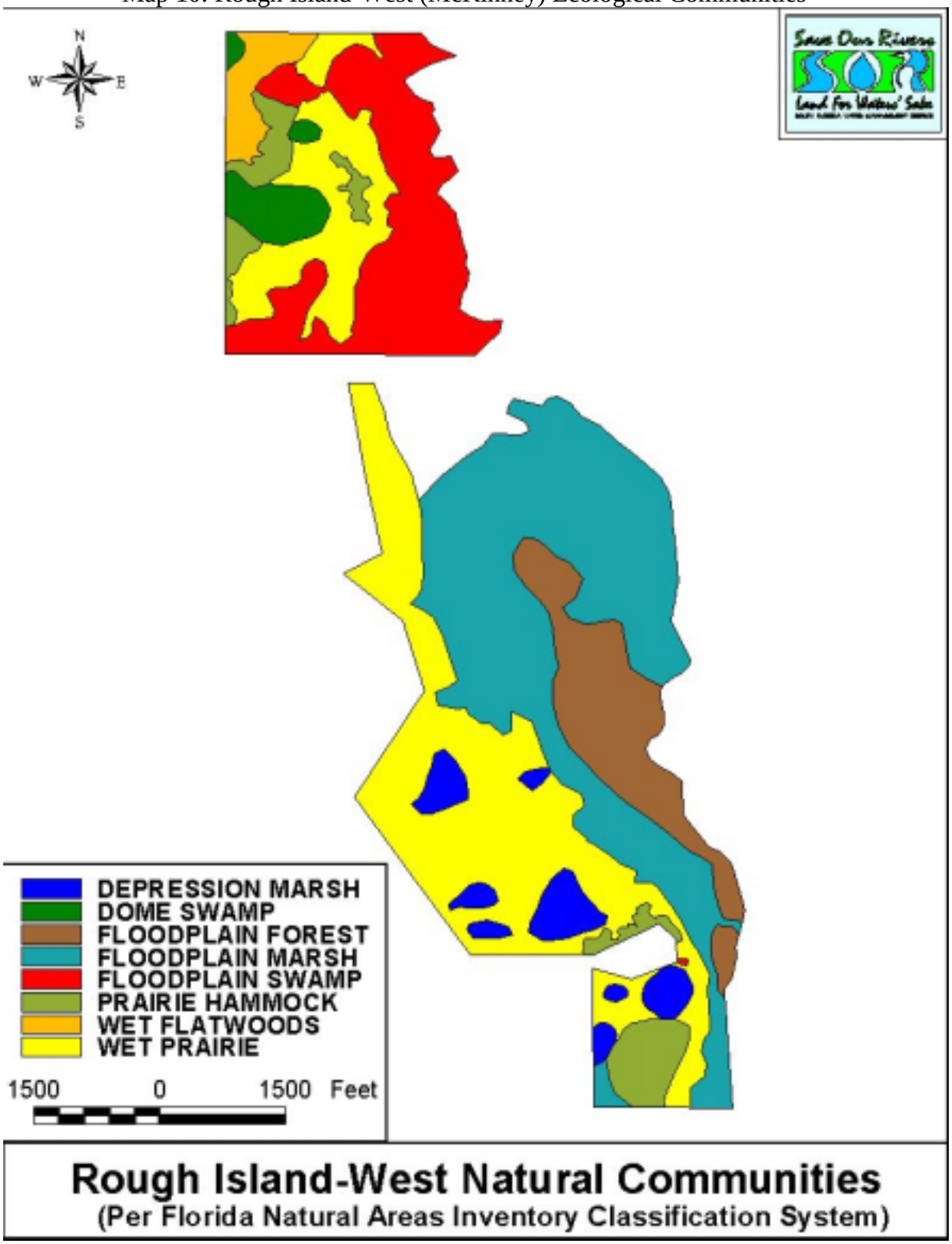
8: Rough Island-North Management Unit Ecological Communities



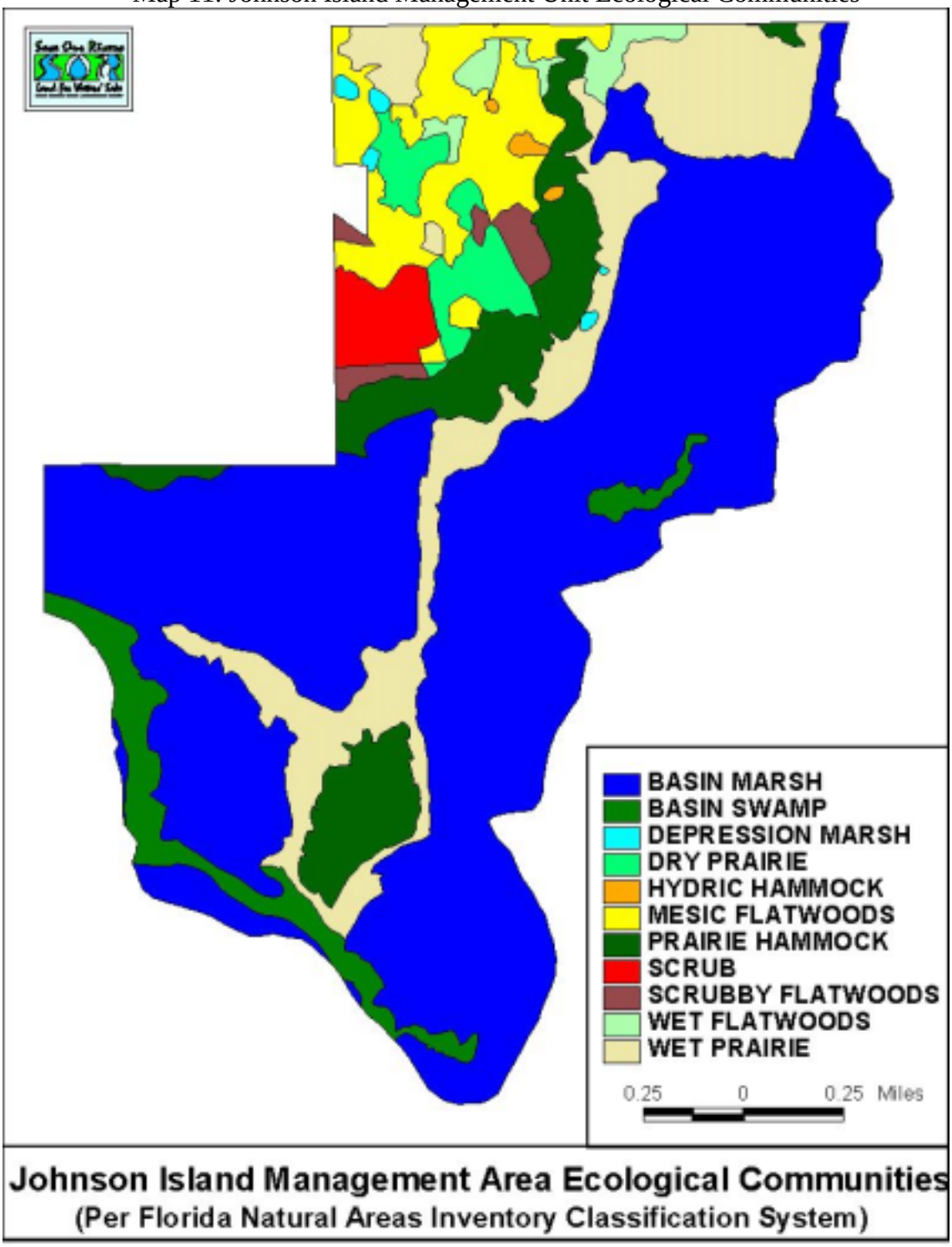
Map 9: Rough Island-South Management Unit Ecological Communities



Map 10: Rough Island-West (McKinney) Ecological Communities



Map 11: Johnson Island Management Unit Ecological Communities



Community conditions vary widely within the Reedy Creek floodplain, depending on previous and current land use, hydrologic alteration, and exotic plant infestation. To facilitate standardization, the LSP attempts to classify natural vegetative community types as per the FNAI (1990) (see Table 2). Within the LRCMA there are 16 distinct natural community types (excluding disturbed or unclassified areas).

Table 2: Ecological Community Type Summary by Management Unit
X = documented ~ = converted from a non-FNAI designation

FNAI Community Type	Lake Russell	Merritt Isl- Park Equus	Rough Isl- North	Rough Isl- South	Rough Isl- West	Johnson Island
Basin Marsh			X	X	~ Freshwater marsh, Willow	X
Basin Swamp	X	~ Wetland Forested Mixed, Cypress	X		~ Wetland Forested Mixed, Cypress	X
Depression Marsh			X	X		X
Dry Prairie						X
Dome Swamp	X					
Hydric Hammock		~ Water Oak				X
Mesic Flatwoods	X	~ Pine Flatwoods			~ Other Pines	X
Mesic Hammock	X	~ Pine, Mesic Oak				
Prairie Hammock		~ Xeric Oak	X	X	~ Live Oak	X
Sandhill	X					
Scrub	X					X
Scrubby Flatwoods	X					X
Scrubby Flatwoods (disturbed)	X					
Seepage Slope	X					
Wet Flatwoods	X					X
Wetlands (disturbed)	X					
Wet Prairie			X	X	~Pasture, Wet Rangeland	X
Unclassified	X				~ Borrow Pit	

Basin Marsh (2,961 acres)
Basin marshes are herbaceous or shrubby wetlands situated in relatively large and irregular shaped basins (FNAI 1990). This community is rare within the Reedy Creek area, and is typified by marsh openings within basin swamps, or extensive marshes occupying large, shallow basin landscape positions (Bridges and Reese 1996). Common species are saw grass (Cladium jamaicense), willow (Salix sp.) and buttonbush (Cephalanthus occidentalis).

Basin Swamp (260 acres)
Basin swamp is generally characterized as a relatively large and irregularly shaped basin that is not associated with rivers, but is vegetated with hydrophytic trees and shrubs that can withstand an extended hydroperiod. Dominant trees include cypress and Florida slash pine (*Pinus elliottii*). Other typical plants include red maple, swamp bay (*Persea palustris*), sweetbay (*Magnolia virginiana*), loblolly bay (*Gordonia lasia*nthus), Virginia willow (*Itea virginica*), fetterbush (*Lyonia lucidi*), wax myrtle (*Myrica cerifera*), and buttonbush.

Soils in basin swamps are generally acidic, nutrient-poor peat, often overlying a clay lens or other impervious layer. The resulting perched water table may act as a reservoir releasing groundwater as adjacent upland water tables drop during drought periods. The typical hydroperiod is approximately 200 to 300 days. Basin swamps are thought to have developed in oxbows of former rivers or in ancient coastal swales and lagoons that existed during higher sea levels. Most basin swamps have been degraded by timber harvests and many have been drained or polluted, thus very few pristine examples exist. Those that remain should be adequately protected and properly managed. Basin swamps rank "S4?," secure statewide, although it may be rare in some parts of its state range. More research is required for both state and global ranking.

Depression Marsh (293 acres)
Depression marsh is characterized as a shallow, usually rounded depression in sand substrate with herbaceous vegetation often in concentric bands (FNAI 1990). Typical plants include St. John's wort (*Hypericum sp*.), yellow-eyed grass (*Xyris sp.)*, chain fern (*Woodwardia sp*.), primrose willow (*Ludwigia peruviana*), maidencane (Panicum hemitomum), wax myrtle, buttonbush, pickerelweed (*Pontederia cordata*), and bladderwort (*Utricularia sp.).*

Where marshes occur, one of three geological conditions is present; surficial deposits are impermeable, the water table emerges through the permeable substrate, or the marsh is hydrologically connected to a river. Depression marshes are characteristically small in size and hydrologically isolated from other surface water bodies. Water is received by runoff, seepage or direct rainfall. Hydroperiods range widely from as few as 50 days or less to more than 200 days per year (FNAI 1990). Bottom soils are generally acidic peat, resulting from accumulation of decayed plant material.

Depression marshes provide critical breeding and foraging habitat for a wide assemblage of amphibians and reptiles not found in larger, more permanent systems. Cyclic surface water availability promotes foraging by numerous listed wading bird species such as the wood stork, white ibis (Eudocimus albus), snowy egret (Egretta thula), and Florida sandhill crane (Grus canadensis pratensis).

Impacts on depression marshes in the Management Area include ditching and use by watering livestock. Ditching dewaters marshes and alters natural hydrologic cycles. Cattle inadvertently trample wetland vegetation, disturb the soil and introduce the exotic bladderpod and tropical soda apple into shallow ephemeral zones.

Depression marsh is ranked statewide as "G," because it is very rare throughout its range, found locally (even abundantly) at some of its locations in a restricted range, or because of other factors making it vulnerable to extinction throughout its range. Global ranking indicates it is apparently secure, though it may be quite rare in parts of its range, especially at the periphery. Further research is required for a definitive global classification.

<u>Disturbed Wetlands and Uplands</u> (37 acres)
The highly disturbed or altered areas within the Management Area are small in size, encountered infrequently, and can be described as being completely cleared areas, filled areas or areas with surface alterations (Bridges and Reese 1996). This community type is not identified by the FNAI (1990). The floristic composition and vegetative dominance of these highly altered areas is extremely variable and successional to other vegetation. These areas, or the ground surfaces within them, have been altered to such an extent that it is difficult to map their natural vegetative composition. The alterations have "created" new habitat types with little resemblance to natural communities. Characteristic and restricted species are not discussed for these communities, since each represent a unique combination of environmental conditions and disturbance history (Bridges and Reese 1996).

<u>Dome Swamp</u> (120 acres)
Dome swamps are characterized as shallow, forested, usually circular depressions that generally present a domed profile because smaller trees grow in the shallower waters at the outer edge, while larger trees grow in the deeper water in the interior. Pond cypress (*Taxodium ascendens*) and slash pine (in transition areas) are common trees. Other typical plants include red maple, dahoon holly (Ilex cassine), swamp bay, sweetbay, loblolly bay, virginia willow, fetterbush, chain fern (Woodwardia virginiana), netted chain fern (Woodwardia areolata), poison ivy (Toxicodendron radicans), Spanish moss (Tillandsia usneoides), wild pine (Tillandsia sp.), royal fern (Osmunda regalis), cinnamon fern (Osmunda cinnamomea), coastal plain willow (Salix caroliniana), maidencane, wax myrtle, orchids (Encyclia sp.), St. John's wort, sawgrass, lizard's tail (Saururus cernuus), floating heart (Nymphoides aquatica), buttonbush, and alligator flag (Thalia geniculata).

Dome swamps typically develop in sandy flatwoods, in conical depressions. Soils are composed of peat, which become thickest toward the center of the dome, and are generally underlain with acidic sands and then limestone, although other subsoils may also occur. Some domes have a clay lens that helps retain water levels. Dome swamps often derive much of their water through runoff from surrounding uplands, but they may also be connected with underground channels in which case subterranean flows would dominate the hydrological regime. Dome swamps generally function as reservoirs that recharge the aquifer when adjacent water tables drop during drought periods. The normal hydroperiod is 200 to 300 days per year with water being deepest and remaining longest near the center of the dome.

Normal hydroperiods must be maintained for dome preservation. Somewhat deeper than normal water levels are not likely to do much harm, but extended hydroperiods will limit tree growth and prevent reproduction. Shortened hydroperiods permit the invasion of mesophytic species, which will change the character of the understory and eventually allow hardwoods to replace cypress. Dome swamps may also be degraded by pollution and the invasion of exotic plants. Dome swamps typically grade into wet prairie, marl prairie or swale. Species composition of dome swamps frequently overlap with strand swamp, wet flatwoods, basin swamp, baygall, and floodplain swamp.

Dome swamps are considered rare or uncommon in the state "S3?" but secure globally "G4?." More research is needed for definitive ranking of both categories.

<u>Dry Prairie</u> (49 acres)
Dry prairie is characterized as a nearly treeless plain with a dense ground cover of wiregrass (Aristida sp.), saw palmetto (Serenoa repens), and other grasses, herbs and low shrubs. Typical species include flat-topped goldenrod (Euthamia minor), fetterbush, shiny blueberry (vaccinium myrsinites), sand live oak (Quercus geminata), gallberry (Ilex glabra), Atlantic St. John's-wort (Hypericum reductum), elephant's foot (Elaphantopus sp.), blazing star (Liatris sp.) and sedges (Carex sp.). Dry prairie species are similar to mesic flatwoods, and there is speculation as to whether dry prairie is simply a treeless form of the latter.

Dry prairies occur on flat, poorly drained acidic sandy soils overlying a hardpan. During heavy rain events, water percolates slowly and remains on the soil surface only for short periods. During the majority of the year, the water table is well below the surface, favoring the establishment of drought-tolerant species. In the Lower Reedy Creek region, dry prairie often grades into scrubby flatwoods, mesic flatwoods or prairie hammock.

The need for preservation of existing dry prairie cannot be understated. The most extensive dry prairies in Florida occur north and west of Lake Okeechobee along the Kissimmee River. This endemic community is listed as "S2" in state and global rankings, defined as imperiled statewide and globally because of rarity and vulnerability (6-20 occurrences or little remaining area) (FNAI 1990). Additionally, its importance is emphasized because it supports protected species such as the crested caracara (Caracara plancus) and gopher tortoise

(Gopherus polyphemus). Management of this fire-dependent community will include prescribed burns on natural cycles, with consideration to listed species habitat requirements.

Hydric Hammock (29 acres)
Hydric hammock is characterized as a well-developed hardwood and cabbage palm forest with a variable understory often dominated by palms and ferns. Typical plants include cabbage palm (Sabal palmetto), red maple, swamp bay, sweetbay, water oak (Quercus nigra), wax myrtle, saw palmetto, poison ivy, dahoon holly, royal fern, pepper vine (Ampleopsis arborea), virginia creeper (Parthenocissus quinquefolia) and marsh fern (Theleptris sp.).

Hydric hammock occurs on low, flat, wet sites where limestone may be near the surface and frequently outcrops. Soils are sands with considerable organic material that, although generally saturated, are inundated only for short periods following heavy rains. The normal hydroperiod is seldom over 60 days per year. Hydric hammock occurs as patches in a variety of lowland situations, generally grading into floodplain swamp, strand swamp, basin swamp, baygall, floodplain forest or wet flatwoods.

The normal hydrologic regime must be maintained in hydric hammocks. If the water table is lowered, hydric hammocks will gradually change to mesic conditions. If the hammock is flooded, many trees will die and eventually be replaced by more hydrophytic species.

Hydric hammock is ranked as apparently secure in the state "S4," although it may be rare in some parts of its state range. Further research is required for a definitive global classification.

Mesic Flatwoods (174 acres)
Mesic flatwoods are found on poorly drained, but rarely if ever inundated soils. They occupy extensive flat inter-drainageway plains in central Florida. Mesic flatwoods are characterized as an open canopy forest of widely spaced pine (Pinus sp.*)* trees with little or no understory but a dense ground cover of herbs and shrubs. Several variations of mesic flatwoods are recognized, the most common in the Management Area being and slash pine-gallberry-saw palmetto.

Prairie Hammock (670 acres)
Prairie hammock is characterized as a clump of tall cabbage palms and live oaks in the midst of prairie or marsh communities (FNAI 1990). Prairie hammocks establish on elevated soils surrounded by lower topography. These islands are generally sandy marl flooding only for a short duration during the highest water levels.

Canopy species include live oak (Quercus virginiana) and cabbage palm, with occasional laurel oak (Quercus laurifolia) in lower elevations. An abundance of epiphytes, including listed species, are found in mature canopy trees. As in most prairie hammocks, there is a

sparse under-story due to over-story shading, but cover is also reduced by cattle grazing and trampling of shrub and ground layer vegetation. Many species common to undisturbed hammocks are sparse or lacking, replaced by disturbance species such as broomweed (Sida sp.), tropical soda apple (*Solanum viarum*) and caesarweed (Urena lobata). Typical under-story plants of pristine prairie hammocks include wax myrtle, water oak, beautyberry (Callicarpa americana), and saw palmetto.

FNAI ranks prairie hammocks as "G4" and "S4" both statewide and globally secure, though it may be quite rare in parts of its range, especially at the periphery.

<u>*Scrub*</u> (112 acres)
Scrub occurs in many forms, but is often characterized as a closed to open canopy forest of sand pines with dense clumps or vast thickets of scrub oaks and other shrubs dominating the understory (FNAI 1990). The later structural form is the case for much of the scrub within the Lower Reedy Creek. Typical plants include sand live oak, myrtle oak (Quercus myrtifolia), Chapman's oak (Quercus chapmanii), scrub oak (Quercus inopina), saw palmetto, rosemary (Ceratiola ericoides*)*, rusty lyonia *(*Lyonia ferruginea), fetterbush, and wiregrass. Highest elevations in the Management Area support this community. In all locations, the soils are sandy, well drained, loose and non-organic.

Scrub is being lost at an alarming rate throughout the state, as high elevations and fast drainage make this community highly desirable for development. This association occurs almost exclusively in Florida. State ranking of scrub is "S2," imperiled in the state because of its rarity and vulnerability, with estimates of 6-20 occurrences (FNAI 1990).

<u>Scrubby Flatwoods</u> (77 acres)
Scrubby flatwoods are characterized as an open canopy forest of widely scattered pine trees with a sparse shrubby understory and numerous areas of barren white sand (FNAI 1990). This community occurs on sites slightly higher in elevation than mesic flatwoods, but lower than scrub. Soils are well drained and dry, even during maximum rainfall events. Unlike scrub, the water table is relatively close to the soil surface. As with typical scrubby flatwoods, the LRCMA harbors species common to both scrub and mesic flatwoods. Typical species include slash pine, saw palmetto, myrtle oak, Chapman's oak, sand live oak, fetterbush, rusty lyonia, tarflower (Befaria racemosa), goldenrod (solidago sp.), and wiregrass.

Due to floristic and geographic similarities, some ecologists speculate that this community is merely a form of mesic flatwoods where fire has been excluded. This theory is based on the natural occurrence of hardwood (oak) invasion without sufficient fire frequency patterns.

Although scrubby flatwoods are fairly widespread geographically, the total area of this association is quite limited (Myers and Ewel 1990). Global and state rankings list this community as "G3" and "S3," either very rare and local throughout its range or found

locally (even abundantly at some of its locations, 21 to 100 occurrences statewide) in a restricted range, or because of other factors making it vulnerable to extinction throughout its range. In addition, scrubby flatwoods provide habitat for the gopher tortoise—a species of special concern) and the Florida scrub jay (*Aphelocoma coerulescens*) –a threatened species (FWC 1997).

Seepage Slope (7 acres)
Seepage slopes are wetlands characterized as shrub thickets or boggy meadows on or at the base of a slope where moisture is maintained by downslope seepage such that the ground is usually saturated but rarely inundated (FNAI 1990). One of the most characteristic tree species on this community is loblolly bay, sometimes with a mixture of sweet bay, swamp bay, black gum (Nyssa biflora), and/or red maple (Bridges and Reese 1996).

Wet Flatwoods (62 acres)
Wet flatwoods are characterized as relatively open-canopy forests of scattered pine trees or cabbage palms with either a thick shrubby under-story and very sparse ground cover, or a sparse understory and a dense ground cover of hydrophytic herbs and shrubs, with variations between these extremes (FNAI 1990). A typical species scenario for Reedy Creek flatwoods is a Florida slash pine and cabbage palm overstory with an under-story of scattered saw palmetto, wax myrtle, gallberry and bluestem (Andropogon sp.). Native ground cover species are frequently displaced by non-native bahia. Wet flatwoods develop on poorly drained acidic, low nutrient sands underlain by hardpan. Surface water appears a minimum of one month per year.

Wet flatwoods has a state ranking of "S4?," apparently secure in the state, although it may be rare in some parts of its state range. Global ranking requires further research. Most wet flatwoods are extremely vulnerable to hydrologic manipulation and exotic invasion. Consequently, non-native species are targeted for eradication, and prescribed fire applied on a three to ten year frequency.

Wet Prairie (718 acres)
Wet prairie is characterized as a treeless plain with a sparse to dense ground cover of grasses and herbs, including wiregrass, maidencane, spikerush (Eleocharis sp.), and beakrush *(*Rhynchospora sp.). Other typical plants include hatpins (Lachnocaulon sp.), marsh pinks (Rhexia sp.), sundews (Drosera sp.), tickseed (Bidens sp.), wax myrtle, St. John's-wort (Hypericum sp.*)*, and *Panicums* (FNAI 1990).

Wet prairies occur on low, flat, poorly drained terrain and are inundated from 50 to 100 days per year. Wet prairie species have adapted to long periods of drought conditions due to the rainfall seasonality. Soils typically are sands with a major organic component.

In the Lower Reedy Creek floodplain, many locations dominated by wet prairie communities are currently used for cattle grazing. Drainage and seeding for pasture grasses has

significantly altered species composition of these wetlands to bahia and crabgrass (Digitaria sp.). Bladderpod (Sesbania sp.) and tropical soda apple are prominent problem species in drained wet prairie sites. Remnant undisturbed areas in their natural hydrologic state display typical wet prairie diversity. *Wet prairie has a state ranking of "S4?," apparently secure in the state, although it may be rare in some parts of its state range. Global ranking requires further research.* In the LRCMA, this community is susceptible to overgrazing and over drainage.

6.2.1.2 Archeological and Historical Resources

The following archeological and historical resources policy applies to all Land Stewardship-managed lands.

Policy 05.00113.10 Archaeological and historical resources are protected by site identification and inter-agency coordination with the Department of Historical Resources. Land management planning shall include an analysis of archaeological data accompanied by appropriate public education opportunities.

LSP maintains a database of all known archeological and historical sites on District-managed properties. The database is periodically updated through the Florida Department of State, Department of Historical Resources Site File. Due to its sensitive nature, site-specific data is available to District managers, but not the general public.

A search of the Master Site File was conducted in June 2000. The search revealed ten documented archeological and/or historical sites within the LRCMA (Branham 2000). While the existence of documented archeological sites or historical structures does not necessarily mean all of the sites are "significant," their identification and protection still require management attention. Five of the Florida Master File sites were located on District-owned property; and five sites were located on private property, but within the project boundary.

The five sites located on District property were defined as Culture – Prehistoric, unspecified, and consisted of five site types:

- Mound(s)-Prehistoric;
- Artifact Scatter;
- Lithic Scatter/Quarry (Prehistoric);
- Prehistoric Earthworks; and
- Single Artifact.

The five sites located on private property (within the project boundary) were defined as Culture - Twentieth Century American and Prehistoric, unspecified, and consisted of four Site Types:

- Refuse-Historic;
- Single Artifact;
- Artifact Scatter;

- Lithic Scatter/Quarry (Prehistoric).

Since the LRCMA has not been completely surveyed, it may contain unrecorded archeological sites or historical structures (Branham 2000). The Kissimmee Chain of Lakes Land Management Advisory Committee identified one such possible site when it reported the existence of an Indian mound. Conversations with local landowners have revealed the existence of other possible sites. (Applied management actions for archeological and historical resources are detailed in Section 6.3.2.)

Management Objective
- Identify archeological sites and historical structures located within the LRCMA.

Management Action
- Seek contractual and/or non-contractual services from professional archaeologists to survey for archeological sites and historical structures.

6.2.1.3 Soils

Soil morphology within the LRCMA is primarily a function of topographic variation (relative to hydrology) and vegetation. This relationship between relative topography, hydrology, and soil morphology allows categorization of soils into different positions within the landscape (SFWMD & USDA 1999) (Map 13).

Soils within the LRCMA fall into seven distinct categories defined by the Natural Soil Landscape Positions (NSLP) system:
- Flats Soils
- Flatwood Soils
- Knolls
- Made Lands
- Muck Depression Soils
- Sand Depression Soils
- Water

The NSLP contains 909 map units from 16 counties within the SFWMD. This system was developed cooperatively between the District and the Natural Resources Conservation Service. The NSLP grouped South Florida soils into 12 categories based on hydrology, soil morphology, topography, and vegetation. Soil classification descriptions, vegetation associations, soils classification map and data files of NSLP can be accessed on the Internet at: http://*www.sfwmd.gov/org/pld/proj/wetcons/nslp/nslp/documents.htm.*

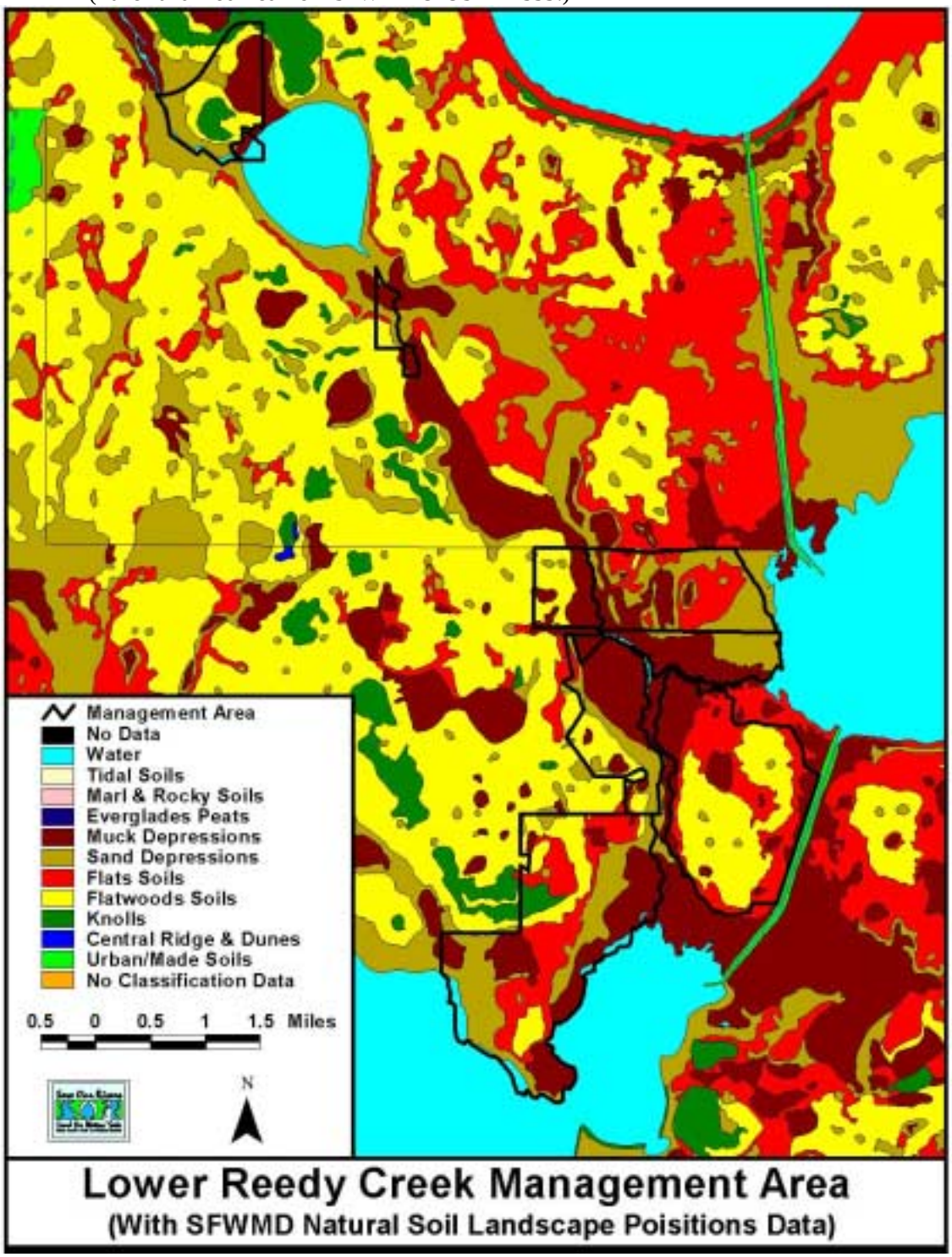
Detailed soil maps for Osceola and Polk Counties (which contain the LRCMA) divide the NSLP soil classifications further into specific categories (USDA 1990; USDA no date). These soil survey books and maps are on file at the District's Orlando Service Center. (Soil management objectives and actions are located in Section 6.3.6)

Flats Soils

Flats soils (previously referred to as slough) are poorly drained hydric soils with sandy marine sediments throughout the profile, or more rarely with loamy sand or sandy loam. Some areas within this unit are frequently flooded alluvial areas that have a sandy surface for the majority of the area. Flats are located between the flatwood and depressional landscapes, and are generally regarded as transition areas. The seasonal high water table can range from the soil surface to one foot below the surface for four to ten months annually. In most years, the seasonal high water table begins in June and ends from September to March (typically by February). Some areas may be inundated for less than a few weeks by large storm events. Examples of these soils include Boca, Felda, and Riviera. Wet-dry prairies dominated by grasses are typical to this landscape position.

One of the ecological communities most typical of the flats landscape is the slough. Slough soils are nearly level and very poorly drained with organic surfaces underlain by sand. Representative soils include Hontoon, Sanibel and Okeelanta. Most sloughs serve as drainage ways for water during periods of heavy and prolonged rainfall. Surface water may move over this area for up to a few weeks during the rainy season. Most sloughs are relatively long and narrow and slightly lower in elevation than the surrounding flatwoods and hammocks. Vegetation within the slough may be open expanse of grasses, sedges and rushes with scattered pines and cypress in an area where the surface soil is saturated during the wet season. Grasses are the most common plant found in sloughs. Other plants that characterize this community are pickerelweed, sundew, milkwort (Polygala sp.), beak rushes, blue maidencane (Amphicarpum muhlenbergianum), and sloughgrass (Scleria sp.).

Map 12: Natural Soils Landscape Positions of the Lower Reedy Creek Management Area (Taken and modified from SFWMD & USDA 1999.)



Flatwood Soils

Flatwood soils are poorly drained non-hydric, upland soils with sandy marine sediments throughout the profile. Most of the soil series have a subsurface spodic horizon, some of which may have loamy sand substrates. The seasonal high water table can range from 6 to 18 inches below the soil surface for three to six months annually. Some areas may become inundated for less than a couple of weeks during large storm events. Examples of these soils include Immokalee, Malabar, and Wabasso. The soils affect plant-water relationships and cause differences in plant composition. Natural communities typical of flatwood soils are dry prairie, mesic flatwoods, and scrubby flatwoods. Typical flatwood soil vegetation includes pine trees with an understory of saw palmetto. Other Common plants are live oak, shiny blueberry, gallberry, tarflower, wax myrtle, chalky bluestem (Andropogon viginicus glaucopsis), and wiregrass.

Knolls

Knoll soils are non-hydric, upland soils with sandy marine sediments throughout the profile. These soils typically have no unique diagnostic horizons within the soil profile and are well to somewhat poorly drained. The seasonal high water table can range from one and a half to six feet below the soil surface for four to seven months annually. Examples of these soils include Archbold, Canaveral, and Pomello.

One ecological community that is typical to the knolls landscape is sand pine scrub. Natural vegetation may typically be even-aged sand pine trees with a dense under-story of oaks, saw palmetto, and other shrubs. Ground cover under the trees and shrubs is scattered. Large areas of light colored sand are often noticeable. Satellite soils, which have a high water table for part of the year, support scrubby growth. Myrtle oak, Chapman oak, and sand pine become infrequent and gallberry becomes prominent. Plants that characterize this community are: Chapman's oak, myrtle oak, sand live oak, sand pine, prickly pear (Opuntia sp.), and panicum (Dichanthelium sp.).

Made Lands

Urban or made land areas have soils that have been altered, excavated, or disturbed and no longer possess their natural morphological features. These soils do not function as they did in their original state, and little information on this subject is available. The seasonal high water table varies by site and is usually controlled to inhibit flooding of developed areas. Common soil series of this landscape position include Arents, Matlacha, Pits, Udorthents, and Urban Land. No ecological communities are representative of this landscape position. Spoil piles bordering the C-36 in the LRCMA fall under this soil classification.

Muck Depression Soils

Muck depression soils are very poorly drained hydric soils that have an organic surface layer underlain by sandy marine sediments. These areas are often depressions adjacent to flats and flatwood landscapes. The seasonal high water table can range from six inches below to two feet above the soil surface for up to 11 months annually. In most years, the

seasonal high water table begins in June and ends between December and April (typically in April). Examples of these soils include Gator, Hontoon, and Sanibel. Some areas within this unit are frequently flooded alluvial areas that have muck surface. These frequently flooded map units are known to have surface flooding at least one out of every two years. A few areas may have a thin organic surface layer less than a few inches thick.

Ecological communities often found in this landscape are basin swamp, dome swamp, strand swamp or floodplain swamp. Typically occurring along rivers, lake margins, slough and strands, these communities may be interspersed throughout other communities such as flats and flatwoods. Water is at or above ground level a good portion of the year. Tree species diversity is low in cypress domes, but increases in cypress strands and along stream margins. Plants which characterize this community are: bald cypress (Taxodium disticum), pond cypress, coastal plain willow, red maple, buttonbush, wax myrtle, cinnamon fern, royal fern (Osmunda regalis), Spanish moss, giant wild pine (Tillandsia utriculata), and maidencane. Some of the protected plants that may be found in these communities include the climbing dayflower (Commelina gigas), fuzzy wuzzy airplant (Tillandsia pruinosa), giant water dropwort (Oxypolis greenmanii), hidden orchid (Maxillaris crassifolia), nodding catopsis (Catopsis nutans), and grass of Parnassus (Parnassia graniflora).

Sand Depression Soils

Sand depression soils are very poorly drained hydric soils that typically have sandy marine sediments throughout the profile. A few areas may have mucky sand, loamy sand, or sandy loam surfaces with sandy or loamy subsurfaces. Often, these areas are depressions adjacent to flats and flatwood landscapes. The seasonal high water table can range from one foot below to two feet above the soil surface for seven to ten months annually. In most years, the seasonal high water table begins in June and ends from October to March (typically in March). Some areas within this unit are frequently flooded alluvial areas that have a sandy surface for the majority of the area. Soils commonly associated with this community are nearly level and very poorly drained with organic surfaces underlain by sand. Flooding at least one out of every two years. Examples of Sand Depression soils include Basinger, Boca, Chobee, Felda, and Riviera.

Natural communities often found in this landscape are the freshwater marsh and ponds. Vegetation varies widely within marshes, and may be composed of: flag, sawgrass, arrowhead, and other non-grass herbs marsh, cattail, spike-rush, bulrush, and maidencane marsh.

Water (open)

Water areas are permanently inundated, usually to a depth of two feet or greater. This includes freshwater, saltwater, natural and excavated sites. There are no soil series associated with this landscape position. Open water areas are represented in areas such as the southernmost termini of Dead River and Reedy Creek.

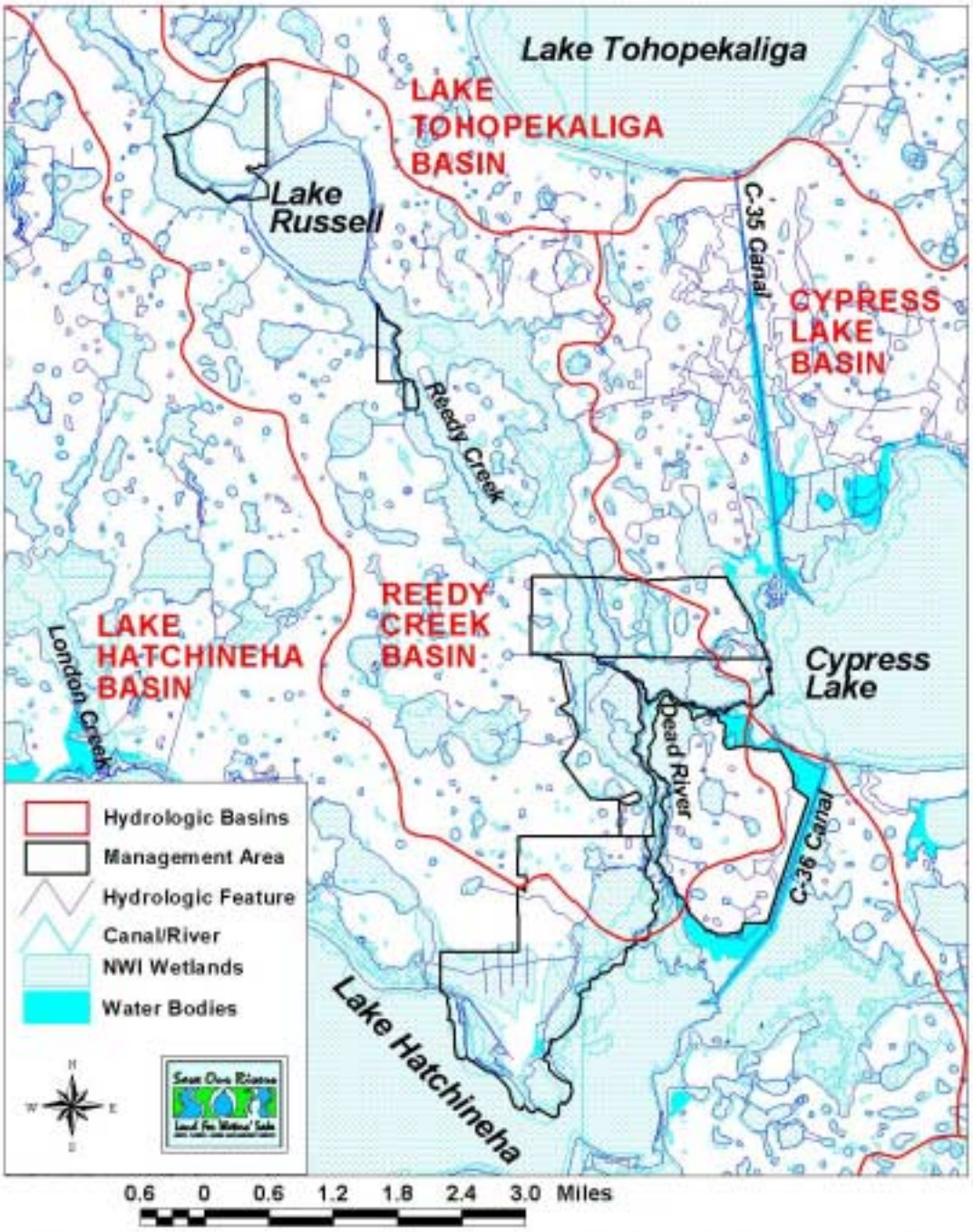
6.2.1.4 Hydrogeology

The Reedy Creek basin is approximately 269 square miles in sections of Lake, Osceola, Orange, and Polk Counties. White (1970) divides the state of Florida into three major hydrogeologic divisions. The northern proximal zone is characterized by continuous high ground that forms a broad upland. The central mid-peninsular zone is defined by discontinuous highlands in the form of sub-parallel ridges and valleys. The southern distal zone is characterized by a broad, flat, gently sloping and poorly drained plain. The LRCMA lies within the central zone. The major geomorphic feature, which affects area hydrology, is the Osceola Plain. The Osceola Plain is a generally broad terrace bounded by the Lake Wales Ridge to the west and the Eastern Valley to the east, both of which are marine scarps. The Osceola Plain has locally little relief and generally has an elevation of 60 to 70 feet NGVD. The LRCMA is located in the middle of the Osceola Plain, slightly west of the centerline roughly parallel with the axis of the peninsula.

Gently sloping elevations and seasonally fluctuating inflow produce slow drainage and periodic overflow onto the creek floodplain. Water flow is delayed by dense wetland vegetation, a widely meandering channel, and organically rich creek substrates. During high rainfall events, water is delivered to the main channel by overland sheetflow. Higher elevations are influenced by fluctuating water levels during the summer months. Water drawdown from elevated areas can be a slow process.

For management purposes, the LRCMA includes two hydrologic basins: the Reedy Creek and the Upper Kissimmee River-Kissimmee Chain of Lakes (Map 14). Upper Kissimmee River-Kissimmee Chain of Lakes basin includes eleven lakes and adjoining watersheds ranging in size from 3.5 square miles to 152 square miles, and encompasses a central basin and an east and west chain of lakes. The Reedy Creek basin includes approximately 25 miles of creek bottom and associated floodplain, beginning in Lake and Orange Counties, flowing south through Osceola County, and ending in Polk County at Lake Hatchineha and Cypress Lake.

Map 13: Hydrologic Basins of the Lower Reedy Creek Management Area



Lower Reedy Creek Management Area Hydrography
(With National Wetlands Inventory Delineations)

6.2.2 Monitoring

The following monitoring policy applies to all Land Stewardship-managed lands.

Policy 05.00113.6b - Monitoring shall be conducted to identify landscape changes resulting from management activities.

LSP has developed a monitoring program to evaluate success of management actions on SOR properties. Tracking environmental response to prescribed fire, hydrologic restoration, and exotic vegetation control provides valuable information on pre-management condition and progress toward land management objectives. Information obtained by monitoring specific sites assists land managers in making sound ecological choices for each unique parcel.

Ecological monitoring on LSP-managed properties is conducted or coordinated by the LSP monitoring coordinator. Monitoring projects and a database of plant and animal resources that occur on management areas are kept on file at the Dupuis Reserve.

The Kissimmee River Restoration Project (KRRP) developed a monitoring program for the Lower Kissimmee River that is integrated with river restoration research objectives. Integration of this monitoring program with monitoring efforts for the LRCMA is essential for the development of a long-term, coordinated management evaluation program. The Kissimmee River Restoration Evaluation Program (KKREP) is designed to collect, manage, evaluate, and disseminate information related to activities, observations, and measurements associated with restoration of the Kissimmee River/floodplain ecosystem. Program components are designed to track initial and long-term responses to the reconstruction of the ecosystem by evaluating a suite of indicators representing physical, chemical, biological, and functional components of the system. Components evaluated include birds, endangered species, fish, herpetofauna, hydrogeomorphology, hydrology, invertebrates, vegetation, and water quality. The KRRP is also developing a database to store sample data for public use.

6.2.2.1 Wildlife Monitoring

Extensive non-District monitoring programs are being implemented within the watershed. The FWC monitors Florida black bears (Ursus americanus floridanus) and one Florida panther (Felis concolor coryi*)* in the floodplain. In the past year, two bears were killed near Lake Tohopekaliga, directly north of lower Reedy Creek (M. Folk, pers. comm., August 4, 1999). TNC will also continue to monitor and map sandhill crane, gopher tortoise, and scrub jay populations and territories.

TNC research and the designations associated with FWC findings illustrate the biological importance of protection efforts in the Reedy Creek watershed. Florida scrub jay surveys (since 1990) have shown fluctuating productivity each year, from 26 chicks reported in 1997 to only two in 1998 (TNC 1999). Gopher tortoise burrows were monitored in 1997, and

restoration of ideal habitat was planned involving prescribed burns (TNC 1999). Numbering between 4000-6000, the Florida sandhill crane's declining population has recently stabilized due to their ability to adapt, and having selected preserved areas (U.S. Geological Survey 1999). Of six pairs of sandhill cranes observed at the Disney Wilderness Preserve in 1998, four produced one chick each. Game populations were also recorded in 1998; white-tailed deer *(*Odocoileus virginianus*)* estimates had increased from previous years, while feral hog *(*Sus scrofa*)* numbers were lower (TNC 1999).

6.2.2.1.1 American Wood Storks

LSP will continue to develop a specific monitoring program for the wood stork colony located in southern Reedy Creek. Aerial monitoring of the colony has been conducted annually by the FWC since May 1977 (FWC 1991). Through a District contract with the Center for Environmental Studies (CES), the University of Central Florida began monitoring the colony during the 1996-97 nesting season. Historically, the storks at Reedy Creek have been faithful to the colony site with a sizeable number of chicks successfully fledged each year (J. Rodgers, pers. comm. May 5, 1999). Nesting wood storks at the creek numbered between 250 and 500 in the 1977-78 breeding season (FWC 1991). Recent monitoring data indicates a decline in the stork population. In 1995, breeding adult wood storks numbered approximately 300 in Reedy Creek; two years later, the number had dropped to only six adults with four chicks fledged (FWC 1997).

Wood storks did not nest in the cypress trees along Reedy Creek during the 1998-99 breeding season, possibly due to extremely low water levels during early 1999. The creek bed became dry in some areas, reducing the availability of fish and other wood stork prey (S. Rallo, pers. comm., May 1999). A similar phenomenon was observed during the 1999-2000 breeding season. In February 2000, approximately 70 active wood stork nests were counted within the colony site. However, it was reported in June 2000 that no nests were present. Year 2001 counts revealed eleven nests. There is a strong tendency for storks to return to historical nesting sites when the hydrologic cycle is favorable (J. Odgen, pers. comm., April 1999). Therefore the absence of storks in any given year does not indicate that the colony site has been permanently abandoned. In all likelihood, storks will return to the site for nesting in years when site conditions are favorable. Jim Rodgers, a biological scientist with the FWC, describes three types of wood stork colonies:

(1) colonies that are active every year and are highly successful
(2) colonies that may be used only one time and never have another record of nesting
(3) colonies that may be used intermittently, depending on water levels and disturbance factors (J. Rodgers, pers. comm., May 5, 1999).

According to Rodgers, Reedy Creek is generally included in the first category, although the 1998-99 and 1999-00 years were exceptions.

Management Objectives

- Track activities of nesting wood storks within the LRCMA.

Management Actions

- Regional land managers shall continue to coordinate with and assist FWC biologists during annual aerial wood stork colony surveys.
- Regional land managers shall monitor wood stork nesting activities from the ground, within the LRCMA, at least monthly from February 15 – August 15 to determine onset and nesting success.

6.2.2.1.2 Bald Eagles

Since the mid-1970s FWC has monitored bald eagle nests within the Reedy Creek area (White 1999b). The District has assisted with the FWC-annual eagle nest monitoring in the lower Reedy Creek area since 1997. Total productivity for five nests within the Merritt Island and Rough Island Management Units indicated a trend towards decreased success (J.White, pers. comm., July 1999). For the 1988-89 season, a total of six eagles fledged with four nests active; during the 1997-98 season, no chicks were fledged from the two active nests, while two other nests were completely inactive.

Annual aerial nest monitoring by the FWC is scheduled to continue and the District will continue to assist their efforts. District personnel will attempt to monitor the area's nests in the 2002-2003 season to determine more accurately the timing of the onset of nesting activities. (Additional management actions for bald eagles are listed in Section 6.3.8.1.)

The District has successfully contracted an eagle management plan for the Upper Lakes Management Area by the Florida Natural Areas Inventory. Plan content includes historical nesting data, nesting success information, current (2001) GSP nest locations, and management recommendations.

Management Objectives

- Track activities of nesting bald eagles within the LRCMA.

Management Actions

- Regional land managers shall continue to coordinate with and assist FWC biologists during annual aerial bald eagle nest surveys.
- Regional land managers shall monitor bald eagle nesting activities from the ground, within the LRCMA, at least monthly from October 1– May 15 to determine nesting onset and success.

6.2.2.1.3 Southeastern Big-eared Bats

Monitoring of the colony on District property began in December of 1994. Light intensity, temperature, and humidity readings in the trailer were analyzed, and researchers looked for other possible roost sites (Finn 1996). Bats leaving the trailer were noted to head east in the direction of Reedy Creek (Finn 1996). Mist and harp nets were set in different areas (some near the trailer, others over the creek) in order to tag bats (Finn 1996). Microclimate data

were compared between ambient, the trailer, and the bat house (Finn 1996). Despite this data collection, the Southern big-eared bat is still a relatively unstudied species, and its habitats are not well understood.

Laura Finn, president of Fly By Night, Inc., has been monitoring Corynorhinus at the lower Reedy Creek site since 1994. An average colony population of 19 big-eared bats were located on District property on the Osceola/Polk county line (Finn 1999b). Most used an abandoned trailer as their primary roosting site, while one or two bats frequently inhabit a bat house constructed by the District in April of 1997.

The colony's average size of 19 was considered to be small in 1999; in 1998 the population varied from 26-52 bats (Finn 1999a). Monitoring and research contracts for the bat colony terminated in the spring of 2000. (Additional management actions for Southeastern big-eared bats are listed in Section 6.3.8.1.)

Management Objective
- Monitor population levels of Southeastern big-eared bats within the LRCMA.

Management Action:
- Regional land managers and the monitoring coordinator shall coordinate with TNC (the primary managers of the site) to develop a long-term strategy for monitoring the Southeastern big-eared bat colony site.

6.2.2.2 Hydrology and Creek Substrate Monitoring

During the week of May 18-22, 1998, researchers from the District and Center for Environmental Studies mapped approximately 500 meters of Reedy Creek, noting the position of large woody debris throughout the channel. The study was conducted to begin assessing the impacts of recreational use on the creek's natural habitat, water flow, and wildlife. The mapping project showed Reedy Creek to be a dynamic ecosystem, with a large number of cypress and red maple trees lying across the creek's corridor. Clearing the creek by removing fallen vegetation may create a cascade of undesirable effects to the environment, such as altering the creek's typical hydropattern and causing other riparian trees to fall into the creek corridor prematurely. Stability of the creek substrate could be compromised as a result, causing changes to aquatic invertebrate habitat that would affect the entire food web.

In the spring of 2000 a follow-up assessment of the creek's woody debris was conducted by District contractors. While some logs and creek substrate had changed positions since 1998, it was not possible to determine the causes of the few changes that were noted.

Management Objective
- Monitor the hydrogeomorphology and creek obstructions within the LRCMA.

Management Actions

- On an annual basis, regional land managers shall visually monitor the creek for changes in vegetation and creek flow patterns.
- The monitoring coordinator shall schedule biannual surveys of the creek to determine changes in creek floodplain and hydrogeomorphology.

6.2.2.2.1 Water Quality

The Water Resources Atlas of Florida (Fernald and Purdum 1998) identified large portions of the Reedy Creek watershed as having "poor" surface water quality. This finding (for watersheds with "poor" ratings) was attributed primarily to inadequate treatment of stormwater runoff.

Management Objective

- Utilize a comprehensive monitoring program in the LRCMA to enable management evaluation.

Management Action

- The monitoring coordinator, supervising land manager, and regional land managers shall develop a formal monitoring program for the LRCMA in coordination with the Kissimmee River Restoration Project.

6.2.3 Research

The following research policy applies to all Land Stewardship-managed lands.

Policy 05.00113.6a - Research shall evaluate the environmental response of certain management activities to assist staff in making appropriate management decisions.

Research activities conducted by the LSP produce practical information directly applicable to land management operations on SOR properties. Land managers assess research needs with the assistance of the LSP monitoring coordinator as they become evident during the progress of land management. A data file of all research projects occurring within SOR boundaries is maintained. LSP research studies are subject to peer review and, when appropriate, made available through publication or distribution on the District computer network server.

Osprey

In late April 1999, biologists from the University of Minnesota's Raptor Center attempted to capture and fix radio transmitters to a pair of nesting ospreys in the Reedy Creek basin, planning to study migration trends of the birds (Palmer 1999). The pair was not captured, as a horned owl decoy failed to intimidate the ospreys from their nest into the net. Researchers planned to return to the area and continue the raptor project in 2000.

American Wood Storks

Wood storks did not nest on Reedy Creek during the 1998-99 season. As such, no research was conducted at the site. A study to determine whether airboating disturbed nesting wood storks at the colony was tentatively planned for the 1999-00 nesting season. After reviewing the study proposal and historical research information, the study was permanently canceled. District staff determined that due to annual variations in weather, hydrology, animal behavior, and ecology at the site, the study would require at least ten study seasons with multiples test sites, control sites, and test parameters. Wood stork nesting within the LRCMA was apparently unsuccessful during the 1999-00 season perhaps due to drought conditions during the latter part of the season. Nesting failure during consecutive years at the site exemplifies site variables would make a study of this kind difficult to implement.

Future applied management actions (as detailed in Section 6.3.8.1) will consequently be based on the best available scientific knowledge, management guidelines, and legal obligations.

Southeastern Big-eared Bats

A study aimed at locating alternative roost sites, foraging areas, and airboat-disturbance for Southeastern big-eared bats was conducted in 1999-2000. During the first of four radio-telemetry tracking sessions in April 1999, four Corynorhinus bats were fitted with transmitters (two males and two females); a total of six big-eared bats were captured and tagged (Finn 1999b). Alternate roost sites were located and foraging patterns studied. Subsequent radio telemetry sessions were conducted in August and November of 1999 and February of 2000 to determine locations of other possible roost sites and to study bat behavior in response to nighttime airboat use (Finn 1999a).

On April 12 and 13, 1999, an airboat was operated in Reedy Creek near the study area during the hours of 6:00 p.m. until midnight. Initial spatial analysis of triangulated data collected on one transmitted bat (#1733) showed a smaller range of activity on the two nights of the airboat runs, with no activity recorded to the east of the creek (Finn 1999b). Data for the April, August, November, and February trials will be consolidated and statistically analyzed before any conclusions are drawn about the effects of airboat traffic on foraging, reproduction, and other behaviors (Finn 1999a).

Management Objective

- Implement research to test hypotheses leading to improved management of and regulations for the LRCMA.
- There are no specific hypothesis-testing research activities planned for the LRCMA.

Management Actions

- Regional land managers, supervising land manager, monitoring coordinator, and inventory coordinator shall identify specific research projects within the LRCMA that are necessary

to evaluate wildlife species and ecological community responses to management and regulations.

6.2.4 Management Review

The following management review policy applies to all Land Stewardship-managed lands.

Policy 05.00113c - Legislative-mandated (H.B. 1119) management review will provide input from professional peers.

GMPs are created following a designated format and provide description of recommended management for each Land Stewardship Management Area. The GMP is updated every five years. Management review teams evaluate management plans and participate in on-site reviews of management practices. Team members consist of the LSP regional land manager, and representatives from FWC, FDEP, Florida Division of Forestry (FDOF), local soil and water conservation districts, local government and private land management interests, and conservation organiziations.

Quarterly reports, produced by the regional land manager, contain information on relevant land management activities of each region, and are circulated within the LSP for review. LSP quarterly meetings address management problems and unresolved issues of the previous quarter, and plan for future management operations.

Management Objective

- Utilize external reviews to evaluate management programs, activities, and results within the LRCMA.

Management Action

- Regional land managers shall coordinate site visits for legislatively mandated review committees, the Kissimmee Chain of Lakes Land Management Advisory Committee, and other management review teams on an as-needed basis.

6.3 Resource Management

Resource management includes all applied programs wherein activities manipulate, modify, and control natural features within the LRCMA. All SOR lands shall be managed and maintained in an environmentally acceptable manner and, to the extent practicable, restored and protected in their natural state and condition. Management responsibilities are defined by statutory law, and directed by best management practices. Goals and objectives for LRCMA (6.1.1) clarify resource management guidelines necessary to fulfill the District's land stewardship responsibilities. Programs consist of agriculture, archaeological and historical, fire, forestry, hydrologic, range, soil, mineral, vegetation, and wildlife management.

6.3.1 Agriculture Management

The LSP occasionally acquires property on which agricultural production had been a primary use. When this occurs, each property is assessed on an individual basis to determine whether agricultural production should continue. In cases where temporary farming is continued, criteria for land use, defined in the Guidelines and Criteria for Interim Use of District Owned Land (Dames and Moore 1998) are followed. The goal of these guidelines is to reduce contamination to ground and surface waters from agricultural activities by complying with best management practices. The basic concept is to practice prudent agriculture without causing degradation to the environment.

Temporary farming is defined as construction and operation of an agricultural surface water management system within a minimum development project area for a limited duration to produce seasonal crops such as vegetables. These farms are considered temporary due to their finite duration as specified by the lease period. After the last crop harvest, the temporary farming activities and water management facilities shall be properly abandoned, permanent cover vegetation shall be reestablished, and the farm site restored to the original hydrologic conditions. Crop production occurs during only one growing season per calendar year. These operations typically involve cultivation of seasonal row crops on lands that are returned to pasture or other passive agricultural uses after the active farming period. Active temporary farming includes planned fallow periods when vegetative cover is grown between the primary crop growing seasons. Sod farming occurs on select areas designated for storm water treatment and administered by lease agreements. This practice is not considered a sustainable use in the LRCMA.

Citrus production is considered a more permanent agricultural procedure and follows a defined set of guidelines regarding pesticide and fertilizer applications, and irrigation systems. In all cases, the lessee is required to abide by the best management practices defined in the Guidelines and Criteria for Interim Use of District Owned Land.

Management Objective

- Ensure proposed agricultural activities within the LRCMA are consistent with District policies, goals, and guidelines.

Management Action

- No agri-business occurs or is scheduled to occur on District-owned lands within the LRCMA.

6.3.2 Archaeological and Historical Resource Management

The following archaeological and historical resource policy applies to all Land Stewardship-managed lands.

Policy 05.00113.10 - Archaeological and historical resources are protected by site identification and inter-agency coordination with the Division of Historical Resources.

Land management planning shall include an analysis of archaeological data accompanied by appropriate public education opportunities.

As a state agency responsible for management of publicly owned lands, the SFWMD is required by law to preserve historical and cultural resources located on SOR properties. The District's management goal is historic preservation by identification, evaluation, documentation, protection, and stabilization of known historic or prehistoric sites. Under Chapter 267, F.S.S., each state agency of the executive branch is under obligation to consider the effect of management actions on historical resources. This statute, along with Rule 1A-32 (research permitting process), Rule 1A-46 (archaeological report standards), and Chapter 872, F.S.S. (protection of gravesites) are the primary laws pertaining to historic sites and archaeological resources. The method of compliance for historic preservation laws is inter-agency coordination with the Florida Department of State, Division of Historical Resources (FDHR) through their project review process (Rule 1A-46, archaeological report standards).

Management Objective

- Protect archeological sites and historical structures located within the LRCMA.

Management Actions

- The five documented archeological and historical sites, located on property owned by the District within the Management Area, will be identified in the field by regional land managers and law enforcement personnel.
- The five documented archeological sites and historical structures located on property owned by the District within the Management Area will be protected from disturbance created by vandalism or land management practices.
- Private landowners will be notified (by regional land managers) about archeological and historical sites located on adjacent properties within the project area.
- As sites may be subject to vandalism, specific locations will not be given to the general public.

6.3.2.1 Historic Resource Management Guidelines

The general management policy of the Division of Historical Resources requires that staff and state land managers closely coordinate all planned activities involving known archaeological/historic sites or potential site areas on state lands to prevent any kind of disturbance. The LSP concurs with this policy and defines the following guidelines to insure preservation of historic sites, and comply with state law.

- *The LSP supports training for at least one staff member as a Florida Park Service Certified Archaeological Monitor. The individual provides guidance to land managers undertaking management actions that could impact historical sites, and acts as liaison to the FDHR.*
- *Potential areas of archaeological significance are investigated by methods and standards recommended by the FDHR.*

- *Prior to conducting major or moderate ground-disturbing activities on SOR property, the land manager will consult the FDHR "Florida Site File" (major or moderate disturbance activities are defined by the FDHR Compliance Review Program). The Florida Site File is a systematic compilation of all known archaeological sites in Florida, located in the Tallahassee office of the FDHR.*
- *If the proposed management action site is suspect of being a historic site, or is a known site, the FDHR Compliance Review Process is initiated. FDHR then determines if the management action of the site is appropriate or requires monitoring by a Certified Archaeological Monitor.*
- *The LSP complies with recommendations provided by FDHR through the Historic Resources Compliance Review Process.*
- *Educational opportunities, that do not threaten the historic resources, are encouraged.*
- *Locations of sensitive areas are not disclosed to the general public for the protection of the resource.*
- *Illegal removal or disturbance of a known archaeological site are the subject of criminal investigation and reported to the FDHR.*
- *Those sites applicable for the National Register of Historic Places status are submitted for review to the National Park Service.*

6.3.2.2 National Register of Historic Places

According to Chapter 267.061 F.S.S., each state agency is required to establish a program to locate, inventory, and evaluate all historic properties under the agency's ownership and assume responsibility for preservation. Any structure over 50 years of age is considered "historic" and is eligible for listing in the National Register of Historic Places. This register is the official list of the Nation's cultural resources worthy of preservation. Authorized under the National Historic Preservation Act of 1966, the National Register is part of a nationwide program to coordinate and support public and private efforts to identify, evaluate, and protect our historic and archaeological resources. The National Register is administered by the National Park Service under the Secretary of the Interior. Properties listed in the National Register include districts, sites, buildings, structures, and objects that are significant in American history and culture.

6.3.3 Fire Management

The following prescribed fire policy applies to all Land Stewardship-managed lands.

Policy 05.00113.3 - Prescribed fire will be a primary management tool on District lands and will be applied within fire maintained communities at appropriate intervals.

Prescribed fire is one of the primary tools used in land management throughout central and south Florida. The majority of natural communities in this region rely on fire to maintain their vegetative characteristics and biodiversity. Prescribed fire regimes attempt to mimic natural fire patterns that historically reduced fuel loads, inhibited hardwood encroachment, stimulated growth in fire-adapted plants, and recycled nutrients back to the soil. However,

unlike a natural wildfire, prescribed fire must be limited to a designated area and performed under defined environmental conditions. In this way, managers reduce the potential for wildfires while restoring natural community structure and function. The LSP recognizes the benefits of fire and has integrated prescribed fire into its land management strategy.

Management Objective
- Maintain vegetative communities with natural fire regimes within the LRCMA.

Management Actions
- The regional land manager shall establish fire regimes that mimic the natural fire cycles of each community present.
- The regional land manager and monitoring coordinator shall establish a monitoring program to assess the effects of prescribed fire.

6.3.3.1 Prescribed Fire Planning and Application

A fire management plan is developed for each management area. The plans include a description of location and natural community types, fire history, fire management objectives for each natural community type, constraints, and field operation burn prescriptions (a sample prescription is located in Appendix C). The LSP bases all fire activity plans on ecological research and best management practices. Fire frequency schedules for each natural community consider recommendations provided in The Natural Communities of Florida (FNAI 1990). Growing season burns (summer) are encouraged and natural firebreaks are used to promote historic fire patterns, avoid soil disturbance, and reduce hydrologic flow disruption. Application of fire, with appropriately timed herbicide treatments, is utilized as a tool for control of invasive plants and is judiciously applied where fire-adaptive exotics are present. Prescribed fire planning is critical when dealing with species such as Melaleuca and Japanese Climbing Fern, which can be spread by fire.

A description of the prescribed fire program for the LRCMA is organized in this plan by community type and management unit. As such, a brief description of each community type's fire regime is given (see Table 3 for a summary) followed by an overview of the prescribed fire programs for the Rough Island, Johnson Island, and Lake Russell Management Units. Prescribed fire programs for the Park Equus, Universal, and McKinney tracts are managed under off-site mitigation programs. Comprehensive Fire Management Plans for all units are located at the District's Orlando Service Center.

6.3.3.1.1 Ecological Community Fire Regimes

Fire in Basin Marshes

Basin marshes that are dominated by herbaceous plants typically experience some fire every three to five years, while Willow/Buttonbush marshes burn every three to ten years (Duever et al. 1976). Exclusion of fire or reduced hydroperiods allow invasions of wax myrtles, saltbush, and exotic woody species while periodic fires increases habitat diversity and foraging opportunities for many species of waterbirds. This community often grades into

flatwoods or prairie areas from which fire probably enters the marsh. Without periodic fire in this community, peat would accumulate, raising the ground level, reducing the water storage capacity, and shifting the community to a hardwood swamp (FNAI 1990).

Fire in Basin Swamps

Fire generally burns into the edges of basin swamps from adjacent communities. Fire frequencies are quite variable in this community. The edges may experience fire every few years while the interior areas may not burn but once every 100+ years. Typical fire intervals may be anywhere from 5 to 150 years. Occasional fires are necessary in basin swamps to maintain their cypress and pine components, and reduce hardwood invasion. Without fire peat would accumulate, hardwoods would dominate and a basin swamp would shift to a bottomland forest.

Cypress and pines are very tolerant of light surface fires, but muck fires burning into the peat can kill the trees, lower the ground surface and transform a swamp into a pond or lake. Prescribed fire is applied to surrounding natural communities when soils within the basin swamps are saturated.

Fire in Depression Marshes

The fire frequency is typically three to ten years, similar to pine flatwoods communities, depending on weather conditions and fuel build-up. Fire preserves the open canopy by limiting invasion of woody vegetation, promoting herbaceous growth, and with the occasional peat fire, slowing succession by deepening the marsh. The LSP coordinates fire schedules to insure depression marshes burn at natural frequencies and during periods of adequate ground moisture.

Fire in Dome Swamps

Fire is essential for the maintenance of a cypress dome community. Without periodic fires, hardwood invasion and peat accumulation would convert the dome into a bog. Dome swamps dominated by bays are close to this transition. Fire frequency is greatest at the periphery of the dome and least in the interior where long hydroperiods and deep peat maintain high moisture levels for most of the year. The normal fire cycle might be as short as three to five years along the outer edge, and as long as 100 to 150 years towards the center. The dome's profile is largely attributable to this fire regime. Cypress is very tolerant of light surface fires, but muck fires burning into the peat can kill them, lower the ground surface, and transform a dome into a pond. In order to prevent peat fires in the Management Area, prescribed fire is applied to surrounding natural communities when soils within the domes are saturated.

Fire in Dry Prairies

Fire frequency, intensity, and fuel build-up determines whether a pine over-story develops. Fire occurs naturally in dry prairies every one to four years, which is slightly more frequent than in mesic flatwoods.

Fire in Hydric Hammocks

Because of their generally saturated soils and the scarcity of herbaceous ground cover, hydric hammocks rarely burn. Fire maintains this community with frequencies of 30 - 100 or more years (Duever et al. 1976). Typically, fire enters this community from an adjacent area during the dry season and burns until it reaches the deepest water. Cypress trees are very fire tolerant as long as the peat around the roots are not ignited. Prescribed burn planning for adjacent natural communities will consider hydrologic conditions of hydric hammocks prior to application of fire.

Fire in Mesic Flatwoods

Plant species of this community are adapted to fire frequencies of one to eight years with occasional fire periods of at least four years, which facilitates pine recruitment (FNAI 1990). Historically, numerous small lightening caused fires occurred in the wet season but most acreages burned in the dry season (Abrahamson and Hartnett 1990). Without frequent fires, pinelands are quickly overcome by hardwood species that close the canopy and reduce ground cover herbs and grasses (Abrahamson and Hartnett 1990).

Fire in Prairie Hammocks

These hammocks tolerate occasional ground fires but shading by live oaks limits understory fuel accumulation. Typically the periphery of prairie hammocks are a dynamic edge where fires from surrounding communities enter the hammock and burn fuel along the edge, stopping when the fuel is insufficient to carry fire. The fire frequency is 25–100 years if enough fuel is present to carry fire through the hammock.

Fire in Scrub

Scrub is a fire maintained community (Fernald 1989; FNAI 1990; Myers 1990), which burns infrequently but violently. A variety of sources state different natural fire frequencies for this community. A range of 10-70 years falls within most predictions (Cox et al. 1987; Fernald 1989; FNAI 1990; and Myers 1990). Fuel buildup is a lengthy process, as vegetation grows relatively slow due to severe environmental conditions. With little fine fuel on the ground, scrub communities do not ignite easily but under dry conditions woody scrub species burn hot and fast. Fire kills scrub oaks and shrubs down to their roots, from which they resprout. Without fire the scrub community would accumulate organic matter and convert to a xeric hammock.

Fire in Scrubby Flatwoods

As a transitional community between scrub and mesic flatwoods, scrubby flatwoods have a natural fire frequency reflecting the transition. Natural fire frequency for this community is at five to 25 year intervals. Sparse ground layer vegetation and relatively incombustible oak litter contributes to slow fuel build-up and extended periods without fire. In the LRCMA, scrubby flatwoods often grade into mesic flatwoods, scrub or dry prairie.

Fire in Wet Flatwoods

Nearly all plants within this community are fire adapted to a frequency of three to ten years (FNAI 1990). Prescribed burning considerations are similar to those for mesic flatwoods. Without frequent fire this community would experience a build up of shrubby undergrowth. Annual litter accumulation minus decomposition is 800 lb/ac (Duever et al. 1976). Thick undergrowth creates heavy fuel loads that if ignited by a wildfire would likely kill the pine overstory. Fire postpones hardwood succession and thins canopy trees, while promoting under-story growth and fire-adapted species. If fire were totally excluded, this community would develop into a hardwood forest.

Fire in Wet Prairies

Typical of a grassland community, wet prairies are fire maintained (Ewel 1990). If deprived of fire, these grass-dominated flatlands succumb to shrub encroachment and are especially vulnerable to wax myrtle infestations. Without fire, annual litter accumulation ranges from 1,200 lb/ac to 2,500 lb/ac (Duever et al. 1976). Fire frequencies of two to four years are appropriate while burns during different seasons may stimulate different plant responses (Duever et al. 1976). Without fire, flooding, grazing or some other disturbance, this community will become dominated by wax myrtles (Myrica cerifera) or saltbush (Baccharis halimifolia) thus reducing species diversity.

Table 3: Natural Community Fire Frequency Summary

COMMUNITY TYPE	FIRE FREQUENCY	DETAILS
Basin Marsh	3 – 5 years	Herbaceous-dominated areas
	3 – 10 years	Willow / button bush-dominated areas
Basin Swamp	~ 2 – 4 years	Around edges of community
	5 – 150 years	In the interior of community
Depression Marsh	3 – 10 years	
Dome Swamp	3 – 5 years	Around edges of community
	100 – 150 years	In the interior of community
Dry Prairie	1 – 4 years	
Hydric Hammock	30 – 100 years	
Mesic Flatwoods	1 – 8 years	
Prairie Hammock	25 – 100 years	
Scrub	10 – 70 years	
Scrubby Flatwoods	5 – 25 years	
Wet Flatwoods	3 – 10 years	
Wet Prairie	2 – 4 years	

6.3.3.1.2 Management Unit Fire Regimes

Johnson Island & Rough Island Management Units

Fuel reduction and ecological burning (mimicking natural fire cycles) are the primary objectives on Johnson Island. Johnson Island contains mostly fire adapted plant communities that burn readily and build up heavy fuels, causing dangerous wildfires. A wildfire burned all units east of the main road in March, 2001. Regular fuel reduction through prescribed burning reduces liability risks, fire suppression costs, and damage to fire sensitive areas. Prescribed burning will also benefit the plants and animals living in these fire dependent communities. Prescribed burning has been conducted by the District since 1992 (Table 4).

Rough Island-North

This unit encompasses the land north of Reedy Creek and south of the Southport Ranch, Inc. boundary. The unit will be burned on a two to four year rotation. Fuel reduction and ecological burning are primary objectives in this area. Prescribed fires can be conducted throughout the year. Fuel reduction will primarily occur in the winter months and ecological burning in the spring and early summer. Frequency and timing of burns will be determined in relation to other management activities and water levels on the chain of lakes. Existing access roads will serve as control lines during prescribed fires and wildfires. Wildfire suppression actions will attempt to avoid hydrologic changes and minimize disturbance of natural areas.

Rough Island-South

This unit encompasses the land south of Reedy Creek and east of Dead River. The unit was prescribed burned in 2001, and will be burned on a two to four year rotation. Fuel reduction and ecological burning are primary objectives in this area. Prescribed fires can be conducted throughout the year. Fuel reduction will primarily occur during winter burns while ecological burning will take place in the spring and early summer. Frequency and timing of burns will be determined in relation to other management activities and water levels on the chain of lakes. Existing access roads will serve as control lines during prescribed fires and wildfires. Wildfire suppression actions will be directed to avoid hydrologic changes and minimize disturbance of natural areas.

Lake Russell Management Unit

Fuel reduction and ecological restoration are primary objectives on Lake Russell. Fire exclusion appears to be the cause of heavy fuel buildup in many of the plant communities. Most of the upland communities are fire adapted. Regular fuel reduction through prescribed burning is important due to the close proximity of this property to residential developments and a major roadway. Prescribed fire reduces liability risks, fire suppression costs, and damage to fire sensitive areas. Prescribed burning will also benefit the plants and animals living in these fire dependent communities.

Prescribed fire can also be used to restore and maintain the natural condition of the plant communities on Lake Russell. Each plant community has its unique natural fire regime, restoration goal, and management needs. Much of the interior of the property is scrub and pine flatwoods, and requires fire. The gopher tortoise is one species that would benefit from prescribed fire. Many rare animals are commensal with gopher tortoises and their burrows (i.e., sand skink (Neoseps reynoldsi) and gopher frog (Rana capito).

Nine of the fifteen units were burned in 1997 due to favorable north/northwest winds. The interior scrub island and three unburned units were completed in 2001. All of the mesic flatwoods units were reburned in 2001.

Management Objectives

- Use prescribed fire to restore and maintain the natural state and condition of the plant communities on Rough Island, Johnson Island, and Lake Russell Management Units.
- Control the invasion of woody plants (especially wax myrtles), encourage native plant recruitment and diversity.
- Burn all scrub units at least once and the mesic flatwoods units for a third time by 2007.

Management Actions

- Regional land managers shall cooperate and coordinate with the Division of Forestry, the grazing lessees, The Nature Conservancy, and/or the District fire crew, on all future prescribed fires within the LRCMA.
- Due to liability concerns, the grazing lessees will not be allowed to conduct burning without the direct approval of the District.
- Within Johnson Island, most of the basin marsh and wet prairie (units 3, 7, 15 -18 and 20) will be re-burned over the next three years starting in 2002. (Units 3, 15 and 16 are priorities.)
- Within Johnson Island, the pine flatwoods units (1, 4, 5, 7, 8 – 10) will be re-burned prior to 2006.
- District staff shall burn the Rough Island-North Unit in 2002.

6.3.3.2 Prescribed Fire Safety Standards

Florida fire safety standards and associated administrative rules outline accepted forestry burn practices and are administered through FDOF. The LSP has a six-man prescribed fire crew and may utilize cooperating agency staff, such as FDOF and FWC, in prescribed fire applications on SOR lands. LSP's certified prescribed fire boss and Land Stewardship Field Crew work with regional land managers to implement fire management plans. Prescribed fire planning and proactive wildfire reduction techniques result in improved natural plant communities and provide a safer environment for the public.

Management Objective

- Implement safe prescribed fire operations.

Management Action

- Prescribed fires shall be executed using safety measures as defined by the Prescribed Burning Act of 1990, 590.026, F.S.S.

6.3.3.3 Fire History - Lower Reedy Creek Management Area

Recent fires within parcels owned by the District in the LRCMA were both prescribed burns and wildfires. Dates and locations of prescribed fires and wildfires are recorded (Table 4) to ensure that units are burned under recommended ecological rotations (Table 3). Most units have experienced at least one fire since District acquisition. The prescribed fire program will apply fire to unburned units, and maintain natural fire regimes in all units.

Table 4: Fire History for the Lower Reedy Creek Management Area

Property	Prescribed Fire Date	Fire Management Unit Number	Acres
Johnson Isl.	Wildfire 3/2001		75
	1994, 2001	2	29 (45)
	1992, 1995,2001	3	102
	1992, 1995, 1999,2001	4	25
	1992, 1997, 1999,2001	5	16
	1992, 1994,2001	6	36, 63
	2001	7	
	1992, 1995	8	17
	1992, 1995, 1999,2001	9	[17]
	1992, 1997, 1999,2001	10	55
	1997	11	16
	1992, 1994,2001	12	30, [63]
		13	(22)
	2001	14	
	1992, 1995,2001	15	30, 120
	1995	16	[120]
	1995,2001	17	63
	1994	18	190
	1992, 1994	19	85, 50
		20	
Rough Is. N.		North	
Rough Is. S.	1995,1999,2000,2001	South	600-1000
Lake Russell	1997	1-1	(80)
	1997	1-2	18
	1997	1-3	49
	1997	1-4	
	1997,2001	2-5	20 (50)
	1997,2001	2-6	11
	2001	4-7	61 (60)
	2001	4-8	17
	1997,2001	2-9	9
	1997,2001	4-10	10
	1997,2001	2-11	53
	2001	3-12	6 (60)
	2001	3-13	8
	1997,2001	3-14	4
	1997,2001	3-15	5

6.3.3.4 Wildfire Suppression and Control

The following wildfire suppression policy applies to all Land Stewardship-managed lands.

Policy 05.00113.4 - The Division of Forestry will be notified of all wildfires on District lands. The Land Stewardship Program will provide initial suppression when commensurate personnel and equipment are available.

Wildfires ignited by lightning are a common occurrence throughout Florida. It is standard District procedure, and State law, to notify the DOF, local county fire department, and District emergency management personnel when a wildfire occurs on LSP-managed properties.

The DOF regional office that is responsible for Lake Russell, Merritt Island, and Rough Island-South (in Osceola County) is located in Orlando. The Osceola County Fire Station responsible for the same area is based out of Kissimmee. The FDOF regional office that is responsible for Johnson Island, Rough Island-North, and Rough Island-West is located in Lakeland. The Polk County Fire Station responsible for the same area is based out of Bartow. Contact information for the Division of Forestry and the county fire departments is located in Appendix A.

Management Objective

- Safeguard District property, private property, and the public--in and around the LRCMA--from wildfires.

Management Action

- The Land Stewardship Field Crew and land managers may respond to, or assist in, wildfire suppression on Land Stewardship-managed properties under the direction and/or request of the FDOF and/or local county fire departments.

6.3.4 Forestry Management

The following forestry policies apply to all Land Stewardship-managed lands.

Policy 05.00113.6c - Timber sales will be conducted to improve forest health or support specific forest management goals.

Policy 05.00113.8 - Sustainable use of forest resources shall be conducted where these activities adhere to a series of environmental criteria that meet Land Stewardship Program goals. Timber contractors will be required to meet silvicultural best management practices developed for Florida forests.

Since SOR properties are designated multiple-use, forest management is considered an appropriate land management option. In 1997 the LSP contracted the expertise of Natural Resource Planning Services, Inc. to provide site evaluations and management/harvest

recommendations for existing stands. The subsequent SOR Forest Management Plan (David 1998) identified lands currently managed by the LSP that contain sustainable forest resources capable of generating short term revenues to supplement land management costs. Based on the strict set of environmental criteria outlined above, no sites within the LRCMA were identified as viable timber harvest sites.

Lands that qualified for this program met the following environmental criteria:

- *The area is currently in an improved or disturbed state (i.e. bahia pasture, existing pine plantation).*
- *The site to be planted is not scheduled for future hydrologic restoration, or site to be harvested is scheduled for hydrologic restoration and existing timber will be lost as a result of flooding.*
- *The area does not contain any valuable resources (e.g. endangered species) that may be harmed by changes in land use.*
- *Forest operations would not require major road construction or improvement for accessing and processing timber, particularly within or across wetlands or other sensitive plant communities.*
- *The area to be managed currently requires maintenance (i.e. burning, mowing). District costs that would be reduced as a result of inclusion in the forest management plan.*
- *The area contains timber that requires salvage following fire and/or insect or disease damage, and could be subject to a sanitation harvest with minimal environmental impact.*
- *The area provides special needs for endangered species (i.e. red-cockaded woodpecker) management that requires timber stand improvement.*
- *The area is located such that harvest or planting will not create an aesthetically unpleasant scene or an impediment to public use.*

Management Objective

- Ensure future forestry operations within the LRCMA are consistent with District policies, goals, and guidelines.

Management Action

- One timber harvest is in effect for the Johnson Island Unit as of November 2001 (C-12090).

6.3.5 Range Management

The following range management policy applies to all Land Stewardship-managed lands.

Policy 05.00113.9 - Range management and grazing will be considered on improved or native ranges when the introduction of cattle will not conflict with other natural resource management and public use goals.

Livestock grazing has occurred over the last half century within the Reedy Creek and Kissimmee Chain of Lakes. Many upland areas have been converted to cattle range by

seeding with preferred pasture grasses of bahia and pangola. *Cattle grazing is used by the District and other land management agencies as a management tool, particularly for the reduction of fire fuel loads and maintenance of open range. The decision to open an area to grazing is evaluated in light of the negative environmental impacts often accompanying cattle introduction. Cattle are vectors for non-native invasive plants, particularly bladder-pod (Sesbania sp.) and tropical soda apple (Solanum sp.). Trampling and grazing of sensitive native ground covers select for rhizome-prolific grasses and often result in dominance of non-native, early successional species. By reducing under-story plant densities, grazing eliminates natural fire patterns that would otherwise define historic plant community types. In addition, costs are incurred for exclusion fencing of sensitive environmental areas.*

6.3.5.1 Grazing Lease Agreement Parameters

The following grazing lease policy applies to all Land Stewardship-managed lands.

Policy 05.00113.6d - Grazing leases will be encouraged on selected range land to generate revenue or to provide services that offset program management costs.

The District may lease grazing rights to members of the public, or as a lease-back to the original owner when the property is acquired. Lease terms are based on the number of acres grazed and agreement to certain management responsibilities that may include exotic plant control, feral pig removal, and/or fence construction. Livestock operations should conform to the guidelines defined in the publication Guidelines and Criteria for Interim Use of District-owned Land (Dames & Moore 1998). The District limits certain activities deemed detrimental to the environmental integrity of each parcel leased, with each lease customized to ensure best management practices. Leased SOR lands are returned to the County property tax rolls, and their taxes are the responsibility of the lessee. Leases are re-evaluated at the time of termination with consideration to the LSP management goals and objectives.

6.3.5.2 Current Lease / Reservation Agreements

Two parcels within the LRCMA are under lease or reservation agreements for cattle grazing, totaling 2,423 acres. One area (approximately 1,400 acres) is under consideration for cattle leasing. Table 5 summarizes the current cattle lease/reservation scenarios.

Table 5: Cattle Leases & Reservations in the Lower Reedy Creek Management Area

UNIT	HOLDER	ACRES	START DATE	END DATE
Rough Isl-N	D. Kelley	690	1997	12/2018
Rough Isl-S	J. Overstreet	1733	12/1991	12/2016
Johnson Isl	To be determined	~1400	To be determined	

Management Objective

- Implement range management programs within the LRCMA that minimize impacts to ecological conditions and/or functions of the area.

Management Actions

- Coordinate grazing lessees, U.S. Natural Resource Conservation Service, and the local soil and water conservation districts to develop range management plans for each grazed management unit.
- Coordinate semi-annual site inspections to each area to ensure compliance with the range management plans and to evaluate range conditions.
- Initiate and implement a new grazing contract for the Johnson Island management unit.

6.3.6 Soil and Mineral Management

Substrate conditions, soil contours, and rainfall are integral parts of sustaining natural hydroperiods and associated natural communities. LSP occasionally acquires property with soils impacted by mining operations or cattle dipping areas. Soil contamination and hydrologic alterations created by these uses are of primary concern and, depending upon site conditions and severity of impact, affected locations are subject to a range of restorative measures.

6.3.6.1 Soil Contamination Site History

A review of pre-acquisition Phase I Environmental Assessments for the Lake Russell, Rough Island-North, and Rough Island-South Management Units revealed no major soil contamination sites. (Merritt Island, Rough Island-West, and Johnson Island Unit Environmental Assessments were not available at the time of publication.) A small area within Rough Island-North had been impacted by diesel fuel, apparently spilled from a temporary water pump. This area was remediated prior to acquisition. No cattle dipping vat sites or spray pens were noted within the management units.

There are no known historical cattle dipping vat sites or spray pens within Lower Reedy Creek parcels owned by the District. However, because of their prevalence throughout the region and the possibility sites may be present on future acquisition parcels, a review of remediation efforts is given here.

6.3.6.2 Cattle Dipping Vat Corrective Action Criteria

In February 1994, the SFWMD's Governing Board authorized entering into a memorandum of understanding with the FDEP to:

- *Evaluate the need for cleanup of cattle vats on lands required for the Kissimmee River Restoration Project.*
- *Cooperate with the FDEP in its effort to secure third party funding for the cleanup.*
- *Provide reimbursement funds to the SFWMD from the Water Management Lands Trust Fund for the cleanup.*

The SFWMD has implemented appropriate corrective actions leading to closure or no further action status at properties within the Management Area that contain cattle dipping vat sites. Corrective actions at cattle dipping vat sites were based on adequate cattle dipping vat site characterization, an assessment of human and environmental risk, and consideration of future land use of the site.

The SFWMD agrees to maintain land use at these properties consistent with the current exposure scenario, particularly with regard to the nature, frequency and duration of human contact with soil at the site. Two current exposure scenarios, Restricted I and Restricted II apply, depending on site conditions. Exposure scenario refers to the probable frequency of human visitation to the site. This classification system is based upon human contact with the upper two feet of soil. The greater likelihood of human contact, the greater the exposure and risk to human health. Restricted I scenario allows extensive but less than full-time contact with the site. Permissible activities include parks or recreation areas that receive heavy use (for example, soccer and baseball fields), park or picnic areas close to residential areas and agricultural sites where farming practices result in moderate site contact (approximately 100 days per year). Restricted II scenario mandates infrequent site contact. Land uses consistent with this exposure scenario include campgrounds, state parks, hiking trails and agricultural sites where farming practices result in very limited site contact (two weeks total per year, or less).

Management Objective

- Safeguard the public, wildlife, and environment from negative factors associated with cattle dips within the LRCMA.

Management Actions

- Ensure that no buildings, structure, or agricultural practices will be constructed, maintained, or permitted at sites within a one-quarter mile radius of historical cattle-dipping vat sites.
- Ensure that no installation of wells for potable water purposes will be conducted at sites within a one-quarter mile radius of historical cattle-dipping vat sites.
- Notify the FDEP of any changes in use of any of the sites that would result in their being managed or otherwise used in any manner inconsistent with the current management status.
- Notify FDEP prior to taking any agency action to sell, lease, or otherwise transfer any of its interest in any of the sites.

6.3.6.3 Mineral Management

Mineral management on Land Stewardship-managed properties consists of the protection and wise use of substrate components, with consideration to resource type, abundance, and environmental sensitivity. Mining for minerals, such as phosphate mining, sand mines, and rock-mining operations are high impact activities that impose profound hydrologic impacts and long-term environmental alterations. Mining locations are examined to determine the

practicality of restoration to original hydrologic conditions. Those suitable for continued operations are subject to lessee guidelines defined in the Guidelines and Criteria for Interim Use of District Owned Land (Dames and Moore 1998).

Management Objective

- Ensure future mining operations within the LRCMA are consistent with District policies, goals, and guidelines.

Management Action

- There are no functioning or planned mining operations located within Management Area.

6.3.7 Vegetation Management

The following vegetation management policy applies to all Land Stewardship-managed lands.

Policy 05.00112.4 - Where practicable, an attempt shall be made to restore and maintain desirable vegetation to promote habitat diversity in areas where exotic/invasive vegetation or improved land uses have substantially altered the historic landscape.

6.3.7.1 Listed Plant Species

The following species management policy applies to all Land Stewardship-managed lands.

Policy 05.00112.2 - Particular emphasis shall be placed on the identification, protection and management of rare, threatened, and endangered species.

Listed species are those plants and animals considered rare within a specific geographic area by the USFWS, FWC, or FNAI. A list of these species is annually updated and published by the FWC. The LSP promotes the perpetuation of listed plant species by utilizing best management practices in natural communities to which they are endemic. The establishment of appropriate fire and hydrologic regimes, and the control of invasive plants provide opportunity for rare species to perpetuate or re-establish in former natural ranges. Public Use Rules aid in the protection of native habitat and specifically prohibit the destroying, defacing or removing any natural feature or native plant on SOR lands (40E-7.537, F.A.C.). In this manner, listed plants are given lawful protection and environmental conditions suitable for their continued existence.

Plant inventories have documented three State endangered, three State threatened, three State species of special concern, one Food & Drug Administration-commercially exploited, and two FNAI-ranked species within the LRCMA (Appendix D). A District contractor has completed the Rough Island plant inventory in 2001, and will be contracted for Johnson Island prior to 2005. Completion of inventories at Johnson and Rough Lslands will result in a comprehensive species list.

Management Objective
- Protect and perpetuate listed plant species within the LRCMA.

Management Actions
- Regional land managers and the inventory coordinator shall coordinate with contracted specialists to ensure that all areas within the Reedy Creek Management Area have been surveyed for listed plant species.
- Regional land managers, inventory coordinator, monitoring coordinator, and law enforcement officers shall make in-field identification of sites where listed plant species are present.
- Regional land managers shall ensure that listed plant species locations are protected from vandalism or inappropriate management activities.
- Regional land managers shall identify and implement activities that perpetuate listed plant species identified within the Management Area.

6.3.7.2 Maintenance

The following vegetation management policy applies to all Land Stewardship-managed lands.

Policy 05.00113.12 - Mechanical equipment may be used in conjunction with prescribed burning and other management tools to control vegetation and restore habitat structure.

Land managers use prescribed fire, mowing, chopping, chemical application, and tree harvesting as management tools to reduce fuels, promote fire-dependent plants, reduce exotic and nuisance infestations, stimulate herbaceous species growth, and improve habitat for wildlife and rare plant species. Hydrologic enhancement is employed in areas previously drained for agricultural use with many of the same benefits.

6.3.7.3 Nuisance and Exotic Vegetation

The following exotic plant management policies apply to all Land Stewardship-managed lands.

Policy 05.00112.3 - Planting of exotic/invasive plant species shall be prohibited in all management areas. Management practices will strive to identify existing infestations and implement appropriate control or eradication measures.

Policy 05.00113.2 - Exotic plant control in all management areas shall attain a level of success where periodic maintenance eliminates the infestation or reduces the spread of exotic plants.

LSP targets non-native plant species designated as Category I and II on the Exotic Pest Plant Council's annually updated list of Florida's Most Invasive Species. Category I species include alien plants that invade and disrupt Florida native plant communities. This designation is without regard to economic severity or geographic extent of the problem. Category II exotics have the potential to invade and disrupt natural successional processes. They are similar in geographic origin and ecology as Category I species, have a tendency to form large vegetative colonies and/or are sporadic, but persistent in their occurrence.

LSP's invasive exotic plant control measures include combinations of herbicide application, prescribed fire, roller chopping, and mowing. Selection of control measures is dependent upon species type, environmental factors and natural communities impacted. Treatments are coordinated with the LSP Exotic Plant Control Coordinator and performed by regional land managers, the Land Stewardship Field Crew, lead management agency, or private contractors. The LSP works in cooperation with the District's Vegetation Management Division to coordinate eradication of noxious exotics, and assist with exotic control research efforts whenever possible.

Plant inventories have documented 14 exotic species within the LRCMA (see Appendix D for a complete plant list):

- Camphor tree (Cinnamonum camphora)
- Sour orange (Citrus aurantium)
- Bermuda grass (Cynodon dactylon)
- Water hyacinth (Eichhornia crassipes)
- Chinaberry (Melia azedarach)
- Bahia grass (Paspalum notatum)
- Water lettuce (Pistia stratiotes)
- Guava (Psidium guajave)
- Indian cupscale grass (Sacciolepis indica)
- Chinese tallow tree (Sapium sebiferum)
- Brazilian pepper (Schinus terebinthifolius)
- Turkeyberry (Solanum torvum)
- Tropical soda apple (Solanum viarum)
- Caesar weed (Urena lobata)
- Air Potato (Dioscorea bulbifera)
- Bladderpod (Sesbania punicea)

Exotic plant management within the area consists of follow up treatments to maintain minimum population levels or further reduce populations of exotic and nuisance native plants. The follow-up treatments may be conducted on an annual basis by District contractors, on an as-needed basis by grazing lessees, or directly by District staff.

Management Objective

- Reduce the presence, spread, and associated negative effects of exotic and invasive plant species located within the LRCMA.

Management Actions

- Johnson and Rough Island Management Units: Tropical soda apple shall be the primary exotic plant species targeted for mechanical and chemical removal. Other species include Brazilian pepper, Chinese tallow, and guava. Tropical soda apple shall be controlled by foliar herbicide application while bladder pod (Sesbania sp.) shall be controlled through mowing. The primary means of eradication for Brazilian pepper shall be herbicide application by cut stump or basal bark treatment. Wax myrtle is a native nuisance species that occurs in the historical marsh areas of the management units. This plant shall be controlled using prescribed fire and mechanical removal.
- Rough Island-West Management Unit (McKinney tract): Bladder pod and wax myrtle are the major problem plants targeted for eradication by contrators GOAA/PBS&J. Bladderpod populations shall be reduced by repeated mowings, prior to seed production.
- Lake Russell Management Unit: Air potato is the primary exotic plant species targeted by chemical removal. Other targets in the area include Brazilian pepper and Chinese tallow.

6.3.8 Wildlife Management

The District is committed to the protection and conservation of wildlife resources. A prime requisite in managing these public lands is to ensure that the water, fish and wildlife populations, native plant communities and related resources are maintained in an environmentally acceptable manner (SFWMD 1999a). (Details of wildlife inventory, monitoring, and research activities can be found in Section 6.2.)

Management Objective

- Maintain and/or improve native wildlife habitat.

Management Action

- Regional land managers shall coordinate and cooperate with FWC and USFWS (for listed species) during the development and implementation of wildlife management programs.

6.3.8.1 Nongame and Listed Wildlife Species

The following species management policy applies to all Land Stewardship-managed lands.

Policy 05.00112.2 - Particular emphasis shall be placed on the identification, protection, and management of rare, threatened, and endangered species.

All species listed under the federal Endangered Species Act receive protection from takings, including the detrimental alteration of habitat. In addition, federal agencies are required to protect endangered and threatened species by ensuring that federal projects do not jeopardize their continued existence (Endangered Species Act, 16 U.S.C. § 1536).

Wildlife inventories have documented federally, state, and FNAI-listed species (endangered, threatened, species of special concern, and rare) occurring within the LRCMA (Appendix E – H). The distribution of listed species is summarized in Table 6.

Table 6: Number of Documented Listed Animal Species for the LRCMA

Species	Endangered		Threatened		Species Of Special Concern	FNAI Listed
	Fed	State	Fed	State		
Birds	2	2	3	5	6	19
Mammals					1	2
Herpetofauna	1			2		1
Fish						

Confirmed listed wildlife include the American woodstork, American bald eagle, crested caracara, American alligator, gopher tortoise, scrub jay, Sherman's fox squirrel, swallow-tailed kite, sandhill crane, peregrine falcon, snowy egret, and osprey.

Management Objective

- Complete specific land management projects beneficial to protected species.

Management Actions

- Regional land managers shall conduct management activities following guidelines for the protection of listed species as determined by the Multi-species Recovery Plan for the Threatened and Endangered Species of South Florida, Volume 1, (USFWS 1999e) and recommendations by the FWC.

Management emphasis concerning rare and/or listed wildlife species within the LRCMA has centered around three species: the American wood stork, the bald eagle, and the Southeastern big-eared bat.

American Wood Storks

A nesting colony (# 612048 as identified by the FWC 1991) of American wood storks is located within the Rough Island Management Unit of the LRCMA. The wood stork is a colonial wading bird, generally found socializing with other storks or wading birds. Nesting occurs in wetlands throughout the Southeastern United States. Although several coastal states are used as breeding sites, Florida maintains the largest population of wood storks (Ogden 1985).

In central Florida, wood storks initiate nesting in February or March, lay eggs until late May, and usually fledge chicks by July or August (USFWS 1999b). Being tactile feeders, the

successful breeding of wood storks depends upon their ability to easily locate a large amount of prey (Depkin et al. 1992). This requires water levels between 2 and 15 inches to concentrate prey in small areas (Ogden 1996). Thus, the breeding success of these birds depends on (among other things) the seasonal cycle of flooding and drying of their habitat (Netherton 1994).

The population of wood storks in the United States has decreased significantly, from more than 20,000 breeding pairs in the 1930s, to between 5,000 and 6,000 pairs in the mid-1970s (Ogden et al. 1987). On February 28, 1994, the United States Fish and Wildlife Service (USFWS) listed the wood stork as an endangered species, having federal protection under the Endangered Species Act of 1973. The Migratory Bird Treaty Act provides protection for the wood stork from takings and harassment as well. The bird is also listed as endangered by the FWC and the FCREPA (Rodgers et al. 1996).

There will not be an attempt within this document to recount the complete life history, biology, or habitat needs of wood storks. The presence of wood storks within the Rough Island Management Unit is documented in detail (see Section 6.2.2.1.1). This section outlines historical measures taken by the District to protect wood storks, and the laws, recovery actions, management practices, and management zone recommendations that steers future management decisions.

SFWMD regulations (for the period 1997-2001) governing public access to the southern terminus of Reedy Creek within the Rough Island Management Unit, restricted human activity within 100 meters of the historical wood stork colony 24 hours a day between February 15 - August 15 (SFWMD 1999a). Closure dates established in the rule were determined based on the breeding and nesting season, and sought to provide a temporal buffer to permit wood storks to enter the creek earlier and begin nest building, as well as to allow chicks extra time to successfully fledge. A summary of management zone recommendations for wood storks is given in Table 7.

In the past, the storks have nested directly north of the Reedy Creek-Dead River divergence. However, wood storks are highly mobile and may roost at other locations along the creek. Concern has been raised about protection of feeding and roosting sites for wood storks during the non-nesting season. Appendix L lists pertinent statutes, laws, and recommendations for wood stork management. (See Section 6.2 for inventory, monitoring, and research programs related to wildlife.)

Table 7: Summary of Management Zone Recommendations for Wood Storks
(Taken from U.S. Fish and Wildlife Service 1997.)

SITE TYPE	ZONE TYPE	DISTANCE	PARAMETERS OF SITE	ACTIVITIES RESTRICTED YEAR ROUND	ACTIVITIES RESTRICTED WHILE ACTIVE
Colony Sites	Primary Zone	Within 300 ft			- Human entrance
		Within 500 ft			- Aircraft operation
		Min. 500 ft In all directions from site	IF Strong visual or aquatic barriers exist	- Vegetation removal (incl. lumbering) - Reductions in water levels - Construction	- Increases in human activities - Increase in animal/livestock activities
		1000– 1500 ft In all directions from site	IF No visual or aquatic barriers exist	- Vegetation removal (incl. lumbering) - Reductions in water levels - Construction	- Increases in human activities - Increase in animal/livestock activities
	Secondary Zone	1000– 2000 ft from Primary Max. 2500 ft in all directions from site beyond the Primary Zone			- Increases in human activities above historical levels - Hydrologic alterations that affect Primary Zone - >20% decrease in wetlands and/or woods valuable for roosting & feeding
		1 mile	Open country or wetlands		- High-tension power lines
		3 miles			- Tall transmission towers
Roosting Sites		500 – 1000 ft			- Human activities, when storks are present
Feeding Sites		300 ft	IF Solid vegetative screening exists	- Unnatural water changes - Use of contaminants, fertilizers, or herbicides	- Human activities, when storks are present
		750 ft	IF No vegetative screening exists	- Unnatural water changes - Use of contaminants, fertilizers, or herbicides	- Human activities, when storks are present
		1 mile	Open country or wetlands	- High-tension power lines	
		3 miles		- Tall transmission towers	

Management Objective

- Protect nesting, roosting, and foraging wood storks located within the LRCMA.

Management Actions

- Implement management practices that are beneficial for wood storks.
- Recommend management practices that are beneficial for wood storks.
- Avoid implementing management practices that adversely affect wood storks.
- Propose management strategies that avoid adversely affecting wood storks.

- Ensure 300 and 500-foot colony site primary zone activities are restricted as per the Habitat Management Guidelines.
- Identify a 1000 - 2000-foot colony site secondary zone; ensuring activities are restricted as per the Habitat Management Guidelines.
- Develop a plan to identify roosting and feeding sites, and seasonal usage patterns for wood storks within the Rough Island Management Unit.
- Ecommend implementing management zone protection for identified wood stork roosting and feeding sites.

Bald Eagles

An indepth eagle survey of the SOR Upper Lakes Management Area was completed by FNA1 (contract #3491) in January 2002 (7.4.1).

The bald eagle is a large raptor that tends to use the same nesting site each year (USFWS 1987). Nests average two eggs and incubation lasts approximately 35 days (USFWS 1999c). The nesting season in the Southeast is between October 1 and May 15 (USFWS 1987). During the first 12 weeks of the breeding cycle, disturbance is most damaging, possibly resulting in eagle pairs abandoning their nests and exposing eggs or chicks to the elements.

On July 12, 1995, the bald eagle was reclassified from the federal status of endangered to threatened (USFWS 1999c). The state of Florida and the FCREPA also list the bald eagle as threatened (Rodgers et al. 1996). A direct correlation exists between the ban of dicloro-diphenyl-trichloroethane (DDT) in the United States on December 31, 1972, and the subsequent population increases of bald eagles (USFWS 1999d). Since 1963 the population has risen from 417 nesting pairs to almost 5800. As a result, in 1999, the USFWS proposed the removal of the bald eagle from the Endangered Species List (Federal Register 1996). Research and monitoring will continue for at least a year (through 2000) before the bald eagle will be defined as "recovered" and removed from the list (J.White, pers. comm., July 1999a).

There will not be an attempt within this document to recount the complete life history, biology, or habitat needs of bald eagles. The presence of bald eagles within the Rough Island and Johnson Island Management Units is documented in detail (see Section 6.2.2.1.2). This Section outlines historical measures taken by the District to protect bald eagles, and the laws, recovery actions, management practices, and management zone recommendations that will steer future management decisions.

Since 1997, when the District first implemented and enforced public use regulations for the southern terminus of Reedy Creek, bald eagle territories were subject to direct and indirect protective measures. For example, although the parameters of the District's 1997-1999 Public Use Rule (SFWMD 1999a) was specific only for protection of the wood stork and Southeastern big-eared bat colonies, the established rules also provided protection from human intrusion for the nearby eagle nests. TNC's Disney Wilderness Preserve management

actions are specifically designed to protect bald eagle nests during prescribed burns, including removal of potential fuel from around the nest trees and using methods to keep the burning at a low intensity (Dossman 1992). Concern has been raised about protection of feeding and roosting sites for bald eagles during the non-nesting season. (See Section 6.2 for inventory, monitoring, and research programs related to wildlife.)

A summary of management zone recommendations for bald eagles is given in Table 8. Appendix M lists pertinent statutes, laws, and recommendations for bald eagle management.

Table 8: Summary of Management Zone Recommendations for Bald Eagles
(Taken from U.S. Fish and Wildlife Service 1987.)

SITE TYPE	ZONE TYPE	DISTANCE	PARAMETERS OF SITE	ACTIVITIES RESTRICTED YEAR ROUND	ACTIVITIES RESTRICTED WHILE ACTIVE
Nesting Territories	Primary Zone	Within 500 ft – vertical Within 1000 ft – horizontal			- Aircraft operation
		750 – 1500 ft In all directions from site	Proximal and spatial configuration of nest trees, feeding area, and roost trees determine distance.	- Residential, commercial, or industrial development - Tree cutting & logging - Construction - Mining - Use of toxic chemicals	- Human entrance
	Secondary Zone	750 ft – 1 mi from Primary In all directions from site beyond the Primary Zone	Site-specific circumstances to provide protected access to and from feeding and nesting sites.	- New commercial or industrial site development - Construction of multi-story and high-density buildings between feeding and nesting sites - Construction of new roads, trails, and canals - Use of toxic chemicals (including herbicides and pesticides)	- Logging - Land clearing - Construction - Seismographic activities employing explosives - Mining - Oil well drilling - Low-level aircraft operations
Roosting Sites - adjacent to nesting territories	Primary Zone	750 – 1500 ft In all directions from site	Proximal and spatial configuration of nest trees, feeding area, and roost trees determine distance.	- Removal of living or dead trees	
	Secondary Zone	750 ft – 1 mi from Primary In all directions from site beyond the Primary Zone	Site-specific circumstances to provide protected access to and from feeding and nesting sites.	- Removal of large, living or dead, roosting and perch trees	
Communal Roosting Sites		1500 ft		- Logging - Land clearing - Disruptive human activity	
Feeding Sites		In watershed or rivers		- Toxic chemical use - Shoreline alteration	

Management Objective

- Protect nesting, roosting, and foraging bald eagles located within the LRCMA.

Management Actions

- Implement management practices that are beneficial for bald eagles.
- Propose management practices that are beneficial for bald eagles.

- Avoid implementing management practices that adversely affect bald eagles.
- Propose management strategies that avoid adversely affecting bald eagles.
- Ensure nesting site primary and secondary zone activities are restricted as per the Habitat Management Guidelines.
- Coordinate and/or contract the identification of bald eagle roosting and feeding sites and seasonal usage patterns within the Rough Island and Johnson Island Management Units
- Ensure bald eagle roosting and feeding site activities are restricted as per the Habitat Management Guidelines.

Southeastern Big-eared Bats

A colony of southeastern big-eared bats was discovered in an abandoned trailer on District property in September 1993. It is possible the bats had been roosting undetected at the site for up to 15 years (Finn 1996). It is the southernmost maternity colony of Corynorhinus species yet confirmed.

Little data has been collected where the southeastern big-eared bat is considered a rare species. Females give birth to one pup in May or June, and the young are ready to fly within three weeks (Belwood 1992). The big-eared bat is found in mature hardwood hammocks, and may roost within tree hollows, crevices between bark, and empty buildings (Finn 1996). Roosting big-eared bats have been shown to be faithful to previously used sites and highly susceptible to disturbance, possibly causing abandonment (Clark & DeTour 1995). A traditional roost site in North Carolina was abandoned when the only known human activity in the area was researchers studying the site (Clark 1990).

The southeastern big-eared bat is listed federally as Under Review 2, and is considered rare by the FCREPA (Humphrey 1992). Before the category was dropped in 1995, Corynorhinus was listed as a C2 species by the USFWS, meaning that it was recognized as a candidate for listing (Richardson et al. 1996). The Southeastern Bat Diversity Network is currently seeking to have the big-eared bat listed as a Species of Special Concern (W. Kern, pers. comm. July 12, 1999).

There will not be an attempt within this document to recount the complete life history, biology, or habitat needs of southeastern big-eared bats. Research is still being conducted on southeastern big-eared bats and no determination has been made for listing the species. No federal or State protection exists for Corynorhinus at this time. As such, private ownership of land where the bats roost is one of the best means of protection from public recreational disturbances.

An abandoned trailer (used as a colony site) is located within a fairly remote hardwood hammock in the Rough Island-West Management Unit. The tract is managed by TNC under contract and is therefore protected from human intrusion. In 1996, LSD staff built a “bat house” near the north perimeter of the management unit, adjacent to the existing abandoned trailer. The bat house was built in an attempt to relocate the bats to the new house, leaving

the abandoned trailer to be removed from the site. The site has been monitored from 1996 through 2000 for presence of bats. As of August 2000, there had been occasional use of the bat house by southeastern big-eared bats, but the majority of the bats continued to use the abandoned trailer as their colony site.

Seven alternate roosts were found in cypress trees, ranging in distance from the creek from 3.6 to 182 meters; three of these trees were night roosts, used for foraging and feeding, and four were day roosts, used for resting and socializing (Finn 1999b). In an effort to protect the foraging and roosting sites of the bats, the District's 1997-1999 Public Use Rule restricted public use activities in a protected zone of the creek from 9 p.m. to 6 a.m., minimizing disturbance in the creek corridor (SFWMD 1999b). FWC and private scientists (studying the colony) have suggested maintaining the nighttime public use restrictions until results of radio-telemetry research can be analyzed. A portion of the research attempted to track bat foraging and roosting habits as they related to airboat traffic within the creek corridor. Results of the research will aid future public use rule development, management activities, and research.

Management Objective

- Protect nesting, roosting, and foraging Southeastern big-eared bats located within the LRCMA.

Management Actions

- Implement management practices that are beneficial for Southeastern big-eared bats.
- Propose management practices that are beneficial for Southeastern big-eared bats.
- Maintain nighttime public use restrictions until such time that research indicates such activities do not negatively alter southeastern big-eared bat foraging patterns.

Reintroductions

Over the next several years, TNC will direct a reintroduction effort in the Reedy Creek area of the red-cockaded woodpecker, a federally endangered species (M. Folk, pers. comm., August 4, 1999). Similarly, the USFWS has successfully reintroduced 24 whooping cranes (Grus americana*)* into Florida; the goal for 2020 is to have at least 25 breeding pairs in the state (Nesbitt 1996). Scientists discovered three whooping cranes landed for one day on nearby Johnson Island (M. Folk, pers. comm., August 4, 1999). Two birds were also seen on Rough Island in March 1998. Both reintroduction efforts should be monitored by LSP staff to determine if the LRCMA is being used as habitat by either species.

Management Objective

- Maintain reintroduction techniques as a future option to re-establish native species within the LRCMA where human activities have resulted in the local extirpation of that species.

Management Actions

- Assist TNC, USFWS, and the FWC with wildlife reintroduction efforts when such efforts directly involve lands owned by the District within the LRCMA.
- Evaluate potential reintroduction programs to assure consistency with District goals, policies, and objectives.
- There are no current LSP-reintroduction activities planned for the LRCMA.

6.3.8.2 Game Management

The following hunting policy applies to all Land Stewardship-managed lands.

Policy 05.00114.2d - Hunting, in areas opened for such use, is governed by the Florida Fish and Wildlife Conservation Commission regulations.

Game density is believed to be relatively high due to the wide array of natural communities within the Reedy Creek and Kissimmee basins. In 1999 and 2000, District staff discussed scenarios with FWC under which they would manage portions of the LRCMA (specifically Rough and Johnson Islands) included in a Type 1 - Wildlife Management Area (WMA). This program would potentially include all District-managed properties adjoining the Kissimmee Chain of Lakes. FWC staff has expressed interest in the proposal, but did not foresee immediate implementation due to staffing shortages. District staff must outline a formal proposal and forward it to the Commission to proceed with the negotiations.

Until a decision is made on the pending WMA contract with FWC, game management, regulation of hunting activities, and enforcement of hunting laws within areas opened for hunting are conducted under statewide laws and regulations. Areas that are opened to hunting under statewide law are District owned and/or managed lands outside of the posted blue District boundary signs (which must also be outside of posted No Trespassing areas).

Areas outside of the posted blue District boundary signs opened for statewide hunting activities included:

- The marshes south of Rough Island-North and surrounding Rough Island-South;
- The McKinney tract on Rough Island-West; and
- The lakeward marshes along the south, eastern and western edge of Johnson Island.

* Under FWC statewide regulations:

- Resident game birds are quail (Colinus virginianus) and wild turkeys.
- Resident game mammals are deer, gray squirrels (Sciurus caroliana), and rabbits (Sylvilagus sp.).
- Migratory game birds are ducks (Anas sp.), common moorhens (Gallinula choloropus), coots (Fulica americana), snipes (Gallinago gallinago), and mourning doves (Zenaida macroura).
- While wild hogs are not considered game mammals, they are a huntable species within certain areas.

- All native species of birds, in addition to game birds, are protected by state and federal laws. Except as described in FWC rules, no native bird may be taken or molested.
- Unprotected birds (considered exotic species) include the English sparrow, European starling, rock dove (pigeon), and muscovy duck, although as of November 2001, these species have not been documented.
- Unprotected mammals known to inhabit the Area include the armadillo and coyote.

All persons wishing to hunt on District-owned and/or managed lands within the LRCMA should first consult with regional District land managers, FWC wildlife officers, current District Public Use Guide, and current FWC hunting pamphlets to ensure compliance with regulations.

The TNC-managed Universal and Park Equus tracts are closed to hunting. The Lake Russell Unit is closed to hunting as it is managed cooperatively with the Osceola County School Board as an environmental educational facility. (Before participating in any type of public use activity on District owned and/or managed lands, consult with the regional land manager or the current Public Use Guide for Land Management Areas concerning area regulations.)

Management Objective
- Protect and perpetuate game species within the LRCMA.

Management Actions
- Consult and coordinate with the FWC concerning game management programs.
- Submit to the FWC a proposal for the establishment of a cooperative WMA program (or some other program) for portions of the LRCMA.

6.3.8.3 Wildlife Pest Management

Pest management targets species that negatively impact the function of native ecosystems, native species diversity or abundance. In most cases they are non-native, having been introduced from foreign locations as the result of released pets, cargo stowaways, introduced game animals, or as in the case of feral hogs, naturalized from the time of early Florida exploration. Exotics compete with native species for limited resources due to their high reproductive rate and lack of ecological control factors, such as predation and disease. In some cases, exotic species inadvertently damage natural communities they frequent, or spread disease to endemic populations.

The LSP strives to reduce non-native wildlife populations to appropriate numbers that result in an acceptable level of impact to natural communities. There are non-native species within the Management Area, however not every non-native animal fits the criteria of pest species. Pest species management objectives must consider the impact of each species and the practicality of population control measures.

6.3.8.3.1 Species Selection Criteria

At least one of the following criteria must be met to designate a wildlife species as a pest that requires population control. The species is non-native to the North American continent and:

- *predates heavily on listed species*
- *introduces disease to native populations;*
- *introduces invasive non-native plant species;*
- *is in direct competition with native species for resources;*
- *inhibits reaching management goals and objectives by interfering with land management operations.*

6.3.8.3.2 Pest Population Control

However desirable, total eradication of a pest species is often an unattainable goal. Trapping, baiting or shooting seldom removes all individuals, and animals travel from adjacent properties searching for food or mates, fleeing hunting pressure, or establishing new home ranges. The goal of the LSP's pest management program is reduction in the pest population to obtain an acceptable level of impact to natural communities and endemic wildlife populations. The land manager, with possible FWC recommendations, will define and determine the acceptable level of impact during periodic site inspections. When determining the "acceptable level of impact," the land manager considers acreage affected, species influenced, and management operations affected.

Management Objective

- Reduce non-native pest species populations and their associated impacts in the LRCMA.

Management Actions

- Utilize the selection criteria for those species under consideration for population control.
- Coordinate with FWC for species information, harvest laws, and population control measures.
- Employ control measures that are consistent with state law, cognizant of public safety and appropriately humane.
- Monitor pest species impact by periodic site visits.

6.3.8.3.3 Lower Reedy Creek Management Area Pest Species

The feral pig is the predominant pest species in the Management Area. *It meets the species selection criteria as an introduced species that interferes with land management operations and is in direct competition with native species for resources. Feeding habits, high fecundity, and habitat adaptability provide an intolerable combination of pressures on most natural communities subject to feral hog populations. Hog disturbance has occurred in most wetland community types and hammocks within the area. Rooting and feeding on underground vegetation poses numerous problems, especially to biologically sensitive areas slow to recover from disturbance. Areas with high populations of hogs frequently have the ground layer vegetation denuded in certain areas, inhibiting prescribed burn efforts. Rooted*

areas in wetlands are susceptible to exotic plant establishment and are set back to earlier successional stages.

Feral pigs are found throughout the management area, but populations are largest and most destructive in the Rough Island-North and Johnson Island Units. Control measures in these areas include public hunting under statewide regulations in those areas open to hunting. A trapping program—coordinated by the U.S. Department of Agriculture and the Florida Department of Agriculture—was also used in the Johnson Island Unit in 1998 and 1999 with limited success. A long-term solution to the feral hog problem at the Johnson Island and Rough Island Units is needed, as it is in many areas throughout the State of Florida.

Management Objective

- Minimize ecological impacts associated with feral pigs located within the LRCMA.

Management Actions

- Work with biologists from the FWC, Florida Department of Agriculture, and U.S. Department of Agriculture to determine the best approach to control feral pigs in the LRCMA.
- Develop and implement an effective feral pig control program for the LRCMA.

6.4 Human-Related Activities

The following natural resource and recreation policy applies to all Land Stewardship-managed lands.

Policy 05.00110 - The Land Stewardship Program's mission is to provide natural resource protection and management while allowing appropriate recreational use on designated public lands.

Responsible management of District lands involves a commitment to resource protection in conjunction with facilitating compatible public use. Section 373.1391 (1)(a), F.S.S., states wherever practical, lands acquired by the District's SOR Program shall be open to the general public for recreational uses. Potential compatible uses are outlined in Section 373.1391(1)(b), F.S.S. The delicate balance of public use and resource protection is insured by the resource protection program, public use regulations, and a public use program. These programs are designed to enlighten outdoor enthusiasts to recreational opportunities afforded on District lands. The resource protection program integrates contractual law enforcement, on-site caretakers, lessees' vigilance, and employer inspections to protect the natural resources and District assets. Public access and compatible use is encouraged by planning and providing for the development of outdoor recreational facilities focused on access, health and safety, and interpretation.

6.4.1 Resource Protection

The following resource protection policies apply to all Land Stewardship-managed lands.

Policy 05.00113.7 - Security and resource protection shall be provided by professional law enforcement services through contractual and non-contractual agreements, to safeguard the public and protect natural and cultural resources on District-managed natural areas.

Policy 05.00114.2b - Rules and regulations governing the public use of each management area shall be enforced by agencies with appropriate law enforcement jurisdiction.

Policy 05.00114.2c - Pursuant to Section 373.609, F.S.S., it shall be the duty of every state and county attorney, sheriff, police officer, and the appropriate city and county official to assist the District, and their agents, in the enforcement of the provisions set forth according to 40E-7.511 F.A.C.

Law enforcement patrols in the LRCMA are required to deter criminal activity, safeguard the public, and protect natural and cultural resources. The long irregular boundary of the project provides numerous opportunities for poaching and the lack of vehicular access to some portions makes law enforcement patrol difficult.

The District does not directly employ state certified law enforcement personnel to patrol Land Stewardship-managed lands. Consequently, the District uses several alternative methods to establish a law enforcement presence on its properties. These alternatives consist of:

- *Contracting with law enforcement agencies;*
- *Working with county and municipal law enforcement agencies to explain the LSP and gain in-kind law enforcement services;*
- *Establishing on-site law enforcement officers who live in District-owned residences and provide a visible presence on the property;*
- *Utilizing cooperative land management agreements with agencies that possess law enforcement authority; and*
- *Establishing contracts for cattle grazing in which ranchers oversee activities on Land Stewardship properties.*

6.4.1.1 Patrolling

The LRCMA lends itself to contractual and in-kind law enforcement patrols, and grazing lessee oversight. Major problems in the area include illegal entry (foot and airboat), poaching, dumping, trespassing on adjacent properties, and gate/fence/sign destruction. The LSP Resource Protection Coordinator oversees the contract (C-10162) with FWC for scheduled patrolling of District properties. There are approximately 50 law enforcement (wildlife) officers available for patrolling throughout the District. Patrols in the Management Area may be conducted in 4x4 vehicles, boats, airboats, all-terrain vehicles, or on foot. The current contract expiration date is March 2024. Patrol times, locations, and type may be changed to address enforcement needs as they arise.

Contractual law enforcement patrols are performed by FWC. In-kind law enforcement patrols, patrols performed as part of the officers' normal patrol routines, are also conducted by officers of FWC and the Osceola and Polk County Sheriff's Offices. Regional offices for dispatching Wildlife Officers are located in the Commission's Lakeland Office (for Polk County: Rough Island-North and West, Johnson Island) and Ocala Office (Osceola County: Lake Russell, Merritt Island, Rough Island-South). Contact information for the Commission and the Osceola and Polk County Sheriff's Offices is located in Appendix A.

The Osceola and Polk County Sheriff's Offices are the primary local law enforcement agencies covering the Management Area. Meetings with Sheriff's Office representatives have been made, but follow-ups will be necessary to them keep them updated on District rules and programs.

Management Objective

- Safeguard the public, natural resources, and cultural resources located within the LRCMA.

- Management Actions
- Coordinate enhanced law enforcement patrols by FWC Wildlife Officers (under contract C-10162).
- Schedule meetings and site visits with Commission and county sheriff patrol supervisors and agricultural officers to maintain communications and to discuss problems concerning the management area.
- Ensure that special patrol efforts concentrate on sensitive natural resources such as avian rookeries during the breeding season, significant cultural/historical sites, and listed plant and animal species.
- Review law enforcement reports and respond to problems or requests for management assistance in a timely manner.

6.4.1.2 Delineation, Fencing, Posting

Perimeter delineation of SOR property boundaries is accomplished by posting, mowing, and fencing. In some cases, fencing does not occur until all parcels of an acquisition project are under ownership. In the interim period, posting, minimal fencing, and gating occurs as needed. Fencing projects of one half mile or less may be performed by the Land Stewardship Field Crew and land managers, while longer fencing projects are contracted to the private sector. Standard fencing specifications are on file at the District's Orlando Service Center.

The LRCMA has approximately 29 miles of perimeter boundaries. This includes areas that abut private land, public waterways, and public road rights of way. Some units also have interior fence lines that facilitate cattle grazing. All exterior boundaries are posted. However, reposting of boundaries must be done at least semi-annually (once immediately prior to the hunting season in August or September). Many of the perimeter boundaries are fenced; however, some areas need major repairs, new fence, or minor repairs, and all need perpetual annual maintenance. In perimeter boundary areas that abut public waterways and private

lands, where vegetation may obscure posting or fences, the District also mows the boundary one to two times per year. Table 9 summarizes the boundary posting and fencing needs for the Management Area.

Table 9: Boundary Delineations for the Lower Reedy Creek Management Area

MANAGEMENT UNIT	LAND BOUNDARY * (in miles)					WATER BOUNDARY * (in miles)					REMARKS
	Posted	Mowed	Fenced	Requires New Fencing	TOTAL	Posted	Mowed	Fenced	Requires New Fencing	TOTAL	
Lake Russell	2	.5	2	1	2	1	0	0	0	1	Requires new fencing along east side; to be done by District contract.
Merritt Isl.	0	0	1	0	1	1	0	0	0	1	Park Equus is managed by TNC
Rough Island-North	2.75	2.75	2.75	0	2.75	1.5	1.5	.25	1.25	1.5	Semi-annual fencing, posting, and mowing to be completed by District staff.
Rough Island-South	1.5	1.5	1.5	0	1.5	6	6	0	0	6	Semi-annual fencing, posting, and mowing to be completed by District staff.
Rough Island-West	1.75	0	3	0	3	.75	0	0	0	2.5	Managed by TNC and GOAA/PBS&J.
Johnson Island	3.5	3.5	3.5	1	3.5	3.5	3.5	0	0	3.5	Semi-annual fencing, posting, and mowing to be completed by District staff. Requires new fencing on north and west side; to be completed by new grazing lessee.
TOTAL	11.5	8.25	12	3.25	13.75	13.75	11	0.25	1.25	15.5	

* All boundary distances are approximations.

Management Objective

- Delineate boundaries of the LRCMA.

Management Actions

- Coordinate new fence construction (or major repair work) on the east side of Lake Russell, the northwest side of Johnson Island, and the north side of Rough Island-North.
- Conduct semi-annual fence inspections and make repairs as necessary.
- Conduct semi-annual posting inspections and repost as necessary.
- Mow all land and water boundaries where fencing and/or posting may be obscured by vegetation on a semiannual basis.

6.4.2 Public Use

The following public use policies apply to all Land Stewardship-managed lands.

Policy 05.00111.4 - Public use shall not result in detrimental impacts to water resources. When a public use activity produces detrimental effects on water resources, it shall be discontinued until an evaluation determines that such use is compatible.

Policy 05.00114.1 - Public use of management areas shall be encouraged that is consistent with other management goals. Public use that may have detrimental impacts on sensitive environmental resources shall be restricted until an evaluation determines such use is compatible. A public use compatibility assessment will be included in the General Management Plan completed for each management area and will be based on the following criteria:

h) Consistency with the reason the lands were acquired;
i) Restrictions and/or prohibitions imposed by easements, leases, reservations, adjacent land ownership, and other conditions of the purchase agreement;
j) Infrastructure and support facility requirements, such as fences, gates, signage, entry design, stabilized off-road parking, trails, campsites, maintenance, and other operational and budgetary impacts;
k) Opportunities for persons with disabilities;
l) Limitations resulting from endangered/threatened/rare species, other sensitive natural resources, archaeological resources, or land management practices;
m) Public health, safety and welfare; and
n) Environmental education program opportunities.

Public use activities that are appropriate for the LRCMA include, but are not limited to, fishing, hunting, horseback riding, swimming, camping, hiking, canoeing, boating, birding, environmental education, and nature appreciation. Other related outdoor purposes shall be encouraged when such use does not interfere with protection and management of the natural resources. Special consideration will be given to the provision of outdoor recreational opportunities for persons who are physically challenged. The appropriateness of public use activities may change with time and/or for any given area based on the criteria outlined above.

6.4.2.1 Public Use Regulation

The following public use policy applies to all Land Stewardship-managed lands.

Policy 05.00114.2a - Public use regulations are set forth in 40E-7.511 F.A.C. to implement Sections 259.101, 373.016(2)(h), and 373.1391(1)(b), F.S.S. Accordingly, the District publishes and makes available to the public a "Public Use Guide" for designated land management areas. The Public Use Guide will be considered by the Governing Board at a public meeting advertised in accordance with Chapter 120, F.S.S.

The District's public use rule is revised on a biannual basis, a timeframe that began in 1998. The rule is generally opened for revision by Governing Board action in the spring. Public meetings are held throughout the District to solicit comments and to present proposed changes. The proposed rule is presented to the Governing Board for adoption during the summer, to be implemented in the fall. The target month for implementation is September. However, if there are objections or negotiations concerning the rule proposal, the entire rule revision timeframe

can be delayed. (Each rule revision year, specific deadline dates are generated for each step before initiation of the revision process.)

Regulations governing the public use of management areas shall be enforced by law enforcement agencies with the appropriate jurisdiction. Pursuant to Section 373.609, F.S.S.:

. . . it shall be the duty of every state and county attorney, sheriff, police officer, and the appropriate city and county official to assist the District, and their agents, in the enforcement of the provisions set forth according to 40E-7.511 (Public Use Guide/Regulations).

The public use rule for the LRCMA has been a topic of local controversy since 1996, the year it was first implemented. Rules for public activities in the Lake Russell and Johnson Island Units have been generally well received. The rule for the Rough Island Unit—an area that serves as a navigational access point for public waterways beyond the District's boundaries—has been the source of debate. Issues surrounding the rule involve the protection of rare and listed wildlife species, the protection of private property rights, the protection of the creek ecosystem, and conflicts between user groups. Management guidelines for protection of specific wildlife species are detailed in Section 5.3.8 and Appendices N & O.

Given the short period of implementation, it is difficult to draw scientific conclusions on the adequacy of the 1997-2001 public use rule for the LRCMA. Public use within a protected zone of the lower creek corridor (within District ownership and/or management) was permitted only from August 16th – February 14th, 6 AM – 9 PM, when in the possession of a Special Use License. At all other times, public access is prohibited. This rule was developed in an attempt to protect the wood stork and southeastern big-eared bat colonies that are located within the creek corridor. However, critics claimed the rule was minimally restrictive while others claimed it was too restrictive. On the extreme, some constituents wanted airboating and hunting prohibited during all times of the year and other constituents wanted unrestricted airboating and hunting allowed during all times of the year.

The timing of public uses within the lower Reedy Creek corridor is a critical issue for many persons and organizations interested in the watershed. Recreational users have requested a less stringent rule with expanded hours to allow usage in morning hours, as well as removal of the seasonal restrictions. Other environmental and natural resource groups, such as TNC and The Audubon Society, have requested the opposite, encouraging the District to adopt more stringent rules.

Although no specific demands have been made, the Florida Fish & Wildlife Conservation Commission has recommended that bald eagles and wading birds be considered by the District when the Reedy Creek Public Use Rules are revised. Many of the problems created by the public use of the Creek may be linked to the species' disturbance caused by noise pollution. The District's 2001 – 2002 public use rule had no speed or noise restrictions. The District could adopt rules to reduce the speed and noise of passing boats – for example,

mufflers could be required on airboats and boats could be limited to idle speeds. However, ensuring the effectiveness of this rule could require the District or other natural resource agencies, such as FWC, to assign enforcement officers to the region. Ultimately, speed and noise restrictions could still prove to be insufficient as pedestrian traffic has also been recognized as a significant cause of species disturbance, and a rule addressing noise and speed would not deter pedestrian impacts.

Another option was to find alternative routes for recreational users of Reedy Creek. A by-pass around the protected area was proposed, allowing airboaters to navigate around the cypress on submerged sovereign land below the 52.5 foot contour line. A buffer zone around the wood stork colony would act as the periphery for the by-pass, and minimum set-back distances would be adhered to. However, the option assumed that the protected area would remain at the same location from year to year, and does not take into account the possible mobility of the traditional stork colony. Also, if water levels are low, the by-pass route would be difficult to traverse in a watercraft.

The issues the District needs to address in the Lower Reedy Creek-Rough Island rule are complicated and numerous. A summary follows.

- A Wood stork colony requires protection from disturbance caused by human activities during the nesting season (February 15 – August 15);
- Wood storks require protection from disturbance caused by human activities in feeding and roosting areas throughout the year;
- Nesting bald eagles require protection from disturbance caused by human activities from October 1 – May 15;
- Southeastern big-eared bats likely require protection from disturbance caused by human activities during nighttime hours throughout the year;
- Several additional rare, listed, and/or sensitive wildlife species that inhabit the creek corridor would likely benefit from the solitude of restricted public use;
- Reedy creek is a narrow, meandering creek that has high variations in water levels and numerous logs and other obstructions in the main corridor. Navigation in the creek is difficult at times which increases the likelihood that hydrologic and/or ecologic-altering channel clearing will occur.
- Local landowners complain of trespassing, fence cutting, and poaching associated with public users on District property;
- Local landowners and non-airboating public users desire an environment free of noise pollution caused by airboats;
- The District agreed during acquisition negotiations to prohibit motorized vessel operation above the ordinary high water line on Rough Island-North;
- Cattle operations on Rough Island-North and South require a fence between the Units to keep cattle separate;
- District-managed property at the southern terminus of Reedy Creek serves as the sole public access point for the public. Non-District-managed waters (including Lake

Russell) are located to the north. As such, regulations that restrict public use on District property, by default, restrict public use on non-District managed public property;

- Hunters and airboaters desire historically claimed and used access to sovereign lands located at the southern terminus of Reedy Creek, within the Rough Island Management Unit.

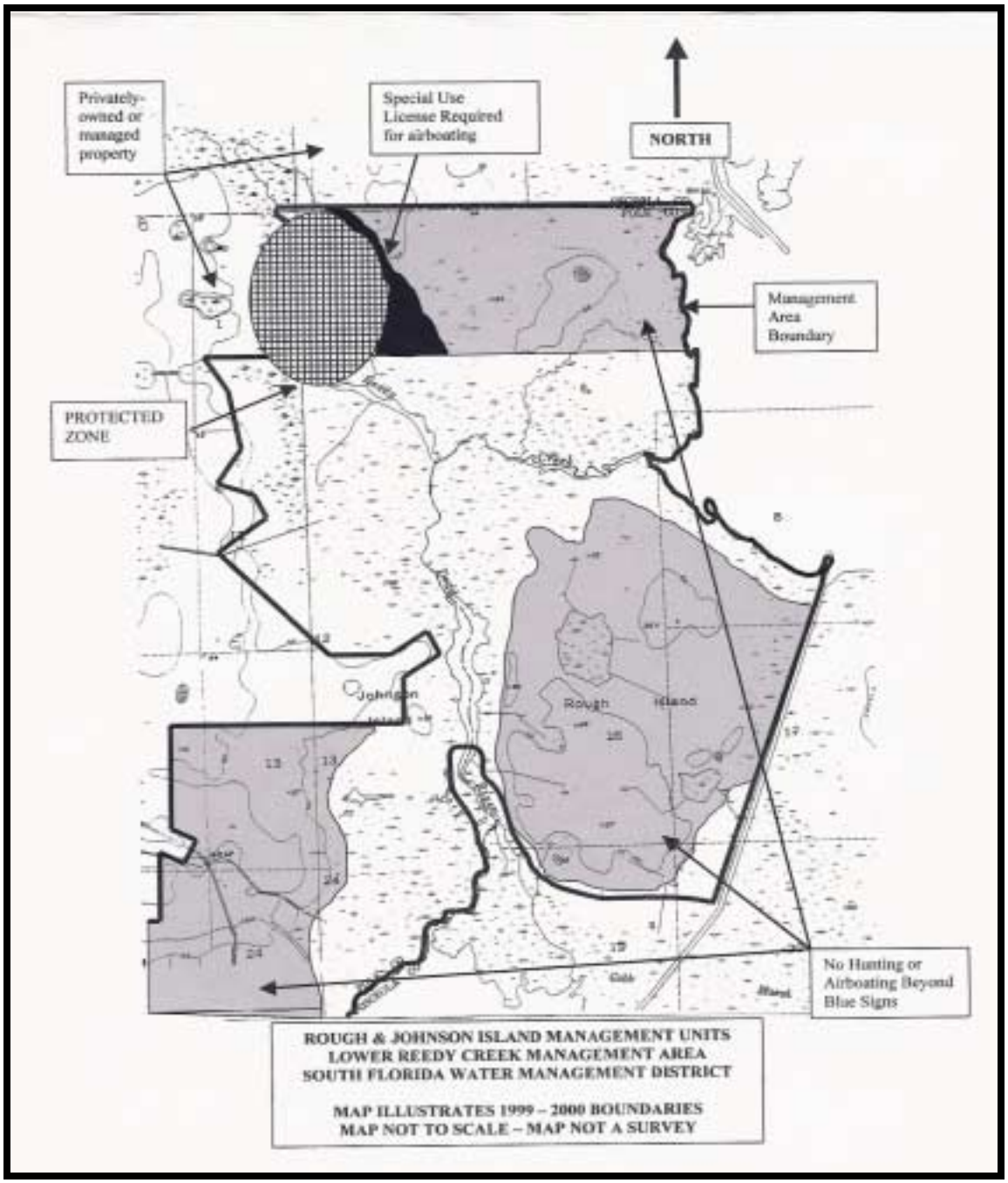
During the 2000 rule revision process, the District proposed prohibiting all public use within the forested creek corridor (within the Rough Island Unit), 365 days per year, 24 hours per day. An alternative bypass route, outside of the forested corridor but within the ordinary high water line, would be used instead. This proposal was reviewed by the FWC and the USFWS. The FWC approved the proposal contingent upon approval by the USFWS. The USFWS rejected the proposal, determining it did not conform to management guidelines (as detailed in Section 5.3.8.1) for Wood storks or bald eagles. The District alternatively proposed the same rule with the addition of an annual closed period, coinciding with the Wood stork nesting period, for the bypass (Map 15).

Management Objective

- Safeguard the public, natural and cultural resources located within the LRCMA.

Management Actions

- Evaluate the effectiveness of the 2000-2002 Public Use Rule for the LRCMA during a two-year implementation period.
- Consider modifications to the 2000-2002 Public Use Rule for the LRCMA during the biannual rule revision process in 2002 and 2004.
- Adhere to Habitat Management Guidelines for listed species when proposing rule modifications for the LRCMA.



Map 14: 2000 - Public Use Proposal for the Lower Reedy Creek Management Area

6.4.2.2 Public Use Programs

A preliminary determination of allowable recreational activities will be set forth in the GMP for each management area (Table 10 summarizes current recreational opportunities in the LRCMA). Carrying capacity, intensity of use, and required support facilities and services will be detailed in the activity plan, if available. Future changes that may be necessary based on operational experience will be included in annual work plans and five-year updates to GMPs (and activity plans, if available).

The public use assessment for each management area will include an evaluation of the following issues:

- *Consistency with the environmental sensitivity of these areas and the purposes for which lands were acquired.*
- *Restrictions and/or prohibitions, if any, imposed by easements, leases, reservations and other conditions of the acquisition.*
- *Roads: availability of access and circulation roads or other suitable points of entry; need for improvements.*
- *Consideration of adjacent public lands for possible integrated use.*
- *Consideration of adjacent private lands for issues involving safety and other private ownership rights.*
- *Need for support facilities and services such as fences, gates, signage, entrance design, stabilized off-road parking, trails, campsites, ongoing maintenance, security, and other operational and budgetary impacts*
- *Feasibility of developing public use opportunities for persons who are physically challenged.*
- *Limitations imposed by other planned management practices such as fire, hydrology, forestry, vegetation, agriculture, archeological and historical resources, range, soil and mineral, and wildlife management.*

In addition to annual reviews of the public use programs, District staff has presented a conceptual proposal to TNC under which the District could provide low-impact, passive, non-consumptive public use opportunities to TNC-owned land adjacent to the Lake Russell Management Unit. TNC owns approximately ten acres of land that lie between District-owned property along the shore of Lake Russell. The TNC property is ideal for primitive camping and canoe launching activities associated with the Osceola County School District's environmental education program at the Lake Russell Management Unit. District staff must submit a formal proposal to TNC to proceed with contract negotiations.

Management Objectives

- The District will develop a public use plan by 2004
- Provide opportunities for environmentally compatible public use in the LRCMA.
- The public use program in the LRCMA shall be low impact – non-destructive to environmental characteristics of the area.

- The public use program in the LRCMA shall be passive in nature – not requiring significant facility or infrastructure development (excluding the Lake Russell Environmental Center).

Management Actions

- Provide public access to the LRCMA as specified in the District's current biannual publication - Public Use Guide to Land Management Areas.
- Track and report quarterly levels of public use activities in the LRCMA in quarterly reports.
- Develop and submit a formal proposal to TNC for the public use at TNC's 10-acre parcel adjacent to the Lake Russell Management Unit.
- Maintain access points and information boards/kiosks (with public use pamphlets and regulations) at the Rough Island and Johnson Island Units.

Table 10: 1999-2000 Recreational Opportunities* Lower Reedy Creek Management Area

Management Unit	Fishing	Hunting	Hiking	Equestrian	Biking	Canoeing	Boating	Camping	Airboating	Frogging	Nature Study
Lake Russell			X					S			X
Merritt Island (Park Equus)											
Rough Island-North	X	X	X	S		X	X	X	X	X	X
Rough Island-South	X	X	X	S		X	X	X	X	X	X
Rough Island-West (Universal)											
Rough Island-West (McKinney tract)	X	X	X					X	X	X	X
Johnson Island	X	X	X			X	X	X	X	X	X

* Before participating in any type of public use activity on District owned and/or managed lands, consult with the regional land manager or the current *Public Use Guide for Land Management Areas* concerning area regulations.
"X" indicates an activity that is regulated by statewide laws and regulations and District rule.
"S" indicates an activity that has additional special restrictions placed upon it.

6.4.2.3 Revenue Generation

The following fee/permit/license policy applies to all Land Stewardship-managed lands.

Policy 05.00115.33b - Entrance and user fees, permits, licenses and/or advance reservations may be required for use of District lands where considered necessary by the managing agency.

Entrance and user fees, permits, licenses and/or advance reservations may be required for entry onto and use of District lands where considered necessary by the managing agency to supplement operating expenses and/or to properly regulate public use. District 1997-1999 regulations required a cost-free Special Use License to camp at the Lake Russell Unit and to enter a restricted area north of the Reedy Creek-Dead River divergence. Under special approval/waiver of the District's regulations by the Governing Board, horseback riding could be authorized at the Rough Island Unit when in the possession of a Special Use License.

Management Objective
- Control types and levels of public use activities in the LRCMA by the issuance of Special Use Licenses.

Management Actions
- There are no current or planned entrance fees required to access the LRCMA.
- The District may exercise the option to charge user fees following a public use assessment of the property.
- Issue Special Use Licenses for recreational activities in the LRCMA as specified in the District's current biannual publication - Public Use Guide for Land Management Areas, or as approved by the District Governing Board.

6.4.2.3.1 Private Concessions

The following concessions policy applies to all Land Stewardship-managed lands.

Policy 05.00115.3a - Private concessions and/or agreements with non-profit organizations will be considered to implement needed services through concession contracts.

Where appropriate, consideration will be given to the provision of needed facilities and services through concession contracts and/or agreements with private non-profit organizations.

Management Objective
- Provide environmentally compatible opportunities for private concessions within the LRCMA.

Management Actions
- As of July 2000, there were no current or planned concessions within the LRCMA.
- Evaluate proposed concession services and/or facilities on a case-by-case basis.

6.4.3 Infrastructure Management

The following infrastructure policy applies to all Land Stewardship-managed lands.

Policy 05.00113.11 - Infrastructure support shall be developed and maintained to provide safe access for responsible management and public use on District lands. Such infrastructure includes access points, roads, trails, utilities, and minimal public facilities.

Pedestrian Access

Pedestrian access to District lands for public recreational purposes will be allowed, upon completion, establishment, or implementation of:

- *An ecological survey or inventory;*
- *A recreation assessment;*
- *A risk assessment;*
- *A boundary survey and required posting;*
- *Designation of authorized point(s) of entry;*
- *Security measures; and*
- *Governing Board approval.*

Pedestrian access for public recreation was authorized at the Lake Russell, Rough Island, and Johnson Island Management Units (under regulations specified in the District's current Public Use Guide to Land Management Areas). Other than a short, interpretive trail (developed and maintained by the Osceola County School Board) at the Lake Russell Unit, no specific pedestrian access facilities (i.e. hiking trails) existed or were planned for the management area. Pedestrians may walk or hike throughout areas opened for such use.

Motorized Access

Motorized access to the management area, by vehicles and vessels, is allowed at authorized locations only. Public vehicular travel is authorized only at the Lake Russell Unit on the gravel road up to the paved parking area, for access to the Osceola County Environmental Education Facility. No public vehicular traffic (automobiles, trucks, swamp buggies, ATVs, 4x4s) is allowed at any other location within the management area. Public motorized vessel traffic is allowed in the Rough Island and Johnson Island Units outside of the posted blue District boundary signs (which must also be outside of posted No Trespassing areas). As of July 2000, areas outside of the posted blue District boundary signs opened for motorized vessel activities included:

- marshes south of Rough Island-North and surrounding Rough Island-South;
- McKinney tract on Rough Island-West; and
- lake ward marshes along the south and eastern edge of Johnson Island.

Cattle lessees, recreational users, canal right-of-way personnel, and contract personnel approached District land management staff with requests to improve the gravel road crossing at Reedy Creek in the Rough Island-South Management Unit. The road improvement would facilitate management, lessee, and Special Use License-authorized motorized vehicle traffic within the Management Unit in times of high water. Proposals to improve the road crossing included installing culverts, geo-web swale, a bridge, and/or simply raising the road surface. Issues of concern related to the road improvement include the possible restriction of navigation within Reedy Creek and the filling of wetlands. In 2000, the cattle lessee received District approval to improve the crossing, contingent upon the receipt of required permits from the FDEP. Due to low water levels that year, improvements to the crossing were not

needed and consequently not completed. As of July 2000, the District had no specific plans to improve the road crossing, but had not eliminated it as a future management option.

At the Lake Russell Management Unit, District staff has designed and approved a swamp enhancement project (as detailed in Section 6.1.4), to improve motorized vehicular traffic for management purposes only. Several additional culverts were placed under a portion of the roadway to stabilize the road surface.

Management Objective

- Provide pedestrian and improved management access to the LRCMA as specified by District public use rules.

Management Actions

- Maintain the access and parking area at the Lake Russell Unit.
- Maintain the pedestrian walk-thru in the fence separating Rough Island-North and South.
- Maintain signage to indicate locations of approved motorized vessel traffic in the Rough Island and Johnson Island Management Units.
- There are no current plans to develop formal hiking, biking, or horseback riding trails in the LRCMA.

6.4.4 Environmental Education, Community Extension, and Governmental Affairs

Educational programs may be developed for select management areas by cooperators interested in promoting increased visitor awareness of and appreciation for natural and cultural resources. The LSP encourages educational partnerships through memorandums of understanding, leases, and contract agreements.

The District entered into a cooperative agreement (Contract # C-7947) in 1996 with the Osceola County School Board for the development and management of environmental education and public use programs at the Lake Russell Unit through 2021. The contract authorizes the School Board to create and operate an educational facility on the management unit, in conjunction with the School Board's existing Reedy Creek Environmental Education Facility. The School Board subsequently submitted (and received approval for) a development and implementation plan to the District, which is filed at the District's Orlando Service Center. The School Board teaches environmental education programs to grade school, middle school, and high school students out of two mobile education classrooms. Two administrative buildings, a storage area, and an interpretive trail had also been established under the agreement. The public is allowed access to the facility and the Management Unit (during programs and/or weekends) when School Board staff is present. The School Board began development of an extended-day educational program that enables them to teach techniques to environmental trainers during two to three day programs (participants will stay overnight in four travel trailers).

Public outreach and government affairs programs for LSP in LRCMA are coordinated and implemented by two Government and Public Affairs Representatives based out of the Orlando

Service Center. The staff serves as the primary contacts for media relations, government representative communications, and classroom presentations.

Management Objective

- Provide environmental education, public outreach, and government liaison in association with the LRCMA.

Management Actions

- Coordinate and oversee the development and operation of the Lake Russell Environmental Education Facility with the Osceola County School Board.
- Coordinate with the District's Government and Public Affairs Representatives to develop and implement outreach and liaison activities.

7. Administration

LSP personnel administer the management of SOR natural areas from the SFWMD headquarters office in West Palm Beach. Policy decisions, acquisition procedures, contract administration and select issues of program development are coordinated from headquarters. LSP land managers located in District Regional and Service Centers (Orlando Service Center for the LRCMA), administer in-field land management and participate in administrative functions such as funding, planning, reporting and external entity coordination (see Appendix A for contact information).

7.1 Budgeting

The District's fiscal year runs from October 1 through September 30. LSP budget planning occurs on an annual basis starting in March of the previous fiscal year. Overall budget availability generally determines management activities. Budget distribution among the five land management regions is based on a prioritization of management activities within those regions. Operational funds are distributed to accomplish the management objectives of each management area.

Annual budgeting for the LRCMA is based on the management framework as presented in this GMP. Annual Work Plans (as discussed in Section 7.2.3) outline activities that require budgeted items.

The FY2001 budget proposal was submitted in April 2000 during the budget preparation cycle (Appendix J). While this budget serves as an Annual Work Plan, it does not include personnel costs.

Management Objective

- Provide annual operational and capital improvement budgets sufficient for staff, equipment, and supply resources necessary to attain a level of responsible management as outlined in LRCMA GMP.

Management Actions

- Develop and submit annual budget requests based on specific management needs for preservation, evaluation, applied management, human-use activities, and administration, for the LRCMA.
- Track budget expenditures on a monthly and annual basis to ensure efficient use of budget resources.
- Identify deficiencies in budget amounts and request appropriate additions to attain levels of responsible management as detailed in the GMP.

7.1.1 Funding

The following funding policy applies to all Land Stewardship-managed lands.

Policy 05.00115 - The District will secure dedicated funding sources, personnel, and other resources to support program goals and objectives. Project funding needs and sources for cooperative management agreements with government and non-government entities will be identified during acquisition. A cooperative management agreement will designate a lead manager and identify whether District funding is required.

The principle source of funding for the SFWMD SOR Program is the Water Management Lands Trust Fund, generated by a state documentary tax stamp. This funding source is augmented in several ways.

- *The SFWMD actively pursues revenue generation that is compatible with SOR goals and pursuant to the 1997 revisions of Section 253.034, F.S.S. This includes use of renewable resources where multi-use designation of the property exists, as is the case with SOR lands.*
- *The District seeks partnerships for implementation of its land management program, and has been successful in coordinating in-kind services with numerous state and local government entities, such as the FWC, FDOF, FDEP, county governments, private environmental groups, and volunteers.*
- *Grazing leases are obtained with land purchase or developed after purchase to use renewable resources.*
- *User groups and volunteers supply no-cost services for developing and maintaining public use facilities and participating in select land management activities.*
- *LSP seeks funding through mitigation banking and develops plans for use of these funds to restore, preserve, and manage Land Stewardship-managed lands.*

7.1.1.1 Off-Site Mitigation and Mitigation Banks

The following mitigation policies apply to all Land Stewardship-managed properties.

Policy 05.00115.a - Mitigation banking provides an opportunity to accomplish large-scale restoration that may otherwise go unfunded. Pursuant to Chapter 373.4135, F.S.S., the District was encouraged to develop mitigation banks. Land managers will

evaluate opportunities in their regions to implement mitigation banks that are consistent with the guidelines established in the Joint State and Federal Mitigation Bank Review Team Process for Florida.

Policy 05.00114.2b - Regional Mitigation Areas: The acquisition, restoration and management of District lands as mitigation shall be consistent with Chapter 373.414, F.S.S., and the District's Operational Protocol for Cash Payment as Mitigation. This includes the development of restoration plans to implement the mitigation using full-cost accounting, public noticing, and approval by the Governing Board of the mitigation area. The mitigation shall implement an identified restoration objective, approved by the land manager as developed in a management plan.

A significant source of additional funding for acquisition and management purposes are off-site mitigation projects and mitigation banking. Pursuant to Chapter 373.4135, F.S.S., the District is encouraged to develop mitigation banks. Land managers evaluate opportunities to implement mitigation banks in areas where the:

- *restoration is complex*
- *District Mitigation Banking Program's site selection criteria are utilized*
- *Site features and restoration plan are consistent with the guidelines established in the Joint State and Federal Mitigation Bank Review Team Process for Florida.*

LSP, in cooperation with the District Regulation Department, may designate priority enhancement or restoration areas in large, degraded wetland complexes. Potential enhancement/restoration areas include either public or private lands within the Save Our Rivers Land Acquisition and Management Plan (SFWMD 1999), or lands that have resource value and may be added to the plan in the future. Possible enhancement/restoration sites must have the potential to provide sustainable wetland functions after ecological restoration. As part of the GMP for each management area, Land Stewardship managers shall identify any significant potential enhancement/restoration areas in their region and develop a conceptual cost estimate to implement the work. This information shall be provided to the mitigation banking and regional mitigation area program coordinator who evaluates opportunities for enhancement/restoration. These opportunities include designation as a mitigation bank, a District-sponsored regional offsite mitigation area, or a priority project.

Within the LRCMA, there were four sites being used for off-site mitigation:

- Merritt Island (Park Equus tract)
- Rough Island-West (Universal tract)
- Rough Island-West (McKinney tract)
- Johnson Island.

For tracts such as Merritt Island (Park Equus) and Rough Island-West (where off-site mitigation projects have assumed full management responsibility) detailed management prescriptions will not be given in this plan. These tracts have site-specific management plans

that are filed at the District's Orlando Service Center. General terms of the projects are given below.

The Universal and Park Equus tracts are managed by TNC through its Disney Wilderness Reserve Program (under contracts C-7338-A01 and A02). TNC manages the tracts as off-site mitigation for development projects associated with Universal Studios and Park Equus. The Universal tract was donated fee-simple to the District, with a management endowment. The Park Equus tract was also donated fee-simple to the District; however, the management endowment is held by TNC. TNC has submitted site plans for both tracts (on file at the Orlando Service Center). As described in the contracts and site plans, TNC provides for all routine natural resource management needs of the two properties. Actions taken for extraordinary unforeseen management circumstances are decided by the District and TNC on a case-by-case basis. General contracts terms are given in Table 11.

Table 11: Off-site Mitigation Tracts Managed by The Nature Conservancy

Contract	Tract	Acres	Funds	Type	Start	End
C-7338-A1	Reedy Ck, Universal (201-002)	250	$192,302	District - Endowment	11/21/1996	11/20/2016
C-7338-A2	Reedy Ck, Park Equus (F6100053)	96	$3,343	TNC - Endowment	11/21/1996	11/20/2016

The McKinney tract is managed by PBS&J through a subcontract with the GOAA. GOAA negotiated the use and terms of the McKinney tract for off-site mitigation through the permitting process for build-outs of the Orlando International Airport. Under terms of the permit (#48-00063-S), GOAA purchased the property fee-title, donated the property to the District, provided a lump-sum endowment fund for perpetual management, submitted a restoration and enhancement plan for the property, and implemented the plan. The plan is stored on file at the Orlando Service Center. After success criteria for the restoration and enhancement plan is reached, management of the parcel will be turned over to the LSP in the year 2002. General terms of the permit are given in Table 12.

Table 12: Off-site Mitigation Tract for the Greater Orlando Aviation Authority

Contract	Tract	Acres	Funds	Type	Start	End
48-00063-S	McKinnney (201-001)	600	$255,700	District-Endowment	1/1/1998	1/1/2002

The remaining off-site mitigation project is located within the Johnson Island Unit. This mitigation involves enhancement of a marsh located near the southern end of the property, which was previously under District ownership. (Since this project does not involve acquisition, details are covered under Section 6.1.5 - Enhancement.)

<u>Management Objective</u>

- Use mitigation programs to preserve, restore, enhance, and manage natural resources within the LRCMA.

Management Actions

- Evaluate opportunities to implement mitigation banks in areas where the:
  - restoration is complex and expensive,
  - District Mitigation Banking Program's site selection criteria are utilized,
  - connectivity to other natural areas is provided.
- Site features and restoration plan are consistent with the guidelines established in the Joint State and Federal Mitigation Bank Review Team Process for Florida.
- Coordinate with District permitting staff for the development of off-site mitigation/preservation plans to be implemented within the LRCMA.
- Coordinate and oversee operations of existing mitigation sites within the LRCMA.

7.1.2 Personnel

A select group of District employees plan and manage the functions of the LSP (Appendix A). This group includes professional land managers assigned to regional service centers. Regional land managers have specific geographical responsibilities for comprehensive management in their respective areas, as well as special management expertise (law enforcement, prescribed fire, exotic control) that they share with other managers throughout the agency. A highly-trained field crew is based at Dupuis Reserve (Land Stewardship Field Crew), and supports the professional staff by performing diversified land mangement tasks throughout the District. LSP planning staff executes planning functions and evaluates and monitors LSP management. Student interns are hired on a project-specific, time-limited basis. Interns are recruited through the District's human Resources Division and the Student Conservation Association.

Successful management of the LRCMA is dependent upon the efficient and effective distribution of Land Stewardship personnel. Currently, there are two full-time professional land manager positions and a land management technician—based in the Orlando Service Center—who are responsible for management activities within the Management Area and serve as primary contacts (see Appendix A for contact information). District staff located outside of the region is available to assist the regional land managers for project-specific activities. Field crew members, from the District's Kissimmee Field Station, and student interns are available from time to time on a project basis.

Management Objective

- Provide the staff necessary to successfully attain management goals and objectives as outlined in GMPs, activity plans, and annual work plans for the LRCMA.

Management Actions

- Strive to maintain current levels of staffing through proper planning, reporting, budgeting, and personnel actions.
- Identify deficiencies in staffing levels and request appropriate staff additions to attain levels of responsible management as detailed in the GMP.

7.1.2.1 Volunteers and Alternative Work Force

By Florida State Statute (373.1391(3)), the District is encouraged to use volunteers and enter agreements with other governmental agencies to provide cost-effective land management. The following volunteer policies apply to all Land Stewardship-managed lands.

Policy 05.00114.4b - Any volunteer services must meet the standards and procedures prescribed by the District (Risk Management Manual Vol. 1).

Policy 05.00115.4a - Volunteers, interns, and alternative work forces will be used when possible to supplement existing staff and services.

Land management objectives are increasingly met by seeking alternative work force services and exploring innovative ways to supplement existing personnel. The District recognizes the merits of volunteerism and welcomes participation in activities appropriate for public involvement. Selection of appropriate management activities is at the discretion of the acting land manager under the general guidance of the supervising land manager. In addition, alternative work force programs are utilized for projects that require abundant manual labor with minimal technical skills. Agreements for use of work force personnel are arranged through the SFWMD's Human Resources Division or lead land management agency, and coordinated by the regional land manager.

From 1996-1999, LRCMA land managers have worked with volunteers from the Kissimmee River Valley Sportsmen's Association and the Osceola County Airboat Club when implementing land management activities. The volunteer activities included research, fencing and fence removal, perimeter sign posting, trash pickup, and airboat transportation within the Rough Island and Johnson Island Units. Additional groups are anticipated and are planned on an as-needed basis.

Under the cooperative agreement with the Osceola County School Board (as detailed in Section 6.4.4), numerous volunteers donated time and materials toward the development and operation of the environmental education facility at the Lake Russell Unit. These volunteers are recruited and coordinated by the Osceola County School Board. School Board use of volunteers is an essential component of the program and expected to continue throughout the duration of the contract.

Management Objective

- Use volunteer and alternative work force opportunities within the LRCMA.

Management Actions

- Solicit appropriate volunteer participation in the LRCMA.

- Encourage future participation from members of the Kissimmee River Valley Sportsmen's Association and the Osceola County Airboat Club in management activities within the LRCMA.
- Report volunteer efforts in quarterly reports.

7.1.3 Equipment

Staff has access to tools, supplies, equipment, four-wheel drive vehicles, vessels, fire suppression trucks, all terrain vehicles, swamp buggies, an airboat, a dump truck, tractors, a road grader, a backhoe, and a large plow. The District's Kissimmee Field Station crew and equipment, as well as leased equipment, are also available to assist in the Management Area on a limited basis.

Management Objective

- Provide the equipment, supplies, and tools necessary to successfully attain management objectives as outlined in the GMP, activity plans, and annual work plans for the LRCMA.

Management Actions

- Identify deficiencies in equipment and supply levels and request appropriate additions to attain levels of responsible management as detailed in the GMP.
- Maintain (and seek repairs to) all tools, supplies, and equipment to ensure good condition.

7.2 Planning

The LSP develops preliminary strategies to guide management activities for each project area. The strategies are defined in General Management Plans (GMP) developed by LSP planning personnel. Activity plans are created only for those management activities that require a detailed technical plan. General and activity plan content is standardized in a logical sequence to insure comprehensive coverage of pertinent issures and information.

7.2.1 General Management Plans

The following GMP policy applies to all Land Stewardship-managed lands.

Policy 05.00117.2 - General management plans provide a description of recommended management and is required for each Land Stewardship/Save Our Rivers Management Area. The general management plan follows a designated format and is updated every five years.

Each GMP is a guideline document that directs the land manager toward land management goals on a specified management area. The document defines goals and objectives, identifies and prioritizes major management needs and issues, serves as a management assessment and is expandable to adjust for discussion of future significant management requirements. GMPs are created or coordinated by the LSP planning section. Where joint management occurs, the lead management agency is responsible for management plan creation, with the plan subject to LSP review and District Governing Board approval.

Each plan is subject to a draft revision period where public comment and professional review is requested prior to plan finalization. GMPs are made available to all interested parties in print form or by access to a shared server site maintained by the LSP planning section. Each plan is reviewed on a five-year cycle by planning team staff (6.2.4).

This GMP is specifically for the LRCMA. The original GMP that included Reedy Creek was completed in 1992 (SFWMD 1992). This plan combined the Lake Marion Creek and Reedy Creek watersheds into one management area for conceptual planning. In 1999, a conceptual management plan was finalized separately for the Lake Marion Creek Management Area (Udelhoven 1999). The Reedy Creek watershed is now divided into the LRCMA and the Upper Reedy Creek Management Area for planning purposes.

Management Objective

- Provide a long-term planning document that fulfills statutory, FDEP-lease, and policy requirements, and provides a framework for management implementation and public oversight.

Management Actions

- The planning/inventory coordinator shall submit the Lower Reedy Creek Management Area Five-Year General Management Plan (2002-2007) for Governing Board approval.
- District staff shall review and revise the GMP every five years.

7.2.2 Activity Plans

The following activity plan policy applies to all Land Stewardship-managed lands.

Policy 05.00117.3 - Activity plans provide a detailed implementation strategy for specific activities such as prescribed burning, exotic removal, and restoration. The plan shall be developed by the lead manager in consultation with the cooperating agencies for each major tract of land (or groups of tracts) to be operated as a single management unit. Activity plans may be included in the general management plans and are updated when necessary.

The purpose of activity planning is to produce a document that details a plan of action for execution of a specified management activity. The plan provides technical detail, budget, manpower requirements, and timetables for project implementation. Acitivity plans are brief and concise, offering only that information pertaining directly to fieldwork. In most instances, these plans are produced by either the LSP land manager, under the general guidance of the supervising land manager; or the lead management agency, with review by the LSP land manager. The plan's life span is often several years, however, its progress is evaluated annually by land managers during annual work plan reviews. Activity plans are available for inspection at the land manager's regional office. As of July 2000, specific

Activity Plans available for the LRCMA included fire management, exotic plant control, and natural resources management (in Draft).

Management Objective
- To accomplish management goals, activity plans will be created for specific management activities.

Management Actions
- Finalize the Natural Resource Management and Review Activity Plan.
- Update, as necessary, the Fire Management Plan for the LRCMA.
- Develop an annual Exotic Plant Control Plan for the Upper Lakes Land Management Region, which includes the LRCMA.
- Coordinate with the KRREP to develop a Management Evaluation Plan for the LRCMA (and the Kissimmee Chain of Lakes Management Area).

7.2.3 Annual Work Plans

The following annual work plan policy applies to all Land Stewardship-managed lands.

Policy 05.00117.4 - Annual work plans summarize activities corresponding with annual budget development and are prepared by the Operations Section of the Land Stewardship Program.
Annual work plans, based on general management and activity plans, are developed each fiscal year. The annual work plans, including objectives and deadlines, determine on-site activities targeted for completion within the up-coming fiscal year.

Standardized annual work plans for the Upper Lakes Region (which includes the LRCMA) are developed each fiscal year based on general management and activity plans (Appendix K). This work plan will include oversight of activities planned by cooperative managers, and will be submitted to the Supervising Land Manager for inclusion into the District-wide LSP Annual Work Plan.

Management Objective
- Plan management activities on an annual basis to meet program objectives detailed in the GMP for the LRCMA.

Management Action
- Develop annual work plans based on activities identified in the GMP and Activity Plans.
- Develop annual work plans based on the standardized annual work plan format.
- Solicit annual work plans from cooperative contractual managers: the Osceola County School Board, The Nature Conservancy, and the GOAA/PBS&J.

7.3 Reporting

The following reporting policy applies to all Land Stewardship-managed lands.

05.001157.5 Reporting - Summaries of management activities for each management area will be reported quarterly within the District and annually as part of the Florida Forever Work Plan.

Land managers submit regional quarterly reports to the LSP office in West Palm Beach. These reports indicate progress toward achieving annual work plan objectives. Quarters are based on the District's fiscal year:
- *1st Quarter (October – December)*
- *2nd Quarter (January – March)*
- *3rd Quarter (April – June)*
- *4th Quarter (July – September)*

In addition to reporting those activities conducted by District staff, quarterly reports also contain information concerning activities conducted by cooperative managers, lessees, and contract personnel.

Management Objective
- Track and report progress in attaining management goals.

Management Actions
- Consolidate and report management accomplishments on a quarterly basis, using a standardized format similar to the annual work plan.
- Include management information on quarterly reports from the Osceola County School Board, TNC, FWC, the GOAA/PBS&J, and the cattle lessees.
- Work with cattle lessees to develop a system of reporting for activities they conduct on District lands under terms of the lease, deed or reservation.

7.4 External Entity Coordination

The following lease-agreement policy applies to all Land Stewardship-managed lands.

Policy 05.00115.1 - The private sector may be solicited to furnish certain management-related facilities and services through the execution of leases and agreements. These leases/agreements will assure mutual benefits to both the District and private parties and be consistent with the program objectives.

Effective management of SOR properties requires the cooperation of state and local agencies, private organizations, and volunteers, all which have varied interests and motivation for participating in land management operations. Frequently, contractual employees and non-contract co-operatives augment District manpower to complete tasks and meet management goals. Management planning requires consideration of neighbors as potential collaborators where there may be common benefit.

The Kissimmee Chain of Lakes Land Management Advisory Committee, initiated in 1995, will continue to provide management oversight and recommendations for the Rough Island and Johnson Island Management Units (see Appendix I for policies and goals). The Committee is composed of members of the recreational, environmental, agricultural, neighborhood and governmental communities, and provides non-contractual management cooperation. Committee meetings are held on an as-needed basis (typically quarterly).

In 1999, the District's Governing Board directed Land Stewardship staff to seek cooperation and/or direction from the FDEP for management of the LRCMA. Land Stewardship staff researched available options to protect waterways, many of which were directly associated with FDEP programs. Others were associated with FWC programs and legislative designations (see Section 6.1.5). District staff initiated dialogue with FDEP and FWC in the spring of 2000 concerning the development of a comprehensive management strategy. The District is dedicated to finding a long-term protective strategy and believes cooperation with FDEP and FWC is essential.

Management Objective

- Protect the natural and cultural resources within the LRCMA through coordination with interested external entities.

Management Action

- Continue to schedule and coordinate activities for the Kissimmee Chain of Lakes Land Management Advisory Committee.
- Continue dialogue with the FDEP and FWC, working towards the development of a long-term, comprehensive, cooperative protective strategy for the LRCMA.

7.4.1 Contractual Management

With the continued acquisition of SOR lands and limited District staffing, it has become necessary to enter into contractual agreements with external entities for land management services. Contractual management is provided by legal management agreements signed by the District and contracting entity, with the document defining responsibilities of each party. The agreements may designate the contractor as lead land manager, or as a service provider that performs a select management duty, such as resource protection or game management. Under contractual management, the lead managing entity is charged with performing their services in accordance with the SOR Program (Section 373.59, F.S.S.) and District Policy 5.001. The lead management entity is responsible for producing a GMP that is subject to review by the LSP prior to Governing Board approval. The contractual lead management entity also provides an annual work summary to the LSP, with review of the GMP every five years. Management contractors submit periodic summaries of work plans and accomplishments to the regional land manager.

A summary of all contractual cooperative agreements can be found in Table 14. A contractual cooperative management agreement that has been discussed conceptually is the

management of the Johnson Island Unit by The Nature Conservancy. TNC owns and manages an 11,500-acre nature preserve (the Disney Wilderness Preserve) immediately north of the Johnson Island Unit. Most management activities that are implemented on Johnson Island are similarly implemented on TNC's preserve. District staff and contractors must traverse five to six miles of TNC's preserve to access the Johnson Island Unit. Also, TNC has on-site staff and facility at the preserve, which would facilitate day-to-day management of the Johnson Island Unit. District staff may submit a formal proposal to TNC to proceed with contract negotiations.

Management Objective

- Improve management efficiency and effectiveness of the LRCMA by entering into and/or maintaining long-term cooperative land management agreements with other management entities.

Management Actions

- Maintain communication with and oversee efforts of contractual managers, cooperators, lessees, and staff working in the LRCMA.
- Determine the effectiveness and efficiency of entering into a contractual agreement with TNC for the management of the Johnson Island Unit.
- Negotiate and implement a contractual agreement with TNC for the management of the Johnson Island Unit if deemed appropriate.
- Seek additional opportunities to enter into cooperative contractual agreements for management services in the LRCMA.

Table 13: Contract Summary for the Lower Reedy Creek Management Area

MANAGEMENT AREA - UNIT	CONTRACT TYPE	CONTRACT ENTITY	CONTRACT NUMBER	IMPLEMENTATION DATES
Total Area of Lower Reedy Creek MA	As of July 2000 - Unknown	Florida Department of Environmental Protection	As of July 2000 - Conceptual Stage Only	As of July 2000 - Conceptual Stage Only
Total Area of Lower Reedy Creek MA	Enhanced Law Enforcement Patrol	Florida Fish and Wildlife Conservation Commission	C-10162	1999 - 2024
Total Area of Lower Reedy Creek MA	Exchange of Ecological Data	Florida Natural Areas Inventory	C- 9341	1998 – 2001
Total Area of Lower Reedy Creek MA	Exotic Plant Eradication	Applied Aquatics Management, Inc.	C- 9559	1998 – 2001
Lake Russell Unit	Environmental Education and Public Use Development	Osceola County School Board	C-7947	1996 - 2021
Lake Russell Unit	Swamp Enhancement	As of July 2000 – To Be Bid	As of July 2000 – To Be Bid	Completed 2001
Merritt Island Unit (Park Equus)	Complete Management	The Nature Conservancy	C-7338-A02	1996 - 2016
Rough Island-West Unit (Universal)	Complete Management	The Nature Conservancy	C-7338-A01	1996 - 2016
Rough Island-West Unit (McKinney)	Complete Management, Restoration, and Enhancement	Greater Orlando Aviation Authority – Post, Buckley, Schuh & Jernigan, Inc.	Permit # 48-00063-S	1998 - 2002
Rough Island-South	Cattle Grazing Lease	Jennings Overstreet	C-3239	1991 - 2016
Rough Island-North	Cattle Grazing Reservation	Drew Kelley - Southport Ranch, Inc.	Deed Agreement	1997 - 2018
Rough Island-North and South	Ecological Inventory	Chuck Hilsenbeck	C- 9340	Completed 2001
Rough Island and Johnson Island Units	Management of Sovereign Lands	Florida Department of Environmental Protection	# 4099	1995 - 2045
Rough Island and Johnson Island Units	Game & Hunting Management	Florida Fish and Wildlife Conservation Commission	As of July 2000 - Conceptual Stage Only	As of July 2000 - Conceptual Stage Only
Johnson Island Unit	Cattle Grazing Lease	As of July 2000 – To Be Bid	As of July 2000 – To Be Bid	As of July 2000 – To Be Bid
Johnson Island Unit	Marsh Enhancement	As of July 2000 – To Be Bid	As of July 2000 – To Be Bid	Completed 2001
Johnson Island Unit	Complete Management	The Nature Conservancy	As of July 2000 - Conceptual Stage Only	As of July 2000 - Conceptual Stage Only

7.4.2 Non-contractual Management

In certain circumstances, it is expedient to coordinate management activities without the benefit of a contract. These non-contractual agreements are usually the result of a long-standing interest of private individuals or groups in select parcels of Land Stewardship properties, but may also involve government agencies with common land management goals. Where mutual benefit is derived by cooperator participation in land management, defined management tasks may be delegated to them without legal documentation. Selection of appropriate management activities and projects for non-contractual agreement is at the discretion of the regional land manager, with review of the LSP division director and supervising land manager.

Management Objective

- Improve management efficiency by cooperating with other management entities in as-needed, non-contractual arrangements.

Management Action

- Seek opportunities to cooperate with other land management entities on a short-term, informal basis.

7.4.3 Adjacent Landowner Coordination

SOR projects are part of larger functioning ecosystems. Land management objectives must reflect the inter-connected relationship of their management areas with adjacent land parcels, and be cognizant of the entire system when conducting land management activities. Management planning includes review of adjacent land use, and considers potential impacts to neighboring parcels. Where possible, land managers coordinate with adjacent landowners to alleviate potential land use conflicts, conduct mutually beneficial management actions, or provide multiple use resource opportunities. Coordination efforts can strengthen stewardship bonds between local District staff and neighboring property owners, providing a welcome forum for discussion of potential or perceived land management problems. Regional land managers are the main interface with local landowners, and are responsible for responding to requests, concerns, and complaints about land management procedures. Issues that cannot be resolved at the regional level are referred to the supervising land manager or LSP Department Director for resolution.

TNC (to the north and west) and Southport Ranch, Inc. (to the north and east) own property adjacent to the LRCMA. Public waters abut the Management Area to the south. TNC and Southport Ranch, Inc. are involved with District management through formal contracts and deeds, but also participate informally on land management committees and during day-to-day interactions.

Management Objective

- Coordinate land management activities in the LRCMA with adjacent landowners.

Management Actions

- Contact TNC and Southport Ranch, Inc. to provide them with timely information concerning activities that may affect them (i.e., burning, construction, public use, research, herbicide treatment, site visits).
- Attempt to establish working relationships with other adjacent property owners.

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Appendix A: Contact List for the Lower Reedy Creek Management Area

Florida Department of State, Division of Historical Resources
Heather Percy, Florida master Site File
R.A. Gray Building, 500 South Borough,Tallahassee, FL 32399-0250
Tel: (850) 488-1480; Fax: (850) 488-3353

Florida Division of Forestry, Department of Agriculture
Polk County – District 14 Office
Mark Hebb, District Manager
Gary Zipper, Area Supervisor
5745 S. Florida Avenue, Lakeland, Florida 33813
Tel: (941) 648-3163, Fax: (941) 648-3169

Florida Division of Forestry, Department of Agriculture
Osceola County - District 12 Office
John Koehler, District Manager
Tom Donahoe, Area Supervisor
8431 South Orange Blossom Trail, Orlando, FL 32809
Tel: (407) 856-6512, Fax: (407) 856-6514

Florida Fish and Wildlife Conservation Commission, South Region
Wildlife Management Area proposal contacts and Law Enforcement
1239 S.W. 10th Street, Ocala, Florida 34474-2797
Telephone 1-800-282-8002

Florida Fish and Wildlife Conservation Commission, South Region
Law Enforcement
3900 Drane Field Road, Lakeland, FL 33811
Tel: (941) 648-3200, Fax: (941) 680-5594

Florida Fish and Wildlife Conservation Commission
Office of Environmental Services
Sharon Arnold, Records Technician
620 South Meridian Street, Tallahassee, FL 32399-1600
Tel: (904) 488-6661, Fax: (904) 922-5679

Greater Orlando Aviation Authority
Bob Bernard
1 Airport Blvd., Orlando, Florida 32827
Tel: (407) 825-3883

Osceola County Fire Department
17 South Vernon Avenue, Kissimmee, Florida 34741
Non-Emergency: (407) 932-5338
Dispatch Tel: (407) 348-8688
Emergency Telephone: 911

Osceola County Sheriff's Office
400 Simpson Road, Kissimmee, FL 34744-4494
Non-Emergency Telephone: (407) 348-2222
Emergency Telephone: 911

Polk County Fire Services
P.O. Box 1458, Bartow, Florida 33831
Non-Emergency Telephone: (941) 534-0380
Communications Center: (941) 534-0360
Emergency Telephone: 911

Polk County Sheriff's Office
455 N. Broadway Avenue, Bartow, FL 33830-3998
Non-Emergency Telephone: (941) 533-0444
Emergency Telephone: 911

Post, Buckley, Schuh & Jernigan, Inc.,
Butch Neal , 1560 Orange Avenue, Suite 700, Winter Park, Florida 32789
Tel: (407) 647-7275, Fax: (407) 647-0624

South Florida Water Management District, Dupuis Reserve
Pete David, Land Management Supervisor
Dennis Driggers, Supervising Land Management Technician, Field Crew
David Black, Monitoring Coordinator
23500 S.W. Kanner Highway
Canal Point, Florida 33438
Telephone: (561) 924-5310

South Florida Water Management District, Headquarters
Fred Davis, Department Director
Janetta Worth, Recreation Planner
Doris Anderson, Acquisition Negotiator
Bill Helfferich, Senior Supervising Planner
Darla Fousek, Planning/Inventory Coordinator
Marjorie Moore, Mitigation Area Program Coordinator
3301 Gun Club Road, West Palm Beach, Florida 33406
Telephone: 1-800-686-2511 Fax: (561) 681-6233

South Florida Water Management District, Orlando Service Center
Upper Lakes Regional Land Manager, Resource Protection Coordinator, LSP
David Birdsall, Upper Lakes Land Manager, LSP
Vincent Matera, Upper Lakes Land Management Technician, LSP
7335 Lake Ellenor Drive
Orlando, Florida 32809
Telephone: 1-800-250-4250

South Florida Water Management District, Okeechobee Service Center
Jeff Mclemore, Forestry Coordinator
Harold Price, Range Coordinator
205 North Parrot Avenue, Suite 201,Okeechobee, Florida 34972
Telephone: 1-800-250-4200
Fax: (863) 462-5269

Student Conservation Association, Inc.
689 River Road
P.O. Box 550
Charlestown, NH 03603
Telephone: (603) 543-1700
www.sca-inc.org

United States Army Corps of Engineers
Bill Cavitt
6406 U. S. Highway 27
Sebring, Florida 33870
Telephone: (813) 840-0824

United States Fish and Wildlife Service
P.O. Box 2676
Vero Beach, Florida 32961
Telephone (561) 562-3909

Appendix B: Ownership - Tract Information

MANAGEMENT UNIT	TRACT NUMBER	TYPE OF OWNERSHIP	NUMBER OF ACRES	PREVIOUS OWNER	DETAILS
Lake Russell	RC 100-005	Fee	493	Friedman	
	RC 100-009	Fee	33		
Merritt Island	F7 100-053	Fee	96	Al Marah, Inc.	Off-site mitigation
Rough Island-North	CYP 200-002	Flowage	592	Southport Ranch	
	HAT/CYP 200-004	Fee	689	Southport Ranch	Grazing Reservation
Rough Island-South	HAT/CYP 200-003	Fee	379	Overstreet	Grazing Lease-back
	CYP 200-001	Fee	1354	Overstreet	Grazing Lease-back
Rough Island-West	HAT/CYP 201-001	Fee	600	McKinney	Off-site mitigation
	CYP 201-002	Fee	250	Universal	Off-site mitigation
	CYP 201-003	Fee	0	Universal	Off-site mitigation
	CYP 201-004	Fee	18	Major Realty	Off-site mitigation
	CYP 201-005	Fee	27	The Nature Conservancy	Donation
Johnson Island-	HAT 109-001	Fee	1726	Chandler	
		Total Acres	6257		

Appendix C: Burn Prescription

Authorization No. Burn Date

FIRE PRESCRIPTION
FIELD OPERATIONS - Land Stewardship Program
Orlando Service Center
South Florida Water Management District
7335 Lake Ellenor Drive, Orlando, Florida 32809
Telephone:(800) 250-4250

SFWMD Parcel: **S T R**
County:
Burn Unit Number:
Acres to Burn: ac.
Distance to Disk: mile(s)
Burn Unit vegetation:

Overstory Type and Height:

Understory Type and Height:

Fuel Loading: High Medium Low
Date of last fire:
Topography and Soil:
Purpose of Burn:
- Reduce the fuel load.
- Reintroduce fire into the system.
- Burn to manage fire adapted communities.
- Maintain or enhance natural community.

Ignition Plan:
- Backfire downwind side
- Strip head
- Flank

Special Precautions: Clear area of nonessential personnel. Close/lock gate to prevent hikers from accessing the area.

No Burn Situation: Dry, muck soil.

Range of Desired Weather	**Preferred**	**Actual**
Surface Winds (speed and direction):	mph N - E - S - W	
Transport Winds (speed and direction):	mph N - E - S - W Mixing Height: feet	
Min. Relative Humidity:	%	
Max. Temperature:	degrees	

Dispersion Index:
Days since Rain:
Fine Fuel Moisture estimate

Fire Behavior

Type of Fire: Strip, Back, Flank, Head
Flame Length: ft.
Desired Fire Intensity: HOT 5 4 3 2 1 COOL
Preferred Month(s) of Burn: season. J F M A M J J A S O N D
Starting Time: am

Appendix C: Burn Prescription (continued)

Smoke Management (See fire plan for more details)
Smoke Screening Passed -
Smoke Sensitive Areas:
Smoke Precautions: Monitor smoke column.

Adjacent landowner Contacts:

Routine Contacts:
SFWMD (Fred Davis, Director, Land Stewardship): 561-687-6636
LSD Field Office: 561-924-5310 (DuPuis Reserve)
SFWMD (Olivia McLean, Emergency Manager): 561-687-6218
DOF District Office (Dundee): (941)421-3702/Lakeland 941)648-3163.
Kissimmee Field Station: (407)847-5067
Florida Power (let dispatch know) 1-800-700-8744

Required Resources: 6 burners (3 operators), 2 pumper units, dozer or tractor with disk or loader, 2 ATVs, smoke signs.

Holding and Contingency:

Mop up: Extinguish all visible and smoldering flames. Check perimeter.

Fire out: When mop up is complete.

Safety Check: PPE for entire crew. All equipment operational and in position.

Immediate Evaluation
Burn objectives met:
Spotover/Escapes:
Smoke Problems:
Public Contacts:
Other observations (Wildlife etc.): _____
Prescription done by
Certified Burn Manager Signature_____

Certification No. Date of Prescription:

APPENDIX D: PLANTS OF THE LOWER REEDY CREEK MANAGEMENT AREA

Endangered (**F**ed/**S**tate) **Threaten**ed (**F**ed/**S**tate)
Species of Special **Concern** (**S**tate) **FNAI** listed species

Data source: FNAI, GOAA, TNC, FWC, Hilsenbeck, Bridges & Reese, and LSP Resource Evaluation Program

Scientific Binomial	Common Name	Status	Management Unit					
			Lake Russ	Merritt Isl	Rough Isl-N	Rough Isl-S	Rough Isl-W	Johnson Isl
Acer rubrum	Southern red maple		+	+	+	+	+	
Acrostichum danaeifolium	Giant Leather Fern	Commercially Exploited - FDA					+	
Aletris lutea	Yellow colic-root				+	+		
Alternanthera philoxeroides	Alligator weed				+	+		
Amaranthus spinosus	Spiny pigweed				+	+		
Ambrosia artemisiifolia	Common ragweed				+	+		
Ampelopsis arborea	Pepper vine		+		+	+		
Amphicarpum muhlenbergianum	Blue maidencane		+		+	+		
Andropogon brachystachyus	Short-spiked bluestem		+					
Andropogon floridanus	Florida bluestem		+					
Andropogon glomeratus	Bushy beardgrass		+		+	+		
Andropogon gyrans v. gyrans	Elliott's bluestem		+					
Andropogon ternarius v. cabanisii	Silver bluestem		+					
Andropogon virginicus v. decipiens	Broom sedge		+	+			+	
Andropogon virginicus v. glaucopsis	Chalky bluestem		+		+	+		
Andropogon virginicus v. virginicus	Beardgrass		+		+	+		
Apios americana	Groundnut		+					
Aristida beyrichiana	Wiregrass		+					
Aristida gyrans	Corkscrew threeawn		+					
Aristida purpurescens	Arrowfeather		+		+	+		
Aristida spiciformis	Bottlebrush threeawn grass		+		+	+		
Aristida stricta	Wiregrass		+	+	+	+		
Asclepias currassavica	Scarlet milkweed					+		
Asclepias pedicellata	Savannah milkweed		+					
Asclepias perennis	Aquatic milkweed		+		+			
Asimina obovata	Big-flower pawpaw		+					
Asimina reticulata	Flatwoods pawpaw		+		+	+		
Aster carolinianus	Climbing aster		+		+	+		
Aster reticulatus	Pine barren white-top aster		+					
Aster subulatus	Annual marsh aster				+	+		
Aster tortifolius	White-topped aster		+					
Axonopus furcatus	Carpetgrass		+		+	+	+	
Azolla caroliniana	Mosquito fern				+	+		
Baccharis glomeruliflora	Groundsel tree		+					
Baccharis halimifolia	Groundsel bush		+		+	+		
Bacopa carolinana	Aromatic figwort		+		+	+		
Bacopa monnieri	Low figwort				+	+		
Balduina angustifolia	Coastal-plain honeycomb head		+					

APPENDIX D: PLANTS OF THE LOWER REEDY CREEK MANAGEMENT AREA continued

Scientific Binomial	Common Name	Status	Management Unit					
			Lake Russ	Merritt Isl	Rough Isl-N	Rough Isl-S	Rough Isl-W	Johnson Isl
Befaria racemosa	Tarflower		+					
Bidens alba v. radiata	Common begger-tick		+					
Bidens bipinnata	Spanish needles				+	+		
Bidens laevis	Bur marigold				+	+		
Bidens mitis	Marsh begger-tick		+		+	+		
Blechnum serrulatum	Toothed mid-sorus fern		+					
Boehmeria cylindrica	False nettle		+		+	+		
Buchnera americana	Bluehearts		+		+	+		
Bulbostylis ciliatifolia	Hair sedge		+		+	+		
Bulbostylis warei	Hair sedge				+	+		
Bumelia reclinata	Shrubby buckthorn				+	+		
Callicarpa americana	Beautyberry		+		+	+		
Calystegia sepium	White-flowered bindweed				+	+		
Campyloneurum phyllitidus	Strap fern	Endanger (FDA)					+	
Canna flaccida	Yellow canna		+					
Carex alata	Broadwinged sedge		+					
Carex gigantea	Large sedge		+					
Carex lupuliformis	False hop sedge		+					
Carex verrucosa	Warty sedge		+					
Carphephorus corymbosus	Coastal-plain chaffhead		+					
Carphephorus odoratissimus	Vanilla plant		+					
Carphephorus paniculatus	Hairy chaffhead		+					
Cassia obtusifolia	Sicklepod				+	+		
Cassia occidentalis	Coffee senna				+	+		
Celtis laevigata	Hackberry				+	+		
Cenchrus echinatus	Southern sandspur		+					
Centella asiatica	Coinwort		+		+	+		
Cephalanthus occidentalis	Buttonbush		+		+	+		
Ceratiola ericoides	Florida rosemary		+					
Chamaecrista nictitans v. nictitans	Sensitive partridge pea		+					
Chapmannia floridana	Florida alicia		+					
Chenopodium ambrosioides	American wormseed		+					
Chrysopsis scabrella	Coastal-plain golden-aster		+					
Cinnamonum camphora	Camphor-tree	**Exotic**			+	+		
Cirsium horridulum	Thistle		+		+	+		
Citrus aurantium	Sour orange	**Exotic**			+	+		
Cladium jamaicense	Sawgrass		+		+	+	+	
Clematis crispa	Swamp leather flower		+					
Commelina diffusa	Dayflower				+	+		
Conoclinium coelestinum	Blue mistflower					+		
Conzya canadensis	Sneezeweed		+		+	+		
Coreopsis leavenworthii	Pineland tickseed				+	+		
Cornus foemina	Swamp dogwood		+					

APPENDIX D: PLANTS OF THE LOWER REEDY CREEK MANAGEMENT AREA continued

Scientific Binomial	Common Name	Status	Management Unit					
			Lake Russ	Merritt Isl	Rough Isl-N	Rough Isl-S	Rough Isl-W	Johnson Isl
Crotalaria pallida v. obovata	Smooth rattlebox		+					
Crotalaria rotundifolia	Prostate rattlebox		+					
Crotonopsis linearis	Rushfoil				+	+		
Cuphea carthagenensis	Common waxweed				+	+		
Cynanchum scoparium	Vine milkweed				+	+		
Cynodon dactylon	Bermuda grass	**Exotic**			+	+		
Cyperus croceus	Baldwin flatsedge		+					
Cyperus esculentus	Yellow nutgrass				+	+		
Cyperus flavescens	Yellow sedge				+	+		
Cyperus haspan	Pond sedge		+		+	+		
Cyperus lecontei	Leconte's flatsedge		+					
Cyperus ligularis	Snail rush				+	+		
Cyperus odoratus	Fragrant sedge				+	+		
Cyperus polystachyos v. texensis	Many-spiked sedge		+		+	+		
Cyperus retrorsus	Pine-barren flat sedge		+					
Cyperus rotundus	Common sedge				+	+		
Cyperus stringosus	Sharp rush				+	+		
Cyperus surinamensis	Flat rush		+		+	+		
Cyperus virens	Greenish sedge				+	+		
Desmodium triflorum	Beggar's lice				+	+		
Dichanthelium commutatum	Broad-leaf panicum		+		+	+		
Dichanthelium dichotomum	Cypress witchgrass		+					
Dichanthelium ensifolium v. unciphyllum	Panic grass		+					
Dichanthelium laxiflorum	Drooping panicum				+	+		
Dichanthelium portoricense	Hemlock witchgrass		+					
Dichanthelium strigosum v. glabrescens	Panic grass		+					
Dichromena colorata	Fine-leaved white-top sedge				+	+		
Dichromena latifolia	White-top sedge				+	+		
Digitaria cilaris	Southern crabgrass		+		+	+		
Digitaria sanguinalis	Common crabgrass				+	+		
Diodia teres	Poor joe		+		+	+		
Diodia virginiana	Buttonweed		+		+	+		
Diospyros virginana	Persimmon		+		+	+		
Drosera brevifolia	Dwarf sundew		+					
Echinochloa crusgalli	Barnyard grass				+	+		
Echinodorus parvulus	Dwarf burhead				+	+		
Eclipta alba	Yerba-de-tago				+	+		
Eichhornia crassipes	Water hyacinth	**Exotic**			+	+		
Eleocharis baldwinii	Roadgrass		+		+	+		
Eleocharis cellulosa	Septate spikerush				+	+		
Eleocharis vivipara	Tiny spikerush		+		+	+		
Elephantopus elatus	Florida elephant's foot		+		+	+		

APPENDIX D: PLANTS OF THE LOWER REEDY CREEK MANAGEMENT AREA continued

Scientific Binomial	Common Name	Status	Management Unit					
			Lake Russ	Merritt Isl	Rough Isl-N	Rough Isl-S	Rough Isl-W	Johnson Isl
Eleusine indica	Yard grass		+		+	+		
Encyclia tampensis	Butterfly orchid	**Concern (S)**	+		+	+		
Eragrostis spectabilis	Purple love grass				+	+		
Eragrostis virginica	Meadow love grass		+					
Erigeron quercifolius	Southern fleabane				+	+		
Erigeron vernus	Fleabane		+		+	+		
Eriocaulon compressum	Soft-head pipewort				+	+		
Eriocaulon decangulare	Hard-head pipewort				+	+		
Eryngium baldwinii	Baldwin's eryngo		+			+		
Eupatorium capillifolium	Dog fennel		+		+	+		
Eupatorium coelestinum	Mistflower				+			
Eupatorium recurvans	Coastal plain thoroughwart		+					
Eupatorium rotundifolium	Round-lead thoroughwart		+					
Euthamia minor	Flat-topped goldenrod				+	+		
Euthamia tenuifolia	Flat-topped goldenrod		+		+	+		
Ficus aurea	Strangler fig				+	+		
Fimbrystylis autumnalis	Brown-top sedge				+	+		
Fimbrystylis dichotoma	Woolly fimbry		+					
Fimbrystylis miliacea	Annual brown-top sedge				+	+		
Fimbrystylis puberula	Vahl's hairy fimbry		+					
Fraxinus caroliniana	Water ash		+					
Fraxinus pennsylvanica	Red/Green Ash		+					
Fuirena scirpoidea	Narrow umbrella grass				+	+		
Galactia elliottii	White milk pea		+		+	+		
Galium tinctorium	Stiff marsh bedstraw		+					
Gaylussacia dumosa	Dwarf huckleberry		+					
Gaylussacia nana	Creeping huckleberry		+					
Gelsemium sempervirens	Yellow jesmine		+					
Gnaphalium falcatum	Cudweed				+	+		
Gnaphalium obtusifolium	Sweet everlasting		+		+	+		
Gordonia lasianthus	Loblolly bay		+				+	
Gratiola hispida	Rough-hedge hyssop		+					
Gratiola pilosa	Harry-hedge hyssop					+		
Gymnopogon chapmanianus	Chapman's skeleton grass	**FNAI**	+					
Hedyotis uniflora	Flat-top bluet		+					
Helianthemum corybosum	Clustered rock-rose		+		+	+		
Heliotropium polyphyllum	Pineland heliotrope				+	+		
Heterotheca subaxillaris	Camphorweed				+	+		
Hibiscus coccineus	Red swamp hibiscus				+			
Hibiscus grandiflorus	Swamp hibiscus				+	+		
Hieracium gronovii	Hawkweed				+	+		
Hieracium megacephalon	Hawk's beard		+					

APPENDIX D: PLANTS OF THE LOWER REEDY CREEK MANAGEMENT AREA continued

Scientific Binomial	Common Name	Status	Management Unit					
			Lake Russ	Merritt Isl	Rough Isl-N	Rough Isl-S	Rough Isl-W	Johnson Isl
Hydrochloa caroliniensis	Watergrass						+	
Hydrocotyle ranunculoides	Floating pennywort		+					
Hydrocotyle umbellata	Water pennywort		+		+	+		
Hydrocotyle verticillata	Whorled pennywort		+					
Hypericum cistifolium	Roung-pod St. John's wort		+					
Hypericum fasciculatum	Sandweed				+	+		
Hypericum hypericoides	St. Andrew's cross		+		+	+		
Hypericum mutilum	Dwarf St. John's wort		+		+	+		
Hypericum reductum	Atlantic St. John's wort		+					
Hypericum tetrapetalum	Heart-leaved St. Peter's wort		+		+	+		
Hypoxis juncea	Common stargrass		+					
Hyptis alata	Musky mint		+		+	+		
Ilex cassine	Dahoon holly		+		+	+	+	
Ilex glabra	Gallberry		+	+	+	+		
Indigofera hirsuta	Rough hairy indigo		+					
Ipomoea sagittata	Glades morning glory		+			+		
Iris hexagona v. savannarum	Prairie iris		+				+	
Itea virginica	Virginia willow		+					
Iva microcephala	Narrow-leaved elder				+	+		
Juncus dichotomus	Forked rush		+					
Juncus effusus	Soft rush		+		+	+	+	
Juncus marginatus v. biflorus	Grass-leaf rush		+					
Juncus polycephalus	Common rush		+		+	+		
Juncus scirpoides	Needle-pod rush		+					
Justicia angusta	Narrow-leaved water willow				+	+		
Lachnanthes caroliniana	Bloodroot		+		+	+		
Lachnocaulon anceps	White bog button		+		+	+		
Lachnocaulon beyrichianum	Little bog button		+		+	+		
Lachnocaulon minus	Little brown bog button				+	+		
Lechea torreyi	Piedmont pinweed		+					
Leersia hexandra	Southern cutgrass		+					
Leptochloa fascicularis	Bearded sprangletop				+	+		
Liatris gracilis	Blazing star		+					
Liatris tenuifolia v. quadriflora	Blazing star		+					
Licania michauxii	Gopher apple		+					
Linaria canadensis	Blue toadflax				+	+		
Linaria floridana	Florida toadflax		+					
Lindernia anagallidea	False pimpernel		+					
Lindernia grandiflora	Savannah false pimpernel		+		+	+		
Lipocarpha maculata	Common ditchgrass				+	+		
Lippia nodiflora	Frog's bit				+	+		
Liquidambar styraciflua	Sweetgum		+				+	
Ludwigia arcuata	Piedmont primrose willow		+					

APPENDIX D: PLANTS OF THE LOWER REEDY CREEK MANAGEMENT AREA continued

Scientific Binomial	Common Name	Status	Management Unit					
			Lake Russ	Merritt Isl	Rough Isl-N	Rough Isl-S	Rough Isl-W	Johnson Isl
Ludwigia maritima	Coastal plain seedbox		+		+	+		
Ludwigia microcarpa	Tiny seedbox				+	+		
Ludwigia peruviana	Primrose willow		+		+	+	+	
Ludwigia repens	Floating water-primrose		+		+	+		
Ludwigia suffruticosa	Shrubby primrose willow					+		
Lycopus rubellus	Taper-leaf water hoarhound		+					
Lygodesmia aphylla	Rosebush		+					
Lyonia ferruginea	Rusty lyonia		+					
Lyonia fruticosa	Coastal plain stagger-bush		+					
Lyonia ligustrina v. foliosiflora	Maleberry		+					
Lyonia lucidia	Fetterbush		+	+				
Magnolia virginiana	Sweet bay		+	+	+	+	+	
Melia azedarach	Chinaberry	**Exotic**	+		+	+		
Melothria pendula	Melonette				+	+		
Micranthemum glomeratum	Mudflower				+	+		
Mitchella repens	Twinberry		+					
Mitreola sessilifolia	Miterwort				+	+		
Myrica cerifera	Wax myrtle		+	+	+	+	+	
Nephrolepis exaltata	Boston fern		+					
Nymphea odorata	White waterlily				+	+	+	
Nymphoides aquatica	Floating hearts				+	+		
Nyssa biflora	Black gum			+	+	+	+	
Nyssa sylvatica v. biflora	Swamp tupelo		+				+	
Oplismenus setarius	Woodsgrass				+	+		
Opuntia humifusa	Prickly-pear cactus		+					
Opuntia pusilla	Cock's-spur prickly pear		+					
Osmunda cinnamomea	Cinnamon fern	**Concern (S)**	+	+	+		+	
Osmunda regalis	Royal fern	**Concern (S)**	+		+	+		
Oxallis corniculata	Creeping wood sorrel					+		
Palafoxia feayi	Feay's palafox		+					
Panicum anceps	Beaked panicum		+					
Panicum dichotomiflorum	Fall panicum				+	+		
Panicum gymnocarpon	Savannah panicum				+			
Panicum hemitomum	Maidencane		+		+	+		
Panicum longifolium	Panic grass		+					
Panicum repens	Torpedo grass		+					
Panicum rigidulum	Redtop panic grass		+					
Panicum verrucosum	Warty panicum		+		+	+		
Parthenocissus quinquefolia	Virginia creeper		+		+	+		
Paspalum notatum	Bahia grass	**Exotic**	+	+	+	+	+	
Paspalum setaceum	Thin paspalum		+		+	+		
Persea borbonia	Red bay				+	+		

APPENDIX D: PLANTS OF THE LOWER REEDY CREEK MANAGEMENT AREA continued

Scientific Binomial	Common Name	Status	Management Unit					
			Lake Russ	Merritt Isl	Rough Isl-N	Rough Isl-S	Rough Isl-W	Johnson Isl
Persea palustris	Swamp bay		+					
Petiveria alliacea	Guinea-hen weed				+	+		
Phanopyrum gymnocarpon	Savannah panicum		+					
Phlebodium aureum	Golden serpent fern		+		+	+		
Phoebanthus grandiflorus	Florida false sunflower		+					
Phoradendron leucarpum	Oak mistletoe		+					
Phoradendron serotinum	Mistletoe				+			
Phytolacca americana	Pokeberry				+	+		
Piloblephis rigida	Wild penny royal		+					
Pinguicula lutea	Yellow butterwort	**Threaten (S)**	+					
Pinguicula pumila	Small butterwort		+					
Pinus clausa	Sand pine		+					
Pinus elliottii	Florida slash pine		+	+	+	+	+	
Pinus palustris	Longleaf pine		+					
Pinus serotina	Pond pine						+	
Piriqueta caroliniensis	Piriqueta				+	+		
Pistia stratiotes	Water lettuce	~ Exotic					+	
Pityopsis graminifolia v. latifolia	Golden aster		+					
Plantago major	Common plantain					+		
Pluchea odorata	Marsh fleabane		+		+	+		
Pluchea rosea	Godfrey's fleabane				+	+		
Polygala grandiflora	Large-flowered polygala				+	+		
Polygala lutea	Orange milkwort		+					
Polygala rugelii	Yellow milkwort		+					
Polygala setacea	Coastal-plain milkwort		+					
Polygonella polygama v. polygama	Jointweed		+					
Polygonum densiflorum	Giant smartweed				+	+		
Polygonum hirsutum	Hairy smartweed				+	+		
Polygonum punctatum	Dotted smartweed		+					
Polypodium polypoidoides	Resurrection fern		+		+	+		
Polypremum procumbens	Rust weed		+		+	+		
Pontederia cordata	Pickerel weed		+	+	+	+	+	
Portulaca pilosa	Pink purslane				+	+		
Proserpinaca palustris	Mermaid weed		+		+	+		
Proserpinaca pectinata	Dissected mermaid weed				+	+		
Psidium guajave	Guava	Exotic			+		+	+
Psilotum nudum	Whisk fern		+					
Pteridium aquilinum v. latiusculum	Bracken fern		+					
Pterocaulon pycnostachyum	Coastal blackroot		+					
Pterocaulon virgatum	Blackroot				+	+		
Pteroglossasplis ecristate	Giant orchid	**Threaten(S) FNAI**	+					
Ptilimnium capillaceum	Mock bishop's weed		+		+	+		
Pyrrhopappus carolinianus	Carolina false dandelion		+					
Quercus chapmanii	Chapman's oak		+					

APPENDIX D: PLANTS OF THE LOWER REEDY CREEK MANAGEMENT AREA continued

Scientific Binomial	Common Name	Status	Management Unit					
			Lake Russ	Merritt Isl	Rough Isl-N	Rough Isl-S	Rough Isl-W	Johnson Isl
Quercus geminata	Sand/Scrub-live oak		+					
Quercus hemispherica	Upland laurel oak		+					
Quercus incana	Bluejack/Gray oak		+					
Quercus inopina	Scrub oak		+					
Quercus laevis	Turkey oak		+					
Quercus laurifolia	Laurel oak		+		+	+	+	
Quercus minima	Dwarf live oak		+					
Quercus myrtifolia	Myrtle oak		+					
Quercus nigra	Water oak		+				+	
Quercus virginiana	Live oak		+	+	+	+	+	
Rhexia mariana	Pale meadow beauty		+	+	+	+	+	
Rhexia nashii	Nash's meadow beauty		+					
Rhexia nuttallii	Nuttall's meadow beauty		+					
Rhexia petiolata	Ciliate meadow beauty		+					
Rhus copallina	Winged sumac		+		+	+		
Rhynchelytrum repens	Red natalgrass		+					
Rhynchospora caduca	Falling beakrush		+					
Rhynchospora ciliaris	Ciliate beakrush		+					
Rhynchospora corniculata	Horned rush		+					
Rhynchospora fascicularis	Soft beakrush		+		+	+		
Rhynchospora fernaldii	Fernald's beakrush		+					
Rhynchospora internedia	Pinebarren beakrush		+					
Rhynchospora inundata	Inundated beakrush		+		+	+		
Rhynchospora megalocarpa	Sandy-field beak sedge		+					
Rhynchospora microcarpa	Small-fruited beakrush				+	+		
Rhynchospora miliacea	Swamp beakrush		+		+	+		
Rhynchospora mixta	Mingles beakrush		+					
Rhynchospora odorata	Fragrant beakrush		+					
Rhynchospora plumosa	Plumed beakrush		+					
Rhynchospora sp.	Beakrush			+		+	+	
Richardia brasiliensis	Tropical Mexican clover		+					
Richardia scabra	Rough diamond-flower				+	+		
Rubrus trivialis	Southern dewberry				+	+		
Rubus betulifolius	Blackberry		+				+	
Rumex hastatulus	Hastate-leaved dock		+					
Sabal minor	Dwarf palmetto		+					
Sabal palmetto	Cabbage palm		+		+	+	+	
Sabatia brevifolia	Creeping bluestem		+					
Sabatia grandiflora	Large marsh pink					+		
Saccharum giganteum	Sugarcane plumegrass		+					
Sacciolepis indica	Indian cupscale grass	**Exotic**	+		+	+		
Sacciolepis striata	American cupscale		+					
Sagittaria lancifolia	Lance leaf arrowhead			+	+	+	+	

APPENDIX D: PLANTS OF THE LOWER REEDY CREEK MANAGEMENT AREA continued

Scientific Binomial	Common Name	Status	Management Unit					
			Lake Russ	Merritt Isl	Rough Isl-N	Rough Isl-S	Rough Isl-W	Johnson Isl
Sagittaria latifolia	Common arrowhead				+	+		
Sagittaria subulata v. stagnorum	Dwarf arrowhead				+	+		
Salix caroliniana	Coastal plain willow				+	+	+	
Sambucus canadensis	Elderberry		+		+	+		
Sapium sebiferum	Chinese tallow tree	**Exotic**			+	+		
Saururus cernuus	Lizard tail		+	+	+	+	+	
Schinus terebinthifolius	Brazilian pepper	**Exotic**			+	+		+
Schizachyrium stoloniferum	Creeping bluestem		+					
Scirpus californicus	Bulrush						+	
Scirpus cubensis	Cuban bulrush						+	
Scirpus validus	Soft bulrush				+	+		
Scleria pauciflora	Few-flower nutrush		+					
Scleria reticularis	Netted nutrush		+					
Scleria triglomerata	Tall nutgrass		+					
Scoparia dulcis	Sweetbroom		+		+	+		
Serenoa repens	Saw palmetto		+		+	+		
Sesbania emerus	Hemp sesbania				+	+	+	
Sesbania punicea	Red-flowered sesbania	Exotic			+	+		
Seymeria pectinata	Piedmont seymeria		+					
Sida rhombifolia	Indian hemp					+		
Sisyrinchium atlanticum	Blue-eyed grass				+	+		
Smilax auriculata	Sweetbriar		+		+	+		
Smilax bona-nox	Greenbrier		+		+	+		
Smilax laurifolia	Catbrier				+	+		
Smilax smallii	Lance-leaf greenbrier		+					
Smilax walteri	Red-berry greenbrier		+					
Solanum americanum	Common nightshade				+	+		
Solanum torvum	Turkeyberry	**Exotic**			+			
Solanum viarum	Tropical soda apple	**Exotic**			+	+		+
Solidago fistulosa	Goldenrod		+		+	+		
Solidago odora v. chapmanii	Sweet goldenrod		+					
Solidago sempervirens	Goldenrod				+	+		
Sonchus oleraceus	Common sow thistle				+	+		
Sorghastrum secundum	Lopsided indiangrass		+					
Spartina bakeri	Sand cordgrass			+	+	+	+	
Sphagnum spp.	Sphagnum moss		+					
Stillingia sylvatica	Upland queen's delight		+					
Stipulicida setacea v. lacerata	Pineland scaly-pink		+					
Syngonanthus flavidulus	Yellow hatpins		+					
Taxodium ascendens	Pond cypress		+				+	
Taxodium distichum	Bald cypress		+	+	+	+	+	
Tephrosia hispidula	Spreading hoary-pea		+					
Teucrium canadense v. hypoleucum	Wood sage				+	+		
Thalia geniculata	Alligator flag		+		+	+		

APPENDIX D: PLANTS OF THE LOWER REEDY CREEK MANAGEMENT AREA continued

Scientific Binomial	Common Name	Status	Management Unit					
			Lake Russ	Merritt Isl	Rough Isl-N	Rough Isl-S	Rough Isl-W	Johnson Isl
Thelypteris augescens	Cypress shield fern	**Threaten (S)**			+	+		
Thelypteris interrupta	Shield fern		+		+	+		
Tillandsia bartramii	Wild pine		+					
Tillandsia fasciculata	Stiff-leaved wild pine	**Endanger (S)**	+		+	+		
Tillandsia recurvata	Ball moss		+		+	+		
Tillandsia setacea	Needle-leaved wild pine		+		+	+		
Tillandsia simulata	Wild pine		+					
Tillandsia usneoides	Spanish moss		+		+	+		
Tillandsia utriculata	Giant wild pine	**Endanger (S)**	+		+	+	+	
Toxicodendron radicans	Poisen ivy		+					
Typha latifolia	Common cattail				+	+	+	
Ulmus americana	American elm		+				+	
Urena lobata	Caesar weed	**Exotic**	+		+	+	+	+
Utricularia subulata	Zigzag bladderwort		+					
Vaccinium corymbosum	Highbush		+					
Vaccinium myrsinites	Shiney blueberry		+					
Vaccinium stamineum	Deerberry		+					
Verbesina virginica	Frostweed				+	+		
Viola lanceolata	Long-leaved violet		+			+		
Vitis munsoniana	Grapevine						+	
Vitis rotundifolia	Fox grape		+		+	+		
Vitis shuttleworthii	Calusa grape				+	+		
Vittaria lineata	Shoestring fern		+		+	+		
Woodwardia areolata	Netted chain fern		+	+			+	
Woodwardia virginiana	Chain fern		+		+	+		
Ximenia americana	Hog plum				+	+		
Xyris brevifolia	Short-leaf yellow-eyed grass		+					
Xyris caroliniana	Carolina yellow-eyed grass		+					
Xyris elliottii	Elliott's yellow-eyed grass		+					
Xyris jupicai	Common yellow-eyed grass		+		+	+		
Xyris platylepsis	Twisted yellow-eyed grass		+		+	+		

APPENDIX E: BIRDS OF THE LOWER REEDY CREEK MANAGEMENT AREA

Endangered (**F**ed/**S**tate)
Species of Special **Concern** (**S**tate)

Threatened (**F**ed/**S**tate)
FNAI listed species

Data source: FNAI, TNC, FWC, Hilsenbeck, Bridges & Reese, and LSP Resource Evaluation Program

Scientific Binomial	Common Name	Status	Management Unit					
			Lake Russ	Merritt Isl	Rough Isl-N	Rough Isl-S	Rough Isl-W	Johnson Isl
Accipiter cooperi	Cooper's hawk	FNAI			+			
Accipter striatus	Sharp-shinned hawk				+			
Actitis macularia	Spotted sandpiper				+			
Agelaius phoeniceus	Red-winged blackbird			+	+		+	
Aix sponsa	Wood duck			+	+		+	
Anas discors	Blue-winged teal				+			
Anas fulvigula	Mottled duck				+			
Anas rubripes	Black duck				+			
Anhinga anhinga	Anhinga				+		+	
Aphelocoma coerulescens	Florida scrub jay	Threaten(F/S) FNAI			+			
Aramus guarauna	Limpkin	Concern(S) FNAI			+			+
Ardea herodius	Great blue heron			+	+		+	
Aythya affinis	Lesser scaup				+			
Aythya tollaris	Ring-necked duck				+			
Botaurus lentiginosus	American bittern				+			
Bubo virginianus	Great horned owl				+			
Bulbucus ibis	Cattle egret			+	+		+	
Buteo jamaicensis	Red-tailed hawk			+	+		+	
Buteo lineatus	Red-shouldered hawk			+	+		+	
Buteo platypterus	Broad-winged hawk				+			
Butorides virescens	Green heron				+			
Caprimulgus carolinensis	Chuck-will's-widow			+	+		+	
Caracara plancus	Crested caracara	Threaten(F/S) FNAI			+			
Cardinalis cardinalis	Northern cardinal			+	+		+	
Carduelis tristis	American goldfinch			+			+	
Casmerodius albus	Great egret	FNAI			+			
Cathartes aura	Turkey vulture			+	+		+	
Ceryle alcyon	Belted kingfisher				+			
Charadrius vociferus	Killdeer				+			
Chordeiles minor	Common nighthawk				+			
Circus cyaneus	Marsh hawk				+			
Coccyzus americanus	Yellow-billed cuckoo			+	+		+	
Colaptes auratus	Northern flicker				+			
Colinus virginianus	Bobwhite quail			+	+		+	
Columbina passerina	Common ground dove				+		+	
Contopus virens	Eastern wood-pewee				+			
Coragyps atratus	Black vulture			+	+		+	

APPENDIX E: BIRDS OF THE LOWER REEDY CREEK MANAGEMENT AREA continued

Scientific Binomial	Common Name	Status	Management Unit					
			Lake Russ	Merritt Isl	Rough Isl-N	Rough Isl-S	Rough Isl-W	Johnson Isl
Corvus brachyrhynchos	American crow				+			
Corvus ossifragus	Fish crow			+			+	
Cyanocitta cristata	Blue jay			+	+		+	
Dendroica caerulescens	Black-throated blue warbler				+			
Dendroica coronota	Yellow-rumped warbler			+			+	
Dendroica discolor	Prairie warbler				+			
Dendroica dominica	Yellow-throated warbler				+			
Dendroica palmarum	Palm warbler			+	+		+	
Dendroica pinus	Pine warbler			+	+		+	
Dryocopus pileatus	Pileated woodpecker			+	+		+	
Dumetella carolinensis	Gray catbird			+	+		+	
Egretta caerula	Little blue heron	Concern(S) FNAI		+	+		+	
Egretta thula	Snowy egret	Concern(S) FNAI			+			
Egretta tricolor	Tricolor heron	Concern(S) FNAI			+			
Elanoides forficatus	Swallow-tailed kite	FNAI		+	+		+	
Eudocimus albus	White ibis	Concern(S) FNAI			+			
Falco sparverius	American kestrel	Threaten (S)			+			+
Fulica americana	American coot				+			
Gallinago gallinago	Common snipe				+			+
Gallinula chloropus	Common moorhen				+			
Geothlypis trichas	Common yellowthroat			+	+		+	
Grus Americana	Whooping crane	Concern (S)						+
Grus canadensis pratensis	Florida sandhill crane	Threaten(S) FNAI			+			+
Haliaeetus leucocephalus	Bald eagle	Threaten(F/S) FNAI		+	+	+	+	+
Himantopus mexicanus	Black-necked stilt				+			
Lanius ludovicianus	Loggerhead shrike				+			
Larus delawarensis	Ring-billed gull				+			
Melanerpes carolinus	Red-bellied woodpecker			+	+		+	
Meleagris gallopavo	Turkey		+	+	+		+	+
Mimus polyglottis	Northern Mockingbird			+	+		+	
Mniotilta varia	Black-and-white warbler				+			
Mycteria americana	Wood stork	Endanger(F/S) FNAI		+	+		+	
Myiarchus crinitus	Great-crested flycatcher			+	+		+	
Otus asio	Eastern screech-owl				+			
Pandion haliaetus	Osprey	FNAI	+	+	+		+	
Parula americana	Northern parula			+	+		+	
Parus bicolor	Tufted titmouse			+	+		+	
Phalacrocorax auritus	Double-crested cormorant				+			
Picoides pubescens	Downy woodpecker			+	+		+	
Picoides villosus	Hairy woodpecker	FNAI			+			
Pipilo erythrophthalmus	Rufous-sided towhee			+	+		+	
Piranga rubra	Summer tanager			+	+		+	
Plegadis falcinellus	Glossy ibis	FNAI			+			

APPENDIX E: BIRDS OF THE LOWER REEDY CREEK MANAGEMENT AREA continued

Scientific Binomial	Common Name	Status	Management Unit					
			Lake Russ	Merritt Isl	Rough Isl-N	Rough Isl-S	Rough Isl-W	Johnson Isl
Podilymbus podiceps	Pied-billed grebe				+			
Polioptila caerulea	Blue-gray gnatcatcher			+	+		+	
Porphyrula martinica	Purple gallinule				+			
Progne subis	Purple martin				+			
Quiscalus major	Boat-tailed grackle			+	+		+	
Quiscalus quiscula	Common grackle				+			
Regulus calendula	Ruby-crowned kinglet			+			+	
Rostrhamus sociabilis	Everglades kite	Endanger(F/S) FNAI			+			
Sayornis phoebe	Eastern phoebe			+	+		+	
Seiurus noveboracensis	Northern waterthrush				+			
Seiurus motacilla	Louisiana waterthrush	FNAI			+			
Setophaga ruticilla	American redstart	FNAI			+			
Sialia sialis	Eastern bluebird				+			
Sphyrapicus varius	Yellow-bellied sapsucker			+			+	
Sterna forsteri	Forster's tern				+			
Strix varia	Barred owl			+	+		+	
Sturnella magna	Eastern meadowlark				+			+
Tachycineta bicolor	Tree swallow			+	+		+	+
Thryothorus ludovicianus	Carolina wren			+	+		+	
Toxostoma rufum	Brown thrasher			+	+		+	
Tringa flavipes	Lesser yellowlegs				+			
Tringa melanoleuca	Greater yellowlegs				+			
Turdus migratorius	American robin			+	+		+	
Tyrannus tyrannus	Eastern kingbird				+			
Tyto alba	Common barn owl				+			+
Vireo flavifrons	Yellow-throated vireo				+			
Vireo griseus	White-eyed vireo			+	+		+	
Vireo olivaceus	Red-eyed vireo			+	+		+	
Vireo solitarius	Solitary vireo				+			
Zenaida macroura	Mourning dove			+	+		+	

APPENDIX F: MAMMALS OF THE LOWER REEDY CREEK MANAGEMENT AREA

Endangered (**F**ed/**S**tate) **Threaten**ed (**F**ed/**S**tate)
Species of Special **Concern** (**S**tate) **FNAI** listed species

Data source: FNAI, TNC, FWC, Hilsenbeck, Bridges & Reese, and LSP Resource Evaluation Program

Scientific Binomial	Common Name	Status	Management Unit					
			Lake Russ	Merritt Isl	Rough Isl-N	Rough Isl-S	Rough Isl-W	Johnson Isl
Canis latrans	Coyote							+
Corynorhinus rafinesquii	Southeastern big-eared bat	**FNAI**	+	+	+		+	
Dasypus novemcinctus	Nine-banded armadillo	**Exotic**	+	+	+		+	+
Lutra canadenis	River Otter							+
Lynx rufus	Bobcat			+			+	+
Odocoileus verginianus	White-tailed Deer		+	+	+		+	+
Procyon lotor	Racoon			+	+		+	+
Scalopus aquatica	Eastern mole			+			+	
Sciurus caroliana	Southern gray squirrel			+			+	
Sciurus niger shermani	Sherman's Fox Squirrel	**Concern(S) FNAI**		+			+	+
Sus scrofa	Feral Hog	**Exotic**		+	+		+	+
Sylvilagus palustris	Marsh rabbit			+			+	

APPENDIX G: AMPHIBIANS AND REPTILES OF THE LOWER REEDY CREEK MANAGEMENT AREA

Endangered (**F**ed/**S**tate)
Species of Special **Concern** (**S**tate)
Threatened (**F**ed/**S**tate)
FNAI listed species

Data source: FNAI, TNC, FWC, Hilsenbeck, Bridges & Reese, and LSP Resource Evaluation Program

Scientific Binomial	Common Name	Status	Management Unit					
			Lake Russ	Merritt Isl	Rough Isl-N	Rough Isl-S	Rough Isl-W	Johnson Isl
Alligator mississippiensis	American alligator	ThreatF) Concern(S)			+	+	+	+
Acris gryllus	Southern cricket frog			+			+	
Anolis caroliniana	Green anole			+			+	
Bufo terrestris	Southern common toad			+			+	
Cnemidophorus sexlineatus	Six-lined race runner			+			+	
Coluber constictor	Southern black racer			+			+	
Elaphe obsoleta quadrovittata	Yellow rat snake						+	
Eleutherodactylus planirostris	Greenhouse frog			+			+	
Eumeces laticeps	Broad-headed skink			+			+	
Gopherus polyphemus	Gopher tortoise	Concern(S) FNAI	+	+			+	
Heterodon platyrhinos	Eastern hog-nosed snake			+			+	
Hyla femoralis	Pinewoods tree frog			+			+	
Hyla gratiosa	Barking tree frog			+			+	
Hyla squirrella	Squirrel tree frog			+			+	
Kinosternon bauri	Striped mud turtle			+			+	
Pseudacris cinerea	Green tree frog			+			+	
Pseudacris crucifer	Spring peepers			+			+	
Scincilla lateralis	Ground skink			+			+	
Sternotherus odorata	Musk turtle			+			+	
Terrapene carolina	Florida box turtle			+			+	

Appendix H: Suitability of Land Use Matrix for the Lower Reedy Creek Management Area

Potential Use	High Resource Vulnerability	Moderate Resource Vulnerability	Limited Resource Vulnerability	Minimal Resource Vulnerability
Hiking / Wilderness	with restrictions, monitor and restrict number and length of season	restrict number, monitor and restrict number and length of season	yes	yes
Hiking / Seasonal	with restrictions, monitor and restrict number and length of season	restrict number, monitor and restrict number and length of season	yes	yes
Primitive Camping	with restrictions, monitor and restrict number and length of season	with restrictions, monitor and restrict number and length of season	yes	yes
Bank Fishing	with restrictions, monitor and restrict number and length of season	with restrictions, monitor and restrict number and length of season	yes	yes
Bird Watching / Passive	with restrictions, monitor and restrict number	with restrictions, monitor and restrict number	yes	yes
Bird Blinds	no	with restrictions, depends on specific on site	yes	yes
Canoeing	limit access and number	limit access and number	yes	yes
Picnicking with Facilities	no	no	yes	yes
Picnicking without Facilities	with restrictions, monitor and restrict number and length of season	with restrictions, monitor and restrict number and length of season	yes	yes
Boardwalks	with restrictions, locations to be dependent on drainage and potential water levels and channel conveyance and impedance	with restrictions, locations to be dependent on drainage and potential water levels and channel conveyance and impedance	yes	yes
Seasonal, Unpaved Vehicular Access	no	no	no	no

Appendix H: Suitability of Land Use Matrix (continued)

Potential Use	High Resource Vulnerability	Moderate Resource Vulnerability	Limited Resource Vulnerability	Minimal Resource Vulnerability
Restrooms	no	no	no	yes
Camp Fire	no	no	yes	yes
Fire Pits	no	no	no	yes
Air Boating	no	no	yes	yes
Motor Boating	with restrictions, monitor and restrict number and length of season	with restrictions, monitor and restrict number and length of season	yes	yes
Boat ramps – Structured	no	no	no	no
Boat Ramps – Grade Launches	no	no	no	no
Parking	no	no	no	with restrictions, restrictions are site specific
Buildings (e.g. Visitors)	no	no	no	yes
Equestrian Trails	no	no	with restrictions, restrictions are determined by site specific locations	yes
Bicycle Trails	no	no	yes	yes
ATV Vehicles	no	no	no	no
Airstrip	no	no	no	no
Paved Access	no	no	no	with restrictions, restrictions are determined by site specific locations

Appendix I: Kissimmee Chain of Lakes Land Management Advisory Committee – Management Goals & Policy Recommendations

Final Report by the
Kissimmee Chain of Lakes Land Management Advisory Committee
(September 1996)

Recommended Policies for Land Management Units (within the Upper Kissimmee River - Kissimmee Chain of Lakes Project Acquisition Area) included within the Lower Reedy Creek Management Area:

- Rough Island Management Unit
- Johnson Island Management Unit

Vision Statement

We envision the Kissimmee Chain of Lakes as a viable ecosystem held in trust for future generations, to be managed in an ecologically sustainable, long-term manner for the benefit of multiple users. The management of these lands shall be done through a variety of public-private partnerships to best contribute to the downstream restoration of the Kissimmee River and the Everglades. These lands shall be used to advance scientific knowledge and public understanding of Florida's ecosystems while allowing the public to enjoy these lands to the maximum extent feasible.

Purpose of this Document

The purpose of this document is to provide for the management of the lands and waters of the Upper Kissimmee Chain of Lakes so as to be compatible with the reestablishment of natural water flows to the Kissimmee River and optimize lake level fluctuations for the enhancement of fish and wildlife habitats while allowing for public uses when and where feasible. All policies and goals suggested herein should support and be compatible with this purpose.

Goals

1. Support and enhance the natural systems.
2. Provide special management considerations for rare or listed species and critical wildlife functions.
3. Provide opportunities for public use where appropriate.
4. Derive appropriate economic benefits from the land.
5. Provide for cost effective management of the lands.
6. Provide reasonable and affordable security for the lands.
7. Identify appropriate management uses for distinct management areas.
8. Encourage coordinated interagency management of these lands.
9. Provide for protection and maintenance of significant historical and cultural resources.
10. Implement adaptive management practices on these lands.
11. Provide flood protection.
12. Provide a forum for ongoing stakeholder involvement.

Policies to achieve the Mission & Goals

Goal #1 To support the restoration and/or protection of natural systems

- Policy #1 A master plan for natural resource management should be developed.
- Policy #2 No policies may be established which result in significant destruction or harm to the natural ecological and hydrological systems of these lands.
- Policy #3 Levees and other structures, which block natural water flows, should be removed or brought to natural grade to the extent feasible.
- Policy #4 Control burning shall be used as a management tool to restore and maintain lands.
- Policy #5 Control of exotic plants and animals on these lands and marshes must be practiced.
- Policy #6 Management programs should replicate natural systems and patterns to the extent possible.
- Policy #7 Establish specific vegetation goals and monitor the progress toward those goals as required in the upper and lower basins. Regulatory actions should be consistent with the support and restoration and protection of natural systems.

Goal #2 To provide special management considerations for rare or listed species and critical wildlife functions

- Policy # 8 Sites that are identified as critical wildlife habitats shall be protected. Sites that are identified as intensive breeding, roosting or feeding sites shall be protected.
- Policy # 9 Public use may be limited from time to time or place to place as needed to protect areas that have been identified as critical wildlife habitat.

Goal #3 To provide opportunities for appropriate public use

- Policy # 10 Access to these lands may be restricted as needed and appropriate to meet the goals for these lands.
- Policy # 11 Buffer areas should be established between incompatible uses.
- Policy # 12 A master plan for public use shall be developed.
- Policy # 13 The master plan shall allow for use of these lands as part of a recreational trail system, when such use is consistent with the goals of this plan.
- Policy # 14 Public information/education programs of the appropriate nature should be offered at points of public access. Appropriate signage should be provided to facilitate public use and identify restricted areas.

Policy # 15 Appropriate public uses shall be encouraged and facilitated to the extent they do not conflict with other policies and to the extent such use is economically feasible to provide. Where public uses are incompatible, appropriate sites will be provided to minimize conflict. Public uses may be restricted to certain areas or trails based on environmental criteria, wildlife protection criteria, or incompatible use criteria.

Policy # 16 To minimize environmental impact, the following practices should be considered:

- Limit human use in pristine areas.
- Rotate human use where feasible.
- Concentrate high impact uses in already disturbed areas
- Horseback riding should be restricted to designated staging areas, trails, and other appropriate areas.
- Based on natural resource criteria and public use criteria, airboat use may be restricted to designated trails or denied access to certain areas.
- Public hunting should be allowed based on an evaluation of the huntable resources by the state wildlife management agencies and the impact of hunting on the natural resources

Policy # 17 Private sector provision of appropriate public uses will be encouraged.

Policy # 18 Improved, controlled access for public entry should be provided at appropriate and feasible points.

Goal # 4 To derive appropriate economic benefits from the land

Policy # 19 Grazing leases should be encouraged where compatible with environmental values and of economic benefit to both parties.

Policy # 20 Private-public partnerships should be encouraged to facilitate public use of renewable resources.

Policy # 21 The District may authorize concessionaires to sell appropriate materials at a concession stand.

Policy # 22 User fees that distinguish among various recreational uses and between recreational and commercial activities may be charged in whatever appropriate form.

Policy # 23 The District is encouraged to seek sponsors for informational material to provide offsetting expenses or develop recurring revenue.

Policy # 24 The District may use where feasible an honor system donation process to cover the cost of basic information materials.

Policy # 25 Federal and other grant revenues should be sought.

Policy # 26 Eco-tourism opportunities should be encouraged to boost local economies and public education as long as such uses will not over extend land use.

Goal #5 To provide for cost effective management of the lands

Policy # 27 Having user fees may be appropriate and, if adopted, should be set at reasonable levels to pay for the costs of management and security. These fees will be reinvested back into the land management.

Policy # 28 These lands should be available for off-site mitigation where restoration or enhancement needs dictate.

Policy # 29 Encourage cooperative management relationships that would operate under the rules and policies adopted by the District.

Policy # 30 Additional operation and maintenance costs that accrue from special public uses of existing internal agency service facilities should be paid for by the user groups utilizing those facilities.

Policy # 31 Properly designed volunteer programs or use of Department of Corrections labor sources should be encouraged.

Policy # 32 Public use areas should be designed for low maintenance and operations cost.

Policy # 33 The Land Manager should experiment with differing trash management approaches to determine which are most cost effective.

Policy # 34 Developed day-use areas may be managed by concessionaires.

Goal #6 To provide reasonable and affordable security for the lands

Policy # 34 Sites should be available as residences for law enforcement or security personnel, where feasible.

Policy # 35 Security requirements should be higher at certain sites where security services are not currently provided.

Policy # 36 Access to designated lands may require stamps or permits.

Goal #7 To delineate distinct management units and land uses

Policy # 38 The following areas will serve as the management areas and units for the project:

- East Shore Management Unit
- Gardner Marsh Management Unit
- Rough Island Management Unit
- Johnson Island Management Unit
- Lake Marion Creek Management Area [includes London Creek]
- Catfish Creek Management Area [includes areas adjacent to Kissimmee State Park]
- Lightsey Management Unit [includes Tiger Creek, West shore, Southwest shore]
- Kissimmee Islands Management Unit
- Lake Cypress Management Unit

Policy # 39 The following use classifications will be adopted:

- Natural Resource Management
- Preservation [no human uses]
- Recreation
  - Hiking/Nature
  - Picnic -Day use [intensive]
  - Camping
  - Bicycling
  - Horse Riding
  - Canoeing
  - Non-Motor Boating
  - Motor Boating
  - Airboating
  - Off-Road Vehicle Use
  - Hunting
  - Fishing
  - Vehicular Access
  - Boat Access/Docks
  - Nature Center
  - Interpretive trail
  - Eco-tourism
- Other Activities
  - Grazing Lease
  - Mitigation Bank
  - Outfitters/Concession
  - Airboat Concession

Policy # 40 Incompatible uses will be identified on a management area/unit basis, based on the needs and sensitivities of that area.

Policy # 41 All public uses will be permitted unless restricted by current or future District policies, by the rules and regulations of the Management Area Manager, or by the recommended policies of this document as finally adopted. Such permission acknowledges that some allowed uses might not be currently feasible or ever feasible.

Policy # 42 Public use of Gardner Marsh shall be proposed [l] by a natural resource technical group which will determine when and if restrictions are needed for natural resource reasons and [2] by a multi-stakeholder body which will resolve conflicting public uses. Public access, by land or water, shall be at designated access points.

Policy # 43 Airboats will have access to Gardner Marsh in accordance with District rules, with the exception of bird rookeries, and other critical wildlife habitat areas identified and posted during the upcoming study until the study is complete and findings accepted.

Policy # 44 Restriction of any public uses, may be recommended on a permanent or temporary basis to the District or appropriate Management Area Manager, by a Technical Advisory Committee or the Stakeholder

Committee based on environmental considerations, public use conflicts, financial considerations or other consideration the Committee deems appropriate. Recommendations from either Committee will be submitted to the other Committee for review and comment prior to formal action by whatever the appropriate body.

Goal #8 To encourage coordinated interagency management of these lands

Policy # 45 District lands adjacent to preserves should be managed in a manner which is compatible with those preserves.

Policy # 46 Management of these lands will coordinate as needed with aquatic weed control activities in the lakes.

Policy # 47 A resource management partnership will be established of stakeholders for planning and policy development for overall systems management. It may establish such sub-committees as needed.

Policy # 48 Management of these properties will be coordinated with in-lake management policies, programs and activities, (i.e. operation of watercraft, hunting, fishing and other water-oriented recreation and lake management activities).

Goal #9 To provide for protection and maintenance of significant historical and cultural resources

Policy # 49 Areas of historic or cultural significance will be protected and may result in limited public use.

Policy # 50 Areas of particular historic or cultural significance will be so designated. The following areas are designated at this time:

- East shore Indian mound
- Rough Island Indian mound

Policy # 51 Historic or cultural aspects of the property should be included in public education programs

Goal #10 To improve our knowledge of how to effectively manage natural systems

Policy # 52 A base inventory of natural systems shall be conducted and periodically updated to determine appropriate use areas.

Policy # 53 These lands shall be used to further scientific knowledge about ecosystem management.

Policy # 54 The management program shall contribute to the statewide database on natural areas and conform to adopted data conventions for that data.

Policy # 55 A plan shall be established to monitor impacts from recommendations for closing or rotating areas of use that exhibit areas of degradation. This plan should ensure there is ongoing feedback to monitor the results of management decisions and modify decisions as appropriate.

Goal #11 Provide Flood Protection

Policy # 56 The integrity of the Central and South Florida flood control system must be maintained.

Goal #12 Provide a forum for on-going stakeholder involvement

Policy # 57 Given the dynamic nature of these lands and evolving public needs and uses, an ongoing stakeholder group shall be established to:
[1] Make updated recommendations as to land management policies;
[2] Resolve or recommend resolutions for user group conflicts;
[3] Advocate for proper public and private investments.
This group shall meet at least annually in synchronization with the District's rule making process.

Policy # 58 Should the Management Area Managers establish a Technical Committee to assist them in land management decisions, such Committee will operate in concert and communication with the proposed Stakeholder Committee so that the Stakeholder Committee shall have the opportunity to review and comment as well as substantively discuss with the Technical Committee any findings, conclusions, or recommendations. The Stakeholder Committee shall offer such reciprocal communication to the Technical Committee.

Appendix J: FY2001 Budget – Work Plan for the Lower Reedy Creek Management Area

BUDGET YEAR:		MANAGEMENT AREA: Lower Reedy Creek Management Area	Affected		
		Definitions of Category Activities	Miles	Acres	Budget
Resource Preservation / Acquisition		Preacquisition property inspections and management appraisals			
		5-Year acquisition planning and acquisition negotiation			
Management Evaluation					
Inventories		Initial baseline inventories of natural or cultural resources			
Monitoring		Periodic follow up surveys of natural resources			
Research		Specifically applied hypothesis testing on natural resources			
Management Review		Legislative-mandated reviews			
Resource Management					
Agriculture Mgmt		Crop production			
Arch, Hist, Cult. Resource Mgmt		Protection, planning, coordination of arch/hist/cultural resources			
Fire Mgmt		Activities in which the primary objective concerns fire or fuel loads			
	Prescribed Fire	Training, planning, site prep, and application of prescribed fire			
	Wildfire Suppression/Control	Coordination, planning, prevention, and extinguishing wildfires			
Forestry Mgmt		Timber planting, production and/or harvesting activities			
Hydrologic Mgmt		Wetland creation, restoration, or enhancement act. (incl. Mitigation)			
Range Mgmt		Livestock and pasture mgmt activities			
Soil & Mineral Mgmt		Soil mapping, erosion control, drilling/mining coordination			
Veg. Mgmt		Activities in which the primary objective is the			
		manipulation of vegetation			
	T & E Species	Primary objective is the protection and/or propagation			
		of listed plant species			
	Nuisance & Exotics	Chemical, mechanical, & biological control of plant species			
		(includes mowing, chopping, spraying, cutting)			
Wildlife/Habitat Mgmt		Activities in which the primary objective is the manipulation of wildlife			
	T & E Species (Non-game)	Primary objective is the protection and/or propagation of			
		listed and nonhunted animal species			
	Game Mgmt	Primary objective is the protection and/or propagation of			
		game (hunted) animal species			
	Pest Mgmt	Measures taken to eradicate nuisance & exotic animal species			
Human-Related Activities					
Resource Protection		Law enforcement, security, and incident coordination/resolution			
	Patrolling	Law enforcement patrols, coordinating, contracting			
	Delineation / Fencing / Posting	Activities aimed at identifying the boundaries of mgmt areas in the field			
Natural Resource-Based Public Use					
	Public Use Regulation	Review, modification, and creation of laws, regs, and policies (PUG)			
	Public Use Programs & EE	Development/implementation of any recreation and education activities			
Infrastructure Mgmt		Road, trail, access, and building development & maintenance			
Special Management Considerations		Any significant Area-specific activities			
		(incl. Real Property Mgt, Revenue Generation & Other Activities)			
Administration					
Budgeting		Budget preperation for personnel, equipment, & supplies			
Planning		CMP, OMP, and AWP activity			
Reporting		Quarterly and Annual Reporting activities			
Equipment & Supplies		Acquisition, maintenance, & repair			
External Entity Coordination/Contract		Acitivities that involve the coordination with outside agencies/			
		organizations which do not fall in any other activity category			
		(e.g. Tibet Butler - Orange County Admin,			
		6-Mile Cypress - Lee County Admin)			
		TOTAL	0.0	0.0	$0

Appendix J: FY2001 Budget - Work Plan for the Lower Reedy Creek Management Area (continued)

BUDGET YEAR:		MANAGEMENT AREA:	Affected		
FY 2001		Lower Reedy Ck M. A . (A03, 04, 07, 09) 204 Funds	Miles	Acres	Budget
Resource Preservation / Acquisition		Approximate project acres not acquired		4,249	
Management Evaluation					
Inventories		Coordinate archeological inventories		6,840	
		Close-out flora/fauna inventory & review findings			
Monitoring		Develop Inclusive Monitoring Plan w/KRR			
		Cont. to monitor eagles, wood storks & bats			
Research		Close-out bat study & review findings: C-7338-A03			
		Gather FWC data on whooping cranes & cara caras		6,842	
		Implement public use/airboat research (5319)			$20,000
Management Review					
Resource Management					
Agriculture Mgmt		n/a			
Arch, Hist, Cult. Resource Mgmt		Establish protection as per inventory			
Fire Mgmt		n/a			
	Prescribed Fire	Implement 4 DOF-assisted burns at JI & LR (5312)		400	$1,500
	Wildfire Suppression/Control	Maintain fire lines	5.00		
		Arrange site visits with local fire station		2,200	
Forestry Mgmt		n/a			
Hydrologic Mgmt		Coordinate GOAA off-site mitigation: #48-00063-S		600	
		Oversee implementation of JI enhancement contract		1,700	
		Determine enhancement possibilities at RI & JI		3,400	
Range Mgmt		Coordinate development of Range Mgmt. Plans JI/RI		6,840	
		Implement grazing lease on Johnson Island		1,700	
		Oversee RI grazing lease: C-3239		1,733	
		Oversee RI grazing reservation: Southport- no #		690	
Soil & Mineral Mgmt		n/a			
Veg. Mgmt					
	T & E Species				
	Nuisance & Exotics	Ft. Meyers Exotics Budget (5319); 2 weeks		2,400	$20,000
		Contractor spraying at RI			
		Staff followup spraying - Chemicals (5535-5404)	2.00	100	$500
		TSA, BP, Guava			
Wildlife/Habitat Mgmt					
	T & E Species (Non-game)	Post around eagle nests & wood storks (5535-5421)	2.00	100	$1,000
	Game Mgmt				
	Pest Mgmt	Coordinate hog trapping by USDA on JI & RI		6,840	
Human-Related Activities					
Resource Protection					
	Patrolling	Coordinate FWC patrols: C-10162 (5391)			
	Delineation / Fencing / Posting	Mow fence lines and water boundaries	10.00	6,840	
		Maintain all fencelines and signs 2x/year (5535-5421)			$1,000
Natural Resource-Based Public Use		Establish access points & kiosks (5535-5422)		1	$3,000
	Public Use Regulation				
	Public Use Programs & EE	Coordinate Osceola Co/Lk Russell mgt: C-7947		492	
		Develop brochure (5343)			$500
Infrastructure Mgmt		CAP IMP (5319): road improvement at LR	1.00	492	$250,000
		Mow & maint. roads/culverts at JI & RI (5503, 5535)	5.00	4,100	$3,500
Special Management Considerations		Develop Cooperative Mgt Plan w/FDEP			
Administration					
Budgeting		Plan budget for FY02			
Planning		Complete Draft General Management Plan		7,462	
		Coordinate public review of GMP (5552)			$100
Reporting		Submit Q-reports			
Equipment & Supplies					
External Entity Coordination/Contract		211 BUDGET Ap03: ULB MGT (5319)		250	$7,500
		Oversee TNC mgt of Universal: C-7338-A01			
		Oversee TNC mgt of Park Equis: C-7338-A02		96	
		TOTAL	25.0	11,091.0	$308,600

Appendix J: FY2001 Budget - Work Plan for the Lower Reedy Creek Management Area (continued)

BUDGET YEAR:		MANAGEMENT AREA:	2000			2001								
FY 2001		Lower Reedy Ck M. A . (A03, 04, 07, 09) 204 Funds	O	N	D	J	F	M	A	M	J	J	A	S
Resource Preservation / Acquisition		Assist Real Estate Division w/ acquisitions	■	■	■	■	■	■	■	■	■	■	■	■
Management Evaluation														
Inventories		Coordinate archeological inventories	■	■										
		Close-out flora/fauna inventory & review findings		■	■									
Monitoring		Develop Inclusive Monitoring Plan w/KRR	■	■	■									
		Cont. to monitor eagles, wood storks & bats	■	■	■	■	■		■		■		■	
Research		Close-out bat study & review findings: C-7338-A03	■											
		Gather FWC data on whooping cranes & cara caras				■	■	■						
		Implement public use/airboat research (5319)	■	■	■	■							■	■
Management Review														
Resource Management														
Agriculture Mgmt		n/a												
Arch, Hist, Cult. Resource Mgmt		Establish protection as per inventory								■	■	■	■	■
Fire Mgmt		n/a												
	Prescribed Fire	Implement 4 DOF-assisted burns at JI & LR (5312)		■	■	■	■	■	■	■	■	■	■	■
	Wildfire Suppression/Control	Maintain fire lines	■	■	■	■	■	■	■	■	■	■	■	■
		Arrange site visits with local fire station							■	■				
Forestry Mgmt		n/a												
Hydrologic Mgmt		Coordinate GOAA off-site mitigation: #48-00063-S	■						■					
		Oversee implementation of JI enhancement contract	■	■	■	■	■	■						
		Determine enhancement possibilities at RI & JI							■	■	■			
Range Mgmt		Coordinate development of Range Mgmt. Plans JI/RI												
		Implement grazing lease on Johnson Island	■	■										
		Oversee RI grazing lease: C-3239			■							■		
		Oversee RI grazing reservation: Southport- no #				■							■	
Soil & Mineral Mgmt		n/a												
Veg. Mgmt														
	T & E Species													
	Nuisance & Exotics	Ft. Myers Exotics Budget (5319); 2 weeks					■	■	■					
		Contractor spraying at RI												
		Staff followup spraying - Chemicals (5535-5404)	■	■	■	■	■	■	■	■	■	■	■	■
		TSA, BP, Guava												
Wildlife/Habitat Mgmt														
	T & E Species (Non-game)	Post around eagle nests & wood storks (5535-5421)	■	■										
	Game Mgmt													
	Pest Mgmt	Coordinate hog trapping by USDA on JI & RI	■	■	■	■	■	■	■	■	■	■	■	■
Human-Related Activities														
Resource Protection														
	Patrolling	Coordinate FWC patrols: C-10162 (5391)	■	■	■	■	■	■	■	■	■	■	■	■
	Delineation / Fencing / Posting	Mow fence lines and water boundaries	■	■	■	■	■	■	■	■	■	■	■	■
		Maintain all fencelines and signs 2x/year (5535-5421)	■	■	■	■	■	■	■	■	■	■	■	■
Natural Resource-Based Public Use		Establish access points & kiosks (5535-5422)									■	■		
	Public Use Regulation													
	Public Use Programs & EE	Coordinate Osceola Co/Lk Russell mgt: C-7947			■						■			
		Develop brochure (5343)									■	■		
Infrastructure Mgmt		CAP IMP (5319): road improvement at LR	■	■	■	■	■	■	■	■	■	■	■	■
		Mow & maint. roads/culverts at JI & RI (5503, 5535)			■	■	■	■	■	■	■	■		
Special Management Considerations		Develop Cooperative Mgt Plan w/FDEP	■	■	■	■	■	■	■	■	■	■	■	■
Administration														
Budgeting		Plan budget for FY02						■	■					
Planning		Complete Draft General Management Plan	■	■										
		Coordinate public review of GMP (5552)		■	■									
Reporting		Submit Q-reports			■			■			■			■
Equipment & Supplies														
External Entity Coordination/Contract		211 BUDGET Ap03: ULB MGT (5319)	■	■										
		Oversee TNC mgt of Universal: C-7338-A01												
		Oversee TNC mgt of Park Equis: C-7338-A02	■	■										
			O	N	D	J	F	M	A	M	J	J	A	S

Appendix K: Legal Summary of Additional Protective Measures

258.501 (F.S.S.) Myakka River; wild and scenic segment.
(1) SHORT TITLE.--This section may be cited as the "Myakka River Wild and Scenic Designation and Preservation Act."
(2) LEGISLATIVE DECLARATION.--The Legislature finds and declares that a certain segment of the Myakka River in Manatee, Sarasota, and Charlotte Counties possesses outstandingly remarkable ecological, fish and wildlife, and recreational values which are unique in the State of Florida. These values give significance to the river as one which should be permanently preserved and enhanced for the citizens of the State of Florida, both present and future. The permanent management and administration of the river involves a complex interaction of state, regional, and local interests which require balancing and coordination of purpose. It is the intention of the Legislature to provide for the permanent preservation of the designated segment of the Myakka River by way of development of a plan for permanent administration by agencies of state and local government which will ensure the protection necessary but retain that degree of flexibility, responsiveness, and expertise which will accommodate all of the diverse interests involved in a manner best calculated to be in the public interest.
4) DESIGNATION OF WILD AND SCENIC RIVER.--
a) The corridor of land surrounding and beneath the Myakka River between river mile 7.5 and river mile 41.5 is hereby designated as a Florida wild and scenic river for the purposes of this section and is subject to all of the provisions of this section. Such designated portion is more particularly described as that portion of the Myakka River located between State Road 780 in Sarasota County and the Sarasota-Charlotte County line.
(15) PROHIBITED ACTIVITY.--Airboats are prohibited from operating in the river area north of U.S. Highway 41 (State Road 45), except for uses officially allowed by government agencies.

369.301 (F.S.S.) Short title. This part may be cited as the "Wekiva River Protection Act."

1369.311 Policy. The Legislature reaffirms the policy of the state as set forth in this part, with regard to the protection of the Wekiva River System, including, but not limited to, its tributaries. The Little Wekiva River, as a major tributary of the Wekiva River, plays an important role with regard to the protection and water quality of the Wekiva River. Accordingly, it is appropriate to take timely and prudent actions to protect, preserve, and restore the water quality and environmental integrity of the Little Wekiva River.

369.309 (F.S.S.) Airboats prohibited; exceptions; penalties. (1) The operation of an airboat on the Wekiva River System shall be prohibited. For the purposes of this section, an airboat is any boat, sled, skiff, or swamp vessel that is pushed, pulled, or propelled by air power generated by a nondetachable motor of more than 10 horsepower.

258.36 (F.S.S.) Legislative intent. It is the intent of the Legislature that the state-owned submerged lands in areas which have exceptional biological, aesthetic, and scientific value, as hereinafter described, be set aside

forever as aquatic preserves or sanctuaries for the benefit of future generations.

258.40 (F.S.S.) Scope of preserves. (1) The aquatic preserves established under this act shall include only lands or water bottoms owned by the state as set forth in s. 253.03 and such lands or water bottoms owned by other governmental agencies as may be specifically authorized for inclusion by appropriate instrument in writing from such agency. Any privately owned lands or water bottoms shall be deemed to be excluded there from; however, the board may negotiate an arrangement with any such private owner by which such land may be included in the preserves.

258.004 (F.S.S.) Duties of division. (1) It shall be the duty of the Division of Recreation and Parks of the Department of Environmental Protection to supervise, administer, regulate, and control the operation of all public parks, including all monuments, memorials, sites of historic interest and value, sites of archaeological interest and value owned, or which may be acquired, by the state, or to the operation, development, preservation, and maintenance of which the state may have made or may make contribution or appropriation of public funds. (2) The Division of Recreation and Parks shall preserve, manage, regulate, and protect all parks and recreational areas held by the state and may provide these services by contract or interagency agreement for any water management district when the governing board of a water management district designates or sets aside any park or recreation area within its boundaries.

258.017 (F.S.S.) Dedication of state park lands for public use.--The Division of Recreation and Parks is authorized and empowered, from time to time, by resolution, to dedicate and reserve for the use of the public all or any part of the lands acquired by the division for park purposes; provided however, that said dedication and reservation shall be subject to such rules and regulations, as to reasonable use by the public, as may be adopted by the division.

39-18.005 (F.A.C.) State Parks Established as Wildlife Refuges. All lands established and operated as State parks or recreation areas are established as wildlife refuges and no person shall take any wildlife on such areas unless specifically authorized by Commission regulation.

380.05 (F.S.S.) Areas of critical state concern. (1)(a) The state land planning agency may from time to time recommend to the Administration Commission specific areas of critical state concern. (c) A rule adopted by the commission pursuant to paragraph (b) designating an area of critical state concern and principles for guiding development shall be submitted to the President of the Senate and the Speaker of the House of Representatives for review no later than 30 days prior to the next regular session of the Legislature. (2) An area of critical state concern may be designated only for: (a) An area containing, or having a significant impact upon, environmental or natural resources of regional or statewide importance, including, but not limited to, state or federal parks, forests, wildlife refuges, wilderness areas, aquatic preserves, major rivers and estuaries, state environmentally endangered lands, Outstanding Florida Waters, and aquifer recharge areas, the uncontrolled private or public development of which would cause substantial deterioration of such resources.

39-14.0011 (F.A.C.) Opening or Closing Areas. The Commission may establish refuges, wildlife management area, fish management areas, wildlife and environmental areas, wild hog areas and miscellaneous areas and regulate and manage the land or water therein in the best interest of the state; and in furtherance thereof: (1) Open or close any lake, stream or river or parts thereof, an county or part of a county to the taking of wildlife or freshwater fish for the purpose of establishing, protecting, or managing wildlife or freshwater fish, and prohibit hunting, trapping or fishing within such areas.

39-18.004 (F.A.C.) Regulations in Wildlife Refuges. No person shall take or possess any wildlife on any area established as a wildlife refuge; or take or possess any freshwater fish on any area closed to the taking of freshwater fish. In any wildlife refuge, no person shall be in possession of a gun, dog, trap or other device for taking wildlife.

39-19.002 (F.A.C.) Establishment of Restricted Hunting Areas, and Bird Sanctuaries, Procedure. (1) The Commission may establish bird sanctuaries for the protection of all birds and other wildlife and restricted hunting areas within any developed area upon the written request of the local governmental body having jurisdiction over such areas. In requesting establishment of such restricted hunting areas or bird sanctuaries, the governing body shall, by proper resolution or ordinance, officially agree to assume the responsibility for enforcement of regulations of the Commission which apply to such areas, including posting the area boundary with signs bearing words “RESTRICTED HUNTING AREA, Hunting by Special Permit Only” or “BIRD SANCTUARY, No Hunting” “established by Rule 39-19.002, F.A.C.” which shall be place at intervals of no more than 500 feet, be easily visible from any point of ingress or egress and provide other necessary notice of such are to the public. Said governing body shall agree to instruct its duly authorized law enforcement personnel to enforce said regulations with the area.

39-19.004 (F.A.C.) Regulations in Bird Sanctuaries. No person shall take any wildlife in any bird sanctuary using a gun unless such taking is authorized by specific rule relative to such sanctuary.

39-19.005 (F.A.C.) Establishment and Protection of Critical Wildlife Areas. (1) Critical wildlife areas may be established by the Commission with prior concurrence in such designation by the owner of the property wherein the area is situated. All areas shall be described in the order with sufficient specificity as to permit identification and shall be posted by the Commission so as to provide due notice as to the identity and status of the area. The order establishing the critical wildlife area shall contain the dates during which the tract shall be accorded maximum protection from human or vehicular disturbance. (2) No person shall take or disturb any wildlife within any critical wildlife area during the period designated by the order establishing such area. No person shall enter or operate a vehicle within any critical wildlife are during any period in which public access is prohibited by the order establishing such area.

Appendix L: Wood Stork Management Guidelines

INTERNATIONAL STATUSES, TREATIES, AND AGREEMENTS:
(Taken from Virginia Tech–Dept. of Fisheries & Wildlife Sciences 1996a.)
None.

U.S. STATUS AND LAWS:
(Taken from Virginia Tech–Dept. of Fisheries & Wildlife Sciences 1996a.) The U.S. breeding population of the wood stork (Mycteria americana) has been designated as Endangered pursuant to the Endangered Species Act of 1973 (50 CFR 17.11; P.L. 93-205, 87 Stat. 884; 16 U.S.C. 1531-1540), as amended. Critical Habitat has not been designated.

This species is protected by the Lacey Act (P.L. 97-79, as amended; 16 U.S.C. 3371 et seq.) which makes it unlawful to import, export, transport, sell, receive, acquire, or purchase any wild animal(alive or dead including parts, products, eggs, or offspring):

(1) in interstate or foreign commerce if taken, possessed, transported or sold in violation of any State law or regulation, or foreign law; or
(2) if taken or possessed in violation of any U.S. law, treaty, or regulation or in violation of Indian tribal law.

It is also unlawful to possess any wild animal (alive or dead including parts, products, eggs, and offspring) within the U.S. territorial or special maritime jurisdiction (as defined in 18 U.S.C. 7) that is taken, possessed, transported, or sold in violation of any State law or regulation, foreign law, or Indian tribal law.
The species is protected by the Migratory Bird Treaty Act
(16 U.S.C. 703-711 et seq.) (50 CFR 10.13).

All Federal agencies have responsibility to ensure that any action authorized, funded, or carried out by that agency is not likely to jeopardize the continued existence of the species or result in the destruction or adverse modification of Critical Habitat (50 CFR 402), and to utilize their authorities to carry out programs for the conservation of the species.

STATE STATUS AND LAWS:
(Taken from Virginia Tech–Dept. of Fisheries & Wildlife Sciences 1996a.)
STATE: Florida
DESIGNATED STATUS: Endangered
ADMINISTRATIVE AGENCY: FL Dept. of Environmental Protection
FL Fish and Wildlife Conservation Commission
STATE STATUTE: FL, Endangered and Threatened Sp. Act of 1977, FL Stat. Annot. Sec. 372.072; FL Admin. Code, Rule 39-27.03, July 1983.

Recovery actions for the wood stork include:
(Taken from Virginia Tech–Dept. of Fisheries & Wildlife Sciences 1996a.)

I. Establish secure habitat for the life cycle of the wood stork.
   A. Provide adequate feeding habitat for existing rookeries.
      1. Determine feeding areas essential to support rookeries and non-breeding assemblages. Identify water management necessary to maintain suitable feeding conditions (e.g., water levels and water flow). Implement water management

practices favorable to wood stork productivity.

2. Identify other threats to feeding areas and implement appropriate protective or corrective measures. Potential threats may include: water drawdown, controlled burning, vegetation management, backpumping, environmental contaminants, and/or pesticides.

B. Protect wood stork rookeries.

1. Conduct an annual census of U.S. rookeries.
2. Maintain favorable rookery conditions. Protect colonies from disturbance such as logging. Maintain water levels (although drawdowns at appropriate intervals may be necessary). Prevent human disturbance and control development. Encourage public and private land owners to provide suitable nesting conditions (cooperative agreements may be beneficial).

II. Develop models for population dynamics and movements of wood storks. Monitor post-breeding dispersal and rookery shifts. Develop life tables. Determine population genetics. Incorporate results of the above into recovery goals.

III. Develop public awareness of wood stork and wetland problems.

Management Practices:

(Taken from Virginia Tech–Dept. of Fisheries & Wildlife Sciences 1996a.)

Beneficial	Restricting/regulating human disturbance of populations
Beneficial	Maintaining/Controlling Water Flow
Beneficial	Developing/maintaining/protecting wetlands
Beneficial	Controlling water levels
Beneficial	Maintaining undisturbed/undeveloped areas
Beneficial	Land Acquisition
Beneficial	Controlling pollution [thermal, chemical, physical]
Beneficial	Controlling/Restricting Pesticide Use
Beneficial	Restricting Timber Harvest
Adverse	Incidental Capturing/Killing
Adverse	Food Supply Reduction
Adverse	Draining wetlands, marshes, ponds, lakes
Adverse	Strip mining
Adverse	Water Level Stabilization
Adverse	Water Level Fluctuation
Adverse	Flooding
Adverse	Groundwater drawdown
Adverse	Irrigating
Adverse	Dredging
Adverse	Fire
Adverse	Harvesting

Multi-Species Recovery Plan Recommendations:
(Taken from U.S. Fish and Wildlife Service 1999e.)

Nesting habitat should be protected from disturbance and human alteration through purchase into the public lands system, easements, partnerships and private landowner/government assistance and agreements. Watersheds supporting natural nesting habitat should remain unaltered, or be restored to function as a natural system if previously altered.

Ogden (1990) developed a set of management guidelines for the FWS on wood stork nesting, feeding, and roosting habitats. The guidelines recommend buffer zones that may be necessary to reduce human disturbance of storks in feeding and roosting habitats. These efforts have substantially contributed to the protection of stork habitat, particularly where new developments have been proposed in areas used by storks. The buffer zones recommended in the management guidelines are larger than those recommended by Rodgers and Smith (1995) in their analysis. At the time the guidelines were developed, little empirical data were available on the response of wood storks to human activities. Rodgers and Smith analyzed only three types of human activities: walking, canoeing, and a small motorboat with two persons. They did not evaluate responses to other activities such as construction or aircraft. The current guidelines recommend buffer zones to protect colonies from many kinds of activities including human disturbance. Rodgers and Smith, (1997) study of human disturbance to foraging and loafing waterbirds recommends a buffer of about 100 meters.

Appendix M: Bald Eagle Management Guidelines

INTERNATIONAL STATUSES, TREATIES, AND AGREEMENTS:

(Taken from Virginia Tech–Dept. of Fisheries & Wildlife Sciences 1996b.)
The bald eagle (Haliaeetus leucocephalus) is listed in Appendix I of CITES. The white-tailed eagle (Haliaeetus albicilla), a synonym for the bald eagle, is listed as Vulnerable in the IUCN Red Data Book, 1979. The southern bald eagle (Haliaeetus leucocephalus leucocephalus) is listed as Endangered in the IUCN Red Data Book,1979, and as rare by the U.S. in the Western Hemisphere Conv. Annex,1967.

The bald eagle in Canada, examined by the Comm. on the Status of Endangered Wildl. in Canada (April 1985) was judged not in any "risk" category. Raptors are not included under Canada's Migratory Bird Convention Act. Most Provinces and Territories have Fish and Wildlife Acts and most protect raptors. Provincial Endangered Species lists are maintained by Ontario (Endangered Species Act, Chapter 138, Rev. Stat. of Ontario, 1980) and New Brunswick (Chapter E-9.1, Reg. 82-248, Endangered Species Act). The eagle is listed as Endangered on these lists.

The bald eagle is on that listed by Mexico in "Especies de Fauna en Peligro de Extincion en Mexico."

U.S. STATUSES AND LAWS:

(Taken from Virginia Tech–Dept. of Fisheries & Wildlife Sciences 1996b.)
The bald eagle (Haliaeetus leucocephalus) has been designated an Endangered species in the conterminous United States except in the States of Washington, Oregon, Minnesota, Wisconsin, and Michigan where the bald eagle has been designated a Threatened species pursuant to the Endangered Species Act of 1973 (50 CFR 17.11; P.L. 93-205, 87 Stat. 884; 16 U.S.C. 1531-1540), as amended. Critical Habitat has not been designated for this species.

Special rules concerning "take" of individuals from the States where eagles are designated as Threatened can be found in 50 CFR 17.41(a). Rules concerning eagle permits can be found in 50 CFR 22.

This species is also protected by the Lacey Act of 1900 (P.L. 97-79; 16 U.S.C. 3371 et seq.), the Migratory Bird Treaty Act of 1918 (50 CFR 10.13; 16 U.S.C. 703-711 et seq.), and the Bald Eagle Act of 1940 (16 U.S.C. 668-668d; 54 Stat. 250), as amended.

All Federal agencies have responsibility to ensure that any action authorized, funded, or carried out by that agency is not likely to jeopardize the continued existence of the species or result in the destruction or adverse modification of Critical Habitat (50 CFR 402).

STATE STATUS AND LAWS:

(Taken from Virginia Tech–Dept. of Fisheries & Wildlife Sciences 1996b.)
DESIGNATED STATUS: Threatened.
STATE/ADMINISTRATIVE AGENCY/STATE STATUTES:
(FL) Fish and Wildlife Conservation Comm./ Rule 39-27.03 FL Admin. Code, July 1983

Recovery Actions:
(Taken from Virginia Tech–Dept. of Fisheries & Wildlife Sciences 1996b.)
None listed.

Management Practices:
(Taken from Virginia Tech–Dept. of Fisheries & Wildlife Sciences 1996b.)

Beneficial	Controlling/Restricting Air Space Usage
Beneficial	Controlling/Restricting Boating Activities
Beneficial	Controlling/Restricting Off-Road Vehicles
Beneficial	Restricting/regulating human disturbance of populations
Beneficial	Developing/maintaining/protecting wetlands
Beneficial	Controlling water levels
Beneficial	Controlling/Restricting Mining
Beneficial	Controlling/Restricting Road Maintenance Actions
Beneficial	Maintaining undisturbed/undeveloped areas
Beneficial	Restricting/regulating human use of habitats
Beneficial	Land Acquisition
Beneficial	Water Right Acquisition
Beneficial	Controlling pollution [thermal, chemical, physical]
Beneficial	Controlling/Restricting Pesticide Use
Beneficial	Controlling/Restricting Herbicide Use
Beneficial	Controlling/Restricting Agricultural Practice
Beneficial	Creating Artificial Habitat/Nesting Structure
Beneficial	Reforestation
Beneficial	Restricting Timber Harvest
Beneficial	Maintaining Later Stages of Succession
Beneficial	Stocking captive-reared wild-strain animals
Beneficial	Transplanting wild animals
Beneficial	Transplanting Wild Eggs/Wild Seeds
Beneficial	Supplemental Feeding
Beneficial	Disease Control Measures
Beneficial	Rehabilitating Individuals
Beneficial	Restricting Poaching
Adverse	Harassment/Vandalism/Indiscriminate Killing
Adverse	Commercial Exploitation
Adverse	Sport Hunting/Fishing
Adverse	Off Road Vehicles
Adverse	Boating
Adverse	Hiking/Camping
Adverse	Food Supply Reduction
Adverse	Surface Mines
Adverse	Rural Residential/Industrial Areas
Adverse	Recreational development
Adverse	Transmission Lines/Towers
Adverse	Soil compaction by heavy equipment in mine areas
Adverse	Siltation
Adverse	Dissolved Oxygen Reduction
Adverse	Draining wetlands, marshes, ponds, lakes
Adverse	Reservoirs
Adverse	Dredging
Adverse	Developing/maintaining stream bank vegetation
Adverse	Shoreline modification/development
Adverse	Applying pesticides

Adverse	Environmental Contamination/Pollution
Adverse	Predator control
Adverse	Grazing
Adverse	Forest Alteration
Adverse	Harvesting

Multi-Species Recovery Plan Recommendations:

(Taken from U.S. Fish and Wildlife Service 1999e.)

To help achieve recovery goals for the bald eagle, the FWS, with the assistance of State wildlife resource agencies, produced bald eagle habitat management guidelines that provide recommendations to avoid or minimize detrimental human-related impacts on nesting bald eagles (FWS 1987). These habitat management guidelines provide much of the direction for the management of bald eagles in the U.S. and include measures designed to maintain or improve environmental conditions (FWS 1987). Though the guidelines vary slightly from region to region, they generally provide for the spatial and temporal protection of nesting and foraging sites and flight paths. These guidelines have been widely adopted by Federal and State agencies and are applied to both public and private lands. A principal component of the guidelines for the southeastern U.S. includes a recommendation that two protective zones be established around bald eagle nests. A primary zone is recommended to encompass an area extending outward from the nest tree between 230 m and 460 m. The exact distance encompassed by this zone is dependent on the location of feeding areas, roosts, and perch sites within a particular nesting territory (FWS 1987). Within the primary zone it is recommended that certain activities be avoided at all times. Activities to be avoided include: residential, commercial, or industrial development, tree cutting, logging, construction, mining, or use of chemicals toxic to wildlife.

Activities such as human entry and low-level aircraft flights over the primary zone are not recommended during the nesting season, but may be allowed in some situations during the non-nesting season. The guidelines recommend a secondary zone extending from the outer boundary of the primary zone outward up to 1.6 km. Restrictions within the secondary zone are recommended to minimize disturbance that might compromise the integrity of the primary zone and to protect areas used by the nesting eagles outside of the primary zone (USFWS 1987). Restrictions are recommended on new commercial and industrial development, construction of multi-story buildings or high-density housing developments, construction of roads that increase access to nest sites, and use of chemicals toxic to wildlife. Most other sources of disturbance are allowed within the secondary zone during the non-nesting season.

The guidelines have been used many times in Florida to avoid or minimize adverse effects to nesting bald eagles. Studies to evaluate the effectiveness of the guidelines in protecting bald eagle habitat and found that eagle use and productivity was not significantly affected by human encroachment when the guidelines were implemented and adhered to. These results indicate that limited human encroachment was not yet affecting nesting eagles and that no modifications to the guidelines were needed in Florida. Evaluation of long-term trends in nest success and productivity should provide the information necessary to evaluate continued effectiveness of the guidelines. Data analyses are anticipated to reveal regional differences, principally due to variations in duration, type, and magnitude of threats to bald eagles. If the

results indicate decreasing trends either regionally or statewide, guideline modifications will identify more stringent protection of breeding and foraging habitat. Conversely, where trends are increasing, it is expected that the modified guidelines will relax some or all of the protective restrictions. The effects of disturbance on bald eagles have become apparent over time in portions of the eagles' range. It is clear that bald eagle habitat is slowly being altered or destroyed throughout much of the species' range. The impacts are "cumulative and may have few effects on a local and short-term basis, but because it [habitat alteration] is so widespread and long-term in nature, the effects to eagles are tremendous." This referred to the effects of forest management on bald eagle nesting when he stated that "once altered, forest habitat is rarely allowed to return to the old-growth state that the eagle prefers ...the last vestiges of old growth are now being removed and replaced with fast-growing, economically efficient forest stands." Throughout much of the bald eagles' range, we believe that nesting and wintering habitats are threatened by many other types of anthropogenic factors that will slowly make these areas unsuitable for eagles. However, by all accounts, the bald eagle population in South Florida has increased dramatically over the last 20 years. The success of eagles in Florida may ultimately be the primary reason for the recovery and delisting of eagles in the southeastern U.S. Even in this time of optimism, there remain concerns about the future of bald eagles in South Florida. Researchers indicated that even though the number of nesting eagles in Florida has recovered to one-half to two-thirds of historic numbers, the amount of feeding and nesting habitat remaining in Florida may not be sufficient to support the eagle population that existed in the early 1900s. Researchers indicated that Florida eagles are faced with significant disturbances from human land-use patterns, especially land alterations associated with urban development. In combination, these and other factors may be working synergistically to reduce the value of bald eagle habitat in Florida. Currently, however, the threshold of human disturbance which triggers large-scale observable adverse effects has not yet been reached or is not detectable under current monitoring programs.

In Florida, only the total number of nesting eagles and statewide reproductive success have been used as the benchmarks for assessing the health of the bald eagle population. Undoubtedly, many of the same cumulative effects noted elsewhere are affecting eagles in South Florida. Whether bald eagles in South Florida respond adversely to these cumulative effects is a question that must be answered before we proclaim South Florida's eagle population to be recovered.