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Land Management Plan for the RED BUG SLOUGH PRESERVE

Prepared by
Sarasota County Natural Resources

(FCT Project Number 02-027-FF2)

September 2005

LAND MANAGEMENT PLAN FOR THE RED BUG SLOUGH PRESERVE EXECUTIVE SUMMARY

Red Bug Slough Preserve is a 72-acre preserve located south of Proctor Road, north of Ashton Road and west of Beneva Road, in Section 9, Township 37, Range 18 E, in Sarasota County. Red Bug Slough was acquired in November 2000 and February 2001 by Sarasota County Government. Later, grant funding from the Florida Communities Trust (FCT) was used to acquire the Project Site and the Management Plan was developed to ensure that the Project Site will be developed in accordance with the Grant Award Agreement and in furtherance of the purpose of the grant application. The purpose of site acquisition was to protect and enhance native wildlife habitats that will provide nature-based recreation and environmental education for residents and visitors within the Sarasota County Urban Service Area.

Historically, the uplands on site were dominated by pine flatwoods and dry prairie; the slough is the result of a channelization to assist with stormwater control, particularly in the surrounding neighborhoods. Prior to acquisition, the property was described as "3rd rate pine land" and "rough pine" in an 1847 land survey done by surveyor A.H. Jones. Scattered sawgrass ponds were also noted in this survey. With encroaching development, fire suppression and nuisance exotic species proliferation have occurred and re-defined the character of the site's natural resources. Today, the site is predominantly comprised of mesic hardwood hammock, pine flatwoods, swamp, and open water. The wetland and open water habitats provide feeding, roosting, and nesting habitat for a variety of listed wading birds including white ibis, little blue heron, snowy egret, and tricolored heron.

The County has constructed limited nature-based recreational infrastructure at the Preserve to provide access to the community, and fencing around the perimeter. At the main entrance along Beneva Road, there is currently a shell parking area, picnic and playground facilities, informational kiosks, butterfly gardens, and hiking trailheads. Scenic fitness and hiking trails traverse the site, with benches located adjacent to the waterway. Interpretive signage, a fishing pier, and a boardwalk are proposed.

Red Bug Slough Preserve has been assigned Level I, Basic Management, and Level III, Nature Based Recreation Sites and Restoration Properties, management strategies as defined in the "Land Management Master Plan of Sarasota County: Managing the County's Natural Environmental Areas."

The emphasis of the Basic Management strategy is to secure the site from vandalism, degradation, and exotic species proliferation. These objectives shall be achieved with monthly site visits by County staff, quarterly visits by the site's manager, and an annual report that summarizes issues related to exotic species control and other restoration activities, visitor uses and unauthorized access, what additional management activities or improvements could be instituted, and other relevant observations.

Level III Management is appropriate for Red Bug Slough, which will be managed with an emphasis on developing resource-dependent recreational activities. This level of management cannot be undertaken without accurate, site-based information and a

disciplined planning process. This management plan initiates this planning process. Based on the annual summary report, appropriate adjustments shall be made to rectify any issues that are not addressed in this plan. This plan identifies management strategies that shall be implemented through 2010.

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RED BUG SLOUGH PRESERVE

INTRODUCTION

The Red Bug Slough Preserve is a parcel of land totaling 72 acres that was initially purchased under Sarasota County's 1999 Environmentally Sensitive Lands referendum. Red Bug Slough Preserve is located south of Proctor Road, north of Ashton Road, and west of Beneva Road, in Section 9, Township 37 S, Range 18 E, Sarasota County (see Figure 1). The project site is located within the Sarasota County Urban Service Area. The land surrounding the Preserve is primarily residential, with some commercial and mixed-use development.

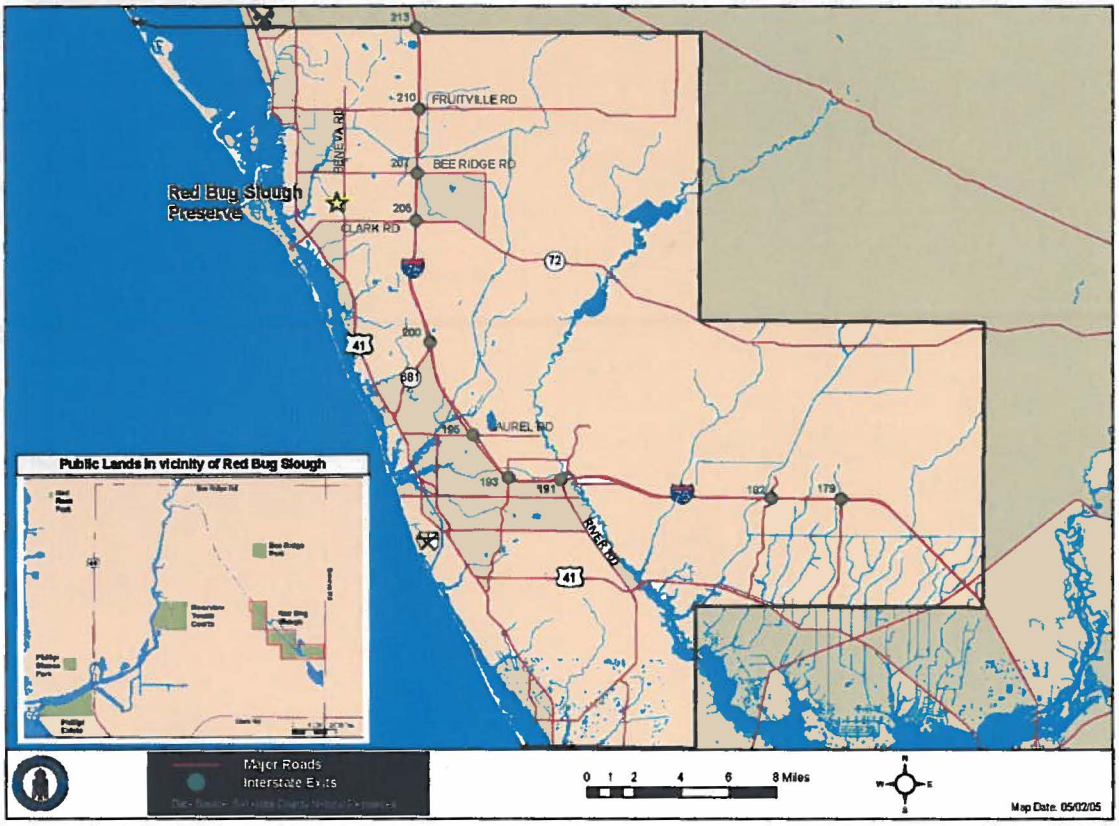

Figure 1: Red Bug Slough Preserve, Project Location

Site Significance

Red Bug Slough Preserve is a distinctive piece of property because it is a relatively large parcel of natural habitats in an urban setting that provides convenient access to natural lands in close proximity to a highly populated area. The open water also provides sanctuary for aquatic life and potential for recreational usage.

In 2005, Red Bug Slough Preserve was accepted as a Great Florida Birding Trail Site by the Florida Fish and Wildlife Conservation Commission. This designation is a result of the wide variety of upland and wading birds present and highlights the preserve's importance as an urban wildlife site.

The project site will be managed only for the conservation, protection, and enhancement of natural resources, and for public outdoor recreation that is compatible with the conservation, protection and enhancement of the project site. Scientific research, environmental education, and nature-based recreation will be encouraged as long as they do not jeopardize the protection of natural resources.

Land Use Designation

The current land use designation is Public Conservation/Preservation. The Board of County Commissioners adopted Ordinance No. 2004-002, which approves Comprehensive Plan Amendment RU-105 on January 14, 2004. This fulfills the obligation outlined in section III.3 of the Red Bug Slough (FCT Project #02-027-FF2) Grant Award Agreement.

Environmentally Sensitive Lands Protection Program

Sarasota County Comprehensive Plan provides for the protection and management of the County's native habitats, balanced with the need for public resource-based, ecologically benign, and non-consumptive recreation.

The Environmentally Sensitive Lands Protection Program (ESLPP) acquires and protects natural lands. Priority sites within Sarasota County are selected using the following environmental criteria: connectivity, water quality, habitat rarity, land quality, and manageability.

The Red Bug Slough Preserve parcels were acquired in November 2000 and February 2001 by Sarasota County. Later, matching grant funding from the Florida Communities Trust (FCT) under the Florida Forever Program was used to offset acquisition costs (Grant Award dated 5/12/03). The management plan was written to ensure that the Preserve is developed in accordance with the FCT Grant Award Agreement and in furtherance of the purpose of the grant application. This Preserve is managed consistent with the purposes and intent of the ESLPP, with funds from Sarasota County's general fund. Specific commitments within this agreement are addressed within this plan.

Purpose and Scope of Plan

Each preserve within the County is managed in a manner consistent with the Land Management Master Plan (LMMP) of Sarasota County (Perry, 2004). The intent of the LMMP is to provide focus and direction for proactive, rather than reactive, land management activities at the community and landscape levels throughout the County. Consequently, each environmental land is assigned an appropriate management level(s) and actions are planned accordingly. At this time, the County will implement Level I,

Basic Management, and Level III, Nature Based Recreation Sites and Restoration Properties, management strategies as defined in the LMMP at Red Bug Slough Preserve.

The emphasis of the Basic Management strategy is to secure the site from vandalism, degradation, and exotic species proliferation. These objectives shall be achieved with monthly site visits by County staff, quarterly visits by the site's manager, and an annual report that summarizes issued related to exotic species control and other restoration activities, visitor uses and unauthorized access, what additional management activities or improvements could be instituted, and other relevant observations.

The Level III management strategy emphasizes the development of resource-dependent recreational activities. This level of management cannot be undertaken without accurate, site-based information and a disciplined planning process.

Management Authority and Responsibility

Management authority is the responsibility of Sarasota County Natural Resources. The public use component is the responsibility of Sarasota County Parks and Recreation. Sarasota County Public Works, Stormwater Management, is responsible for any necessary maintenance of the Red Bug Slough channel that extends diagonally across the Preserve and the contiguous lake and associated control structures, as well as adjacent drainage ditches.

NATURAL RESOURCE COMPONENT

Resource Description and Assessment

Location and Setting

The Preserve is located in a densely populated suburban setting in northwest Sarasota County south of Proctor Road, north of Ashton Road, and west of Beneva Road within the Urban Service Area (see Figure 1). Both of these roads are dominated by commercial properties and office complexes; the surrounding areas are residential. The last remaining farmland (citrus groves) are currently being converted to residential development (2004). The land surrounding the Preserve is primarily residential, with some commercial and mixed-use development.

Climate

The climate of Sarasota County is oceanic and subtropical. The temperature is influenced by latitude, low elevation, winds that sweep across the peninsula, and proximity to the Gulf of Mexico. Consequently, the climate is characterized by high relative humidity, short mild winters, long warm summers, and rainfall that is abundant throughout the year, but is heaviest from June through September (Hyde et al., 1991).

Topography, Soils, Hydrology

Topography (see Figure 2). Nearly all of Sarasota County is in the Gulf Coastal Lowlands (White 1970). While the site is relatively flat, Red Bug Slough was channelized in the early part of the century for the purpose of stormwater control; spoil berms remain on the Preserve site. The lowest elevation is in the slough; the highest elevation is to the near the Beneva Road entrance. The ground elevation ranges from 15 to 27 feet above sea level.

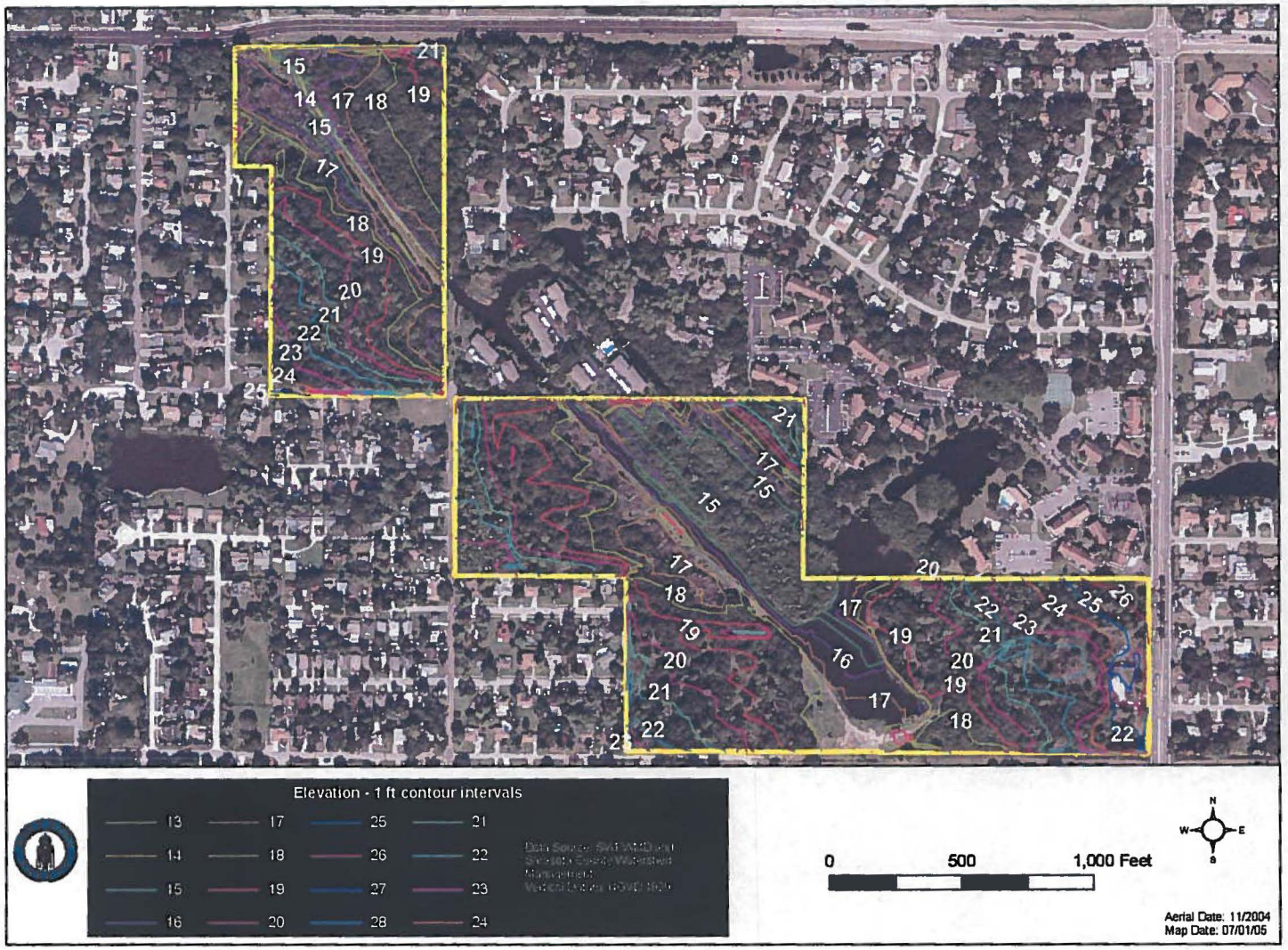

Figure 2: Red Bug Slough Preserve, Topography

Soils (see Figure 3). There are two types of soil classes on site: Mesic and Xeric. Mesic correspond to upland areas; hydric correspond to wetland areas. The mesic soils are: Eugallie and Myakka fine sands (Mapping Unit 10; Hyde, *et al.*, 1991). EauGallie and Myakka fine sands are nearly level, poorly drained soils on broad flatwoods. This corresponds to the areas that are now hammock or pine flatwoods.

The hydric soils are Felda fine sand (Mapping Unit 11), Floridana and Gator soils, depressional (Mapping Unit 15), and Manatee loamy fine sand, depressional (Mapping Unit 26). These soils are formed in thick beds of sandy and loamy marine sediments. Felda fine sand is loamy, siliceous, also nearly level, poorly drained soil, on low hammocks or floodplains, or on low broad flats or depressions. Felda soils correspond to the lower areas that lie adjacent to the Slough. Floridana and Gator soils are loamy, siliceous, nearly level, very poorly drained soils that occur in poorly defined drainage ways, in depressions, on broad, low flats or in freshwater swamps and marshes. Floridana and Gator soils correspond to the swamp in the northeastern portion of the preserve. Manatee loamy fine sand is coarse-loamy, siliceous, poorly drained soil, nearly level in depressions that formed in sandy and loamy marine sediments. Manatee soils correspond to the open, mowed areas at the southern end of the slough and the lower hammock areas that lie adjacent to the slough.

Figure 3: Red Bug Slough Preserve, Soils

Hydrology. Historically, Red Bug Slough was a natural slough that functioned as a drainageway for the surrounding landscape, flowing from wetlands that existing south of Clark Road to where it met Phillippi Creek south of Bee Ridge. The slough was channelized and some of the contiguous wetlands dredged into lakes for stormwater control as the surrounding neighborhoods were developed.

Presently, floodwaters that enter Phillippi Creek are detained on this site, which improves water quality in that section of the Creek. Red Bug Slough still drains from retention lakes north and south of Clark Road and northwest of Phillippi Creek. Approximately 85 % of the site is located within the 100-year flood plain of Phillippi Creek (see Figure 4).

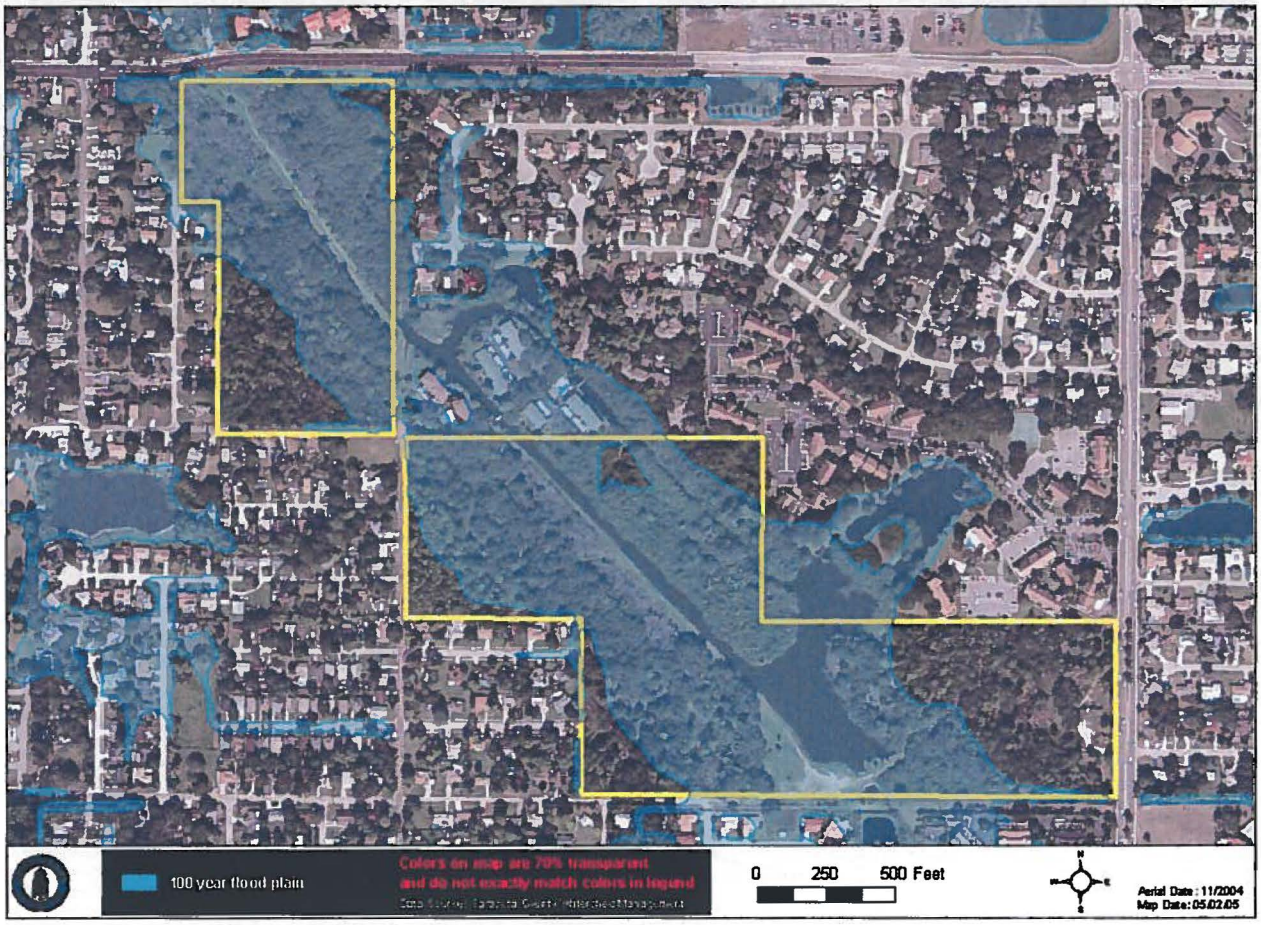

Figure 4: Red Bug Slough Preserve, 100 Year Flood Plain

Cultural/Historical Setting and Resources

Early surveys of the area (1840s and 1870s) characterized the preserve as "3rd rate pine" or "rough pine." In addition, several sawgrass ponds were also recorded. In 1881, Hamilton Disston purchased four million acres of land (including the preserve) deemed "swamp and overflow land" by the federal government. These lands had been turned over to the State of Florida for drainage and reclamation in 1880. Disston, along with English investor Sir Edward James Reed then deeded large tracts of land to several private corporations, including the Florida Land and Improvement Company. All of present day Red Bug Slough Preserve was deeded to the Florida Land and Improvement Company on February 3, 1883. (Archaeological Consultants, Inc., 2005).

In later years, the Red Bug Slough Preserve area came to be known as Alford Sawgrass (Luer, 1995), after local vigilante Jason S. Alford who owned some adjacent land. Alford was a member of the "Sara Sota vigilance Committee" who were suspicious of Sarasota resident Charles Abbe's land dealings and took issue with his political beliefs (Marth, 1973:13; Matthews, 1989). Alford was later implicated in Abbe's murder, but was ultimately found to be innocent.

An archaeological survey was conducted in 2005 (Archaeological Consultants, Inc., 2005). The survey discovered three archaeological occurrences (lithic scatter) and two significant archaeological features: the slough and the ditch (see Figure 5). This information was submitted to the State Master file in May 2005.

Plant Communities

The Preserve consists of four dominant natural communities delineated according to the classification methodologies of the Florida Natural Areas Inventory (FNAI, 1990) and Florida Land Use Cover and Classification System (FDOT, 1999) as mesic hammock (34.2 acres), pine flatwoods (14.07 acres), basin swamp (0.92 acres), and hydric hammock (1.69 acres). These natural communities make up 50.88 acres or 59% of the Preserve. They are generally good quality communities with at least 70% native vegetative cover that will be managed and improved with regular monitoring and maintenance activities. The remaining acreage of the site includes 20.8 acres dominated by highly invasive exotic plants, a 1.7-acre spoil area, and 0.9 acres of disturbed lands (See Figure 6).

Mesic Hammock

The mesic hammock is the consequence of fire suppression. This is evident with a glance at the 1948 aerial, which clearly shows the uplands as pine flatwoods. It is dominated by tall cabbage palm (*Sabal palmetto),* saw palmetto (*Serenoa repens*), wax myrtle (*Myrica cerifera),* and water oak (*Quercus nigra*). The understory is very open and includes saw

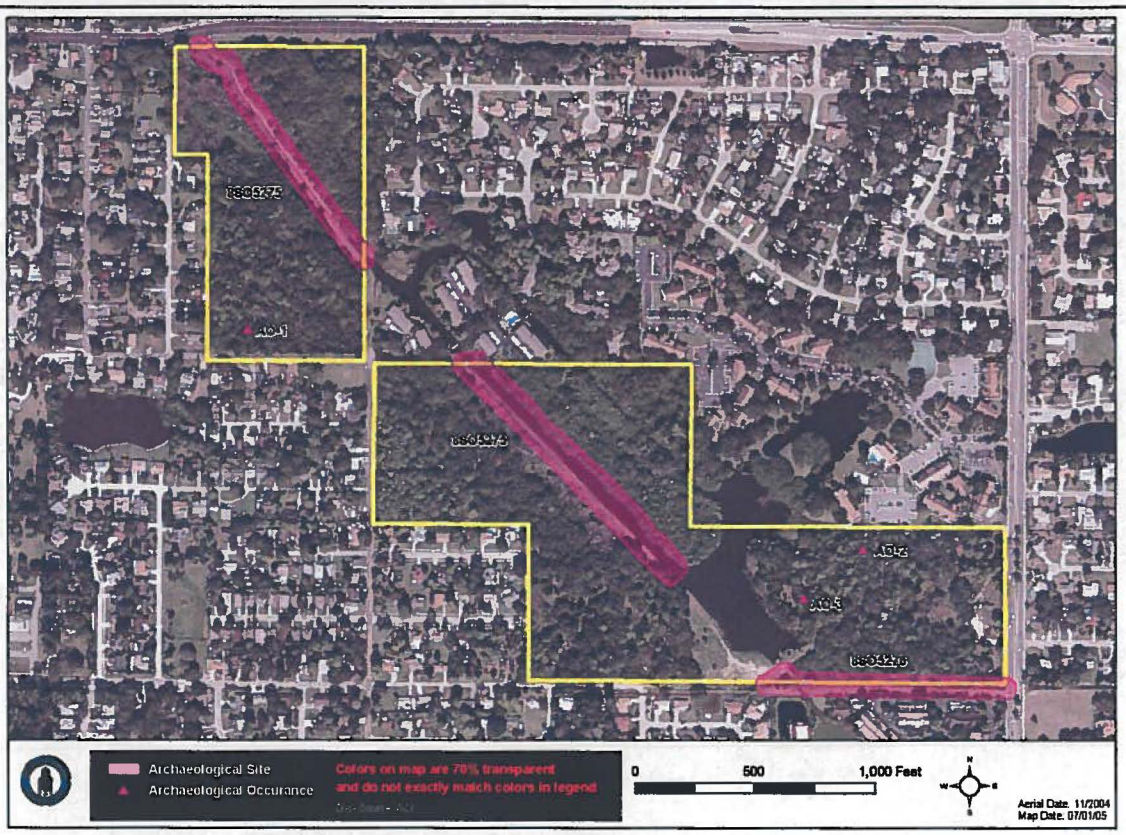

Figure 5: Red Bug Slough Preserve, Cultural and Historical Resources

palmetto (*Serenoa repens*), wax myrtle *(Myrica cerifera*), short-leaf wild coffee, (*Psychotria sulzneri*), and beauty berry (*Callicarpa americana*). The hammock areas have been impacted by the disposal of trash on the project site and the invasion of exotic vegetation. These upland communities provide habitat for listed species, including but not limited to gopher tortoise (*Gopherus polyphemus*) and Sherman's fox squirrel (*Sciurus niger shermani*).

Mesic Flatwoods

The mesic flatwoods is also a good quality upland habitat with little disturbance. It is dominated by slash pine (*Pinus elliotii*), live oaks (*Quercus virginiana*) and red maple (*Acer rubrum*) with an understory of saw palmetto (*Serenoa repens*), wax myrtle (*Myrica cerifera*), fetterbush (*Lyonia lucida*), and gallberry (*Ilex glabra*).

Both the prairie hammocks and the mesic flatwoods have been impacted by the disposal of trash on the project site and the invasion of exotic vegetation. The habitats will be restored by the removal of the trash and the exotic vegetation. Subsequently, native plant species will be replanted to replace the exotic vegetation. These upland communities provide habitat for listed species, including but not limited to the gopher tortoise (*Gopherus polyphemus*) and the Sherman's fox squirrel (*Sciurus niger shermani*).

Basin Swamp

The basin swamp is a natural wetland (0.92 acres) irregularly shaped and dominated by live oak, cabbage palm, red maple, and water oak. The groundcover consists of dense grapevine (*Vitis* spp.) and swamp fern (*Blechnum serrulatum*).

Hydric Hammock

The hydric hammock is another natural wetland (1.69 acres) which includes red maple, laurel oak (*Quercus laurifolia*), swamp bay (*Magnolia virginiana*), loblolly bay (*Gordonia lascianthus*), buttonbush (*Cephalanthus occidentalis*), Carolina willow (*Salix caroliniana*), and wax myrtle with an understory of swamp fern, arrowhead (*Sagittaria lancefolia*), sawgrass (*Cladium jamaicense*), and smartweed (*Polygonum* spp.)

Waterways

The waterways and ditches, the channelized Red Bug Slough, comprise 5.5 acres. The eastern shoreline area of the ditch is dominated by Brazilian pepper (*Schinus terebinthifolius*), a highly invasive exotic plant, with scattered Carolina willow (*Salix caroliniana*). The western shoreline is maintained grass and serves as a hiking and recreational trail.

Disturbed, Spoil and Impacted Areas

Disturbed areas are occupied by exotic and invasive plant species, primarily Brazilian pepper and air potato (*Dioscorea bulbifera)*, which cover approximately 23.4 acres of the Preserve. The densest concentration of exotics occurs along the ditches, the slough, and in the spoil area. Removal of Brazilian pepper has commenced, allowing pioneer plant species to start inhabiting these areas.

Flora and Fauna

Preliminary inventories of vegetation occurring on the Preserve have been conducted. All vegetation documented on site has been alphabetized by genus (see Addendum C).

Wildlife documented on site has been sorted by habitat. Documented species are noted on a list that includes all potential species (See Addendum D). Documented species lists are linked to the habitat polygon on the Natural Communities map (Figure 6).

As the Preserve was acquired in part to preserve the native vegetation communities and wildlife habitats on the site, more detailed surveys will identify the presence of any rare species and/or those listed as Endangered, Threatened, as a Species of Special Concern, or as Commercially Exploited by state and federal agencies. In addition to the numerous listed wading birds that have been documented, the Florida Fish and Wildlife Conservation Commission lists 34.2 acres of the Preserve as a Strategic Habitat

Conservation Area for the black-whiskered vireo, a bird species requiring mangrove forest or hammock adjacent to mangrove forest. (The occurrence of this species on the preserve is highly unlikely in that this condition does not occur nor has it ever occurred on site.)

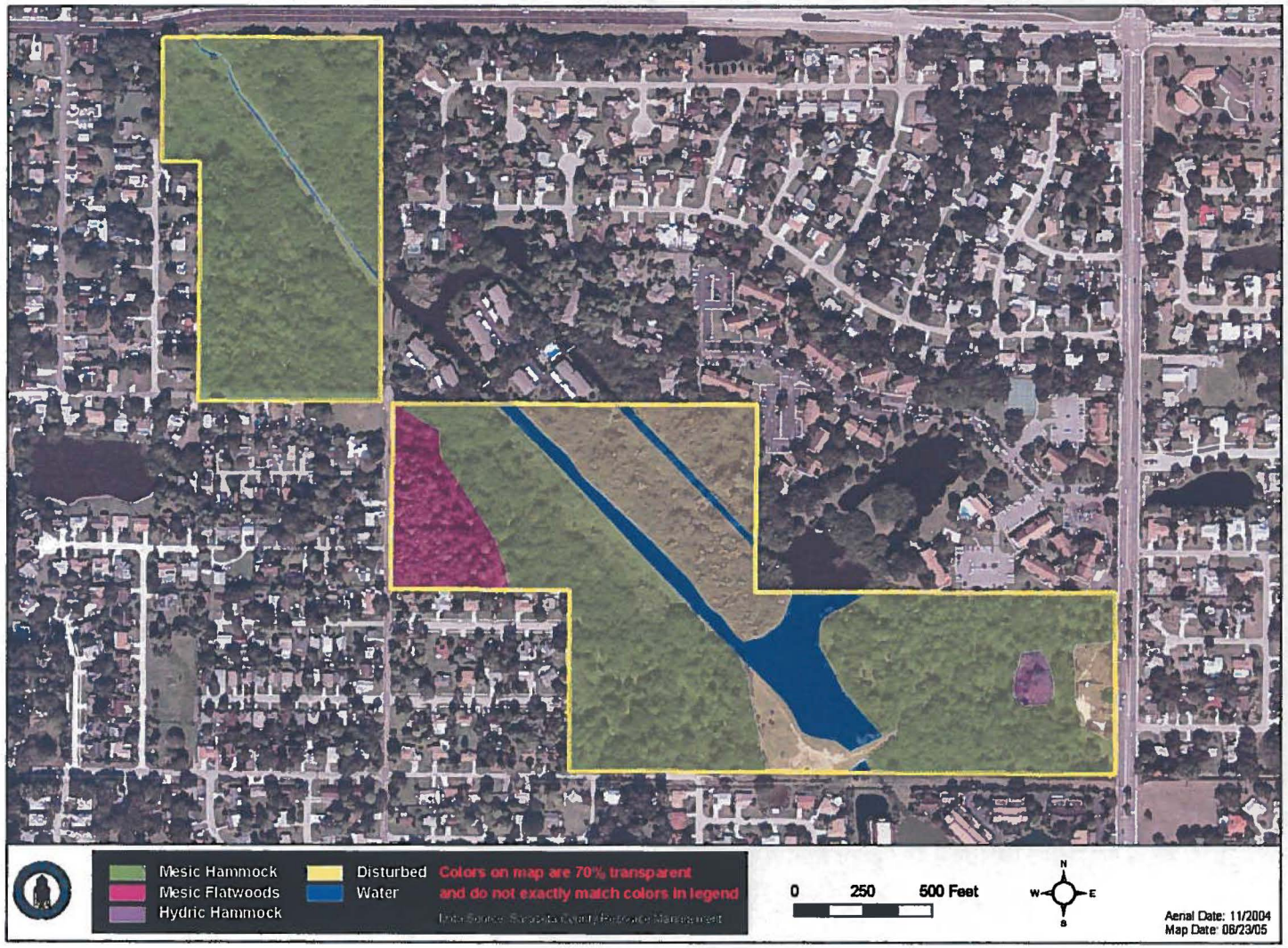

Figure 6: Red Bug Slough Preserve, Natural Communities

Any occurrence of rare or listed plant and wildlife species will be reported to appropriate agencies as well as the Florida Natural Areas Inventory.

Special Elements

Special elements are defined as site characteristics that warrant particular management attention and potential action.

Exotic plant species, those introduced to Florida from a natural range outside of the state, can have adverse effects on biodiversity and functioning of native habitats (Langeland and Burks, 1998). While Brazilian pepper is primarily found inhabiting the ditch and slough areas, air potato and several other exotic plants, including sword fern (*Nephrolepis cordifolia*), Caesar's weed (*Urena lobata*), and creeping oxeye (S*phagneticola trilobata*), can be found inhabiting the natural communities throughout the Preserve. The Florida Exotic Pest Plant Council lists Brazilian pepper, air potato, and sword fern as Category I plants, "invasive exotics that are altering native plant communities by displacing native species, changing community structures or ecological functions, or hybridizing with natives" (FLEPPC, 2005).

Species according to the Florida Exotic Pest Plant Council. (2004). By definition, these are "species that are invading and disrupting native plant communities in Florida". Quick eradication using appropriate species-specific eradication techniques is required to control these rapidly colonizing species. Control methods used are based on the most up to date techniques as detailed by the Florida Department of Environmental Protection, Bureau of Invasive Plant Management and other local, regional and federal resource management agencies. Nuisance and exotic species eradication control techniques are summarized in Addendum C.

Exotic animal species can also have detrimental impacts on native plant communities and wildlife. Due to the close proximity of residential neighborhoods, feral cats (*Felis catus*) may be likely to occur on the Preserve. Cuban treefrogs (*Osteopilus septentrionalis*), non-native amphibians common in southwest Florida, are large, prolific and aggressive. Both of these species can decimate native wildlife populations.

Additionally, quarterly evaluations of nuisance exotic plant species populations should be conducted to assess the success of treatment as well as the need for additional control.

Inventory Needs

Initial site assessments and preliminary site evaluations have been conducted on the Preserve pursuant to the "Survey Protocol for Master Land Management Plan of Sarasota County" (see the LMMP Addendum). The initial site assessment is a one-time-only, general survey used to prioritize sites for acquisition. The preliminary site evaluation is conducted to determine general habitat species composition, identify potential listed

species and exotic species, and make preliminary, focused attempts to verify if listed species are present. These are the appropriate levels of general inventory for a preserve managed at Level I.

Coarse filter surveys are recommended to occur at a minimum of once every five years for preserves managed at Level III. The survey methods are designed to efficiently provide managers with site-specific floral and faunal inventories, characterizing species richness and not abundance. Through time, the data collected can be tracked by repeating the surveys with the development of every management plan update. In the event that these coarse filter surveys document listed species use of the preserve, said species may be targeted for more intensive surveys. Habitat-specific species richness trends (or the lack thereof) can be identified by comparison of findings on any five-year coarse filter survey.

Site Issues, Management Considerations and Constraints, Restoration Opportunities

The primary issues, considerations for management, and restoration opportunities for the site are:

Removal of exotic vegetation. Brazilian pepper dominates portions of the slough and wetlands on the site. Other nuisance, non-native vegetation has invaded both wetlands and upland habitats. An integrated management approach is necessary to restore these areas. A combination of chemical and mechanical treatments will be used to achieve initial removal, with quarterly monitoring and follow-up treatments to control regrowth and recruitment as it occurs. Those areas with greater than 50% coverage by exotic vegetation should be replanted with appropriate native species indigenous to the particular habitats in this region of southwest Florida.

- *Wetland restoration.* In addition to removal and control of exotic vegetation, wetlands and disturbed areas on the Preserve could be restored with removal of fill material, regrading of spoil berms, and planting appropriate native species. Restoration would improve habitat conditions for wildlife that are known to, or could potentially occur on the Preserve, contribute to improved water quality of Red Bug Slough and Phillippi Creek, provide educational opportunities to visitors on the benefits of native plants, and generally enhance the ecological functions of habitats on the site. Coordination and permitting with other County Departments and state and federal agencies may be required. The County may consider funding this restoration with County projects that have mitigation requirements within the same basin. The littoral zones would need to be created by pulling back the berms, not filling in the Slough so as not to compromise the storm water storage currently provided by the Slough.

Fire suppression. The Preserve contains fire-dependent and fire-adapted habitat types, where fire maintains species composition and ecological integrity. In the absence of fire, fire-dependent habitats, such as mesic pine flatwoods, can have altered structure and diversity and accumulate high loads of fire fuel. Most of the site's hammock was historically pine flatwoods or dry prairie and has succeeded into hammock with fire

suppression. The Preserve is located in a densely populated suburban setting, where the reintroduction of prescribed fire would take careful planning and neighborhood outreach. Mechanical fuel reduction techniques may be utilized as an alternative in order to reduce fuel loads, improving habitat conditions and helping to minimize the threat of wildfire. However, it may be most practical to allow the hammocks to remain hammock.

Resource Management Action Plan

Overall Approach, Special Considerations

Application of the basic concepts of the LMMP has resulted in the conclusion that Level I, Basic Management, and Level III, Nature Based Recreation Sites and Restoration Properties, are the appropriate levels of effort to fulfill the goals identified for the Red Bug Slough Preserve. As prescribed in the LMMP, the "basic elements of an effective management program" are being employed. More specifically:

- First: goals have been established (see below),
- Second: appropriate security issues have been addressed (clearly identify site's boundaries),
- Third: preliminary surveys have been conducted (see Addendum A),
- Fourth: initial critical time intensive management strategies have been implemented (exotic species control has commenced),
- Fifth: the site management plan has been developed (this document),
- Sixth: an annual work plan has been identified and tasks identified (see Table 1), and
- Seventh: progress shall be tracked (see Operations Component Section).

This management plan has been developed to address security, exotic species removal and other restoration opportunities, preliminary site assessments, and the development of an annual work plan and annual review.

Management Goals, Objectives and Actions

The goals for managing the Red Bug Slough Preserve are to achieve the objectives set forth for Level I and Level III management approaches. These are to insure that the site will not significantly degrade after acquisition by the County, to provide for nature-based recreational opportunities, and to restore degraded natural areas.

More specifically, application of these levels of management collectively ensure that the site is secure from intentional acts of vandalism and that it will not significantly degrade from excessive fuel accumulation or exotic species proliferation. Additionally, they ensure that Sarasota County meets the primary purpose of acquisition of the site, which is to protect and enhance wildlife habitats that will provide nature-based recreation and environmental education for residents and visitors within the Urban Service Area. Site-specific key management objectives and proposed actions follow.

- Protection against vandalism and misuse of the natural resources on the site.

Management Action #1: Site Stewardship and Community Involvement. The Preserve boundaries are clearly identified with fencing around the perimeter and signage as to permitted and prohibited activities. Regular visits by County staff can assure that unauthorized access does not occur. Careful planning of infrastructure, as has occurred to date, will assure that visitor usage has minimal impact on the natural areas of the Preserve. Outreach to the surrounding neighborhoods can help to educate the community about the site's uniqueness and involve them in its protection and management.

- Removal of exotic, invasive species and development of a preventative maintenance plan to eliminate the future spread of invasive species.

Management Action #2: Nuisance Exotic Species Removal. Quarterly evaluation of nuisance exotic plant species populations should be conducted to assess the success of treatment as well as the need for additional control. An integrated approach to the removal of exotic species will best achieve this goal, utilizing a combination of mechanical and chemical treatments, using County resources and volunteers from the community, with frequent follow-up and maintenance re-treatment and re-planting of native plant species where appropriate. Control methods used are based on the most up to date techniques as detailed by the Florida Department of Environmental Protection, Bureau of Invasive Plant Management, and other local, regional and federal resource management agencies (See Appendix E for the latest species-specific eradication techniques).

- Development of a habitat management program and enhancement of opportunities for wildlife utilization.

Management Action #3: Restoration of Native Communities. Removal of exotic plants from the Preserve is the necessary first phase to restoring the native plant communities. Regularly scheduled assessments and diligent maintenance by the site managers is necessary to achieve control. In this suburban setting, mechanical fuel reduction within the upland habitats may be an alternative, or precursor, to prescribed burning within the pyrogenic communities. However, this may be counterproductive in that a long-term management approach that re-introduces fire to an urban preserve, may present more safety and logistic problems than is practical for a site of this relatively small size. Management of the upland pyrogenic communities as hammock, reduces the long-term wildfire potential and in this setting is still conducive to the proliferation of native hammock habitat, which also supports many listed species of epiphytes (air plants) and provides a relative oasis for forest species, such as the red-eyed vireo and barred owl.

Restoration of the wetlands with removal of fill material, trash, and debris, proper re-grading of the wetland and spoil areas, and establishment of desirable native plant species, will improve habitat for wildlife and help to improve surface water quality. Use of impervious materials in the trail system and parking area has and will continue to be kept to a minimum.

- Development of the project site with outdoor recreational amenities that allow public access while protecting the natural resources.

Management Action #4: Public Access, Trail Network and Informational Signage. Parking, picnic facilities, observation benches, and trails have been established such that minimal impacts occur to the natural resources of the Preserve. To the extent possible, trails and unimproved access roads existing at the time of acquisition have been utilized in the development of a network of nature trails. Buffers have been provided between these facilities and wetlands on site. A proposed fishing pier and boardwalk will be sited to direct visitors away from the most sensitive of habitats. The addition of informational signage at key points of interest, and provision of park maps, will allow visitors to experience the Preserve while causing minimal impacts.

- Provision of outdoor educational activities that encourage appreciation of natural resource inherent to the Preserve.

Management Action #5: Environmental Education Program. The Preserve provides a unique study area for observing varied wetland and upland habitats, listed species, and edge dynamics due to its setting in a moderately dense suburban area. Programming should consist of interpretive natural history walks, native plant demonstrations, ecosystem and ecological education, and water quality and quantity programming. Sarasota County Natural Resources should continue to establish partnerships to facilitate the environmental education programming, including other County staff, private industry resource management personnel, volunteers, the Audubon Society, Florida Native Plant Society, the Florida House, area colleges and universities (Manatee Community College, New College, Sarasota County Technical Institute, and the University of South Florida), and other non-governmental/non-profit organizations. Projects such as the kiosk and butterfly garden, installed by the Environmental Academy of Booker High School with the Sarasota County Butterfly Club, provide multiple, very positive educational opportunities for the community. The County shall commit to assuring that at least 24 regularly scheduled environmental or historical educational programs at the Project Site shall be conducted by trained educators or resource professionals. FCT will be updated within the annual review on the various educational activities conducted on the Preserve and any revenues collected for such activities and how such revenues were expended.

- Scheduling of annual surveys of listed plant and animal species, and preservation of the habitats that will protect, restore, and preserve the native plants and animals identified on the Preserve.

Management Action #6: Vegetation and Wildlife Monitoring Program. Coarse filter survey methods are designed to efficiently provide managers with site-specific floral and faunal inventories, characterizing species richness and not abundance. Establishment of permanent survey locations will allow for tracking of management progress. Coarse filter surveys may identify any listed species that on the site that may be targeted for

more intensive surveys. Habitat-specific species richness trends (or the lack thereof) can be identified by comparison of findings on any five-year coarse filter survey.

Monitoring Program for Adaptive Management and Restoration

A land manager will visit the site a minimum of four times per year. The boundaries of the most intensively exotic areas shall be located using a Global Positioning System (GPS), and tracked annually. Additionally, preserve staff will visit the site twelve times per year to assess other issues (e.g., security, encroachment, etc.) and report back to the site's designated manager.

Research Needs and Opportunities

There are no research needs at this time. Research opportunities are likely to relate to one particular site characteristic – it is a small, isolated, green space surrounded by suburban development. There are therefore research questions that may be answered related to the urban/environmental lands interface. These questions include, but are not limited to:

- The evaluation of native vs. nuisance exotic re-colonization of nuisance exotic zones that have been treated. This may assist managers in identifying the dispersal mechanisms as well as the treatment needs in a relatively suburbanized setting;
- Songbird use of a hammock system in a suburbanized area. Use should be correlated to habitat type. This may be of use to Sarasota managers in assessing the cross use of song birds that are adapted to suburban areas and hammock, particularly in light of the fact that Sarasota County's preserves are increasingly interfacing with developing areas. This type of study may be conducted using neighborhood volunteers;
- Auditory exotic vs. native anuran species would be valuable in understanding the extent to which exotic species intrude into small isolated green spaces. The Frog Listening Network has conducted a study of this type in Pinellas County with funding from the Pinellas County Environmental Foundation (2003). This could be conducted by local volunteers as well, perhaps the local chapter of the Frog Listening Network.
- Other monitoring programs that track the effectiveness of any future mitigation or management efforts. For example, if a more extensive littoral zone were restored along the slough, how do vegetation, wading birds, reptiles, and amphibians respond?

Public and Interagency Coordination

An annual report shall be submitted to FCT identifying the primary management activities that have occurred in comparison with activities identified as occurring within this management plan.

Successful management of the Preserve includes the coordination with neighbors and other agencies responsible for specific activities. There are four homeowner associations that will be contacted at least annually to be kept informed of Preserve activities.

The County has an agreement with the Division of Forestry to assist with containment in the event that a wildfire occurs. Initial fire responses are the responsibility of the Sarasota County Emergency Services in coordination with the designated land manager.

Annual records of listed species occurrence shall be provided to the Florida Natural Areas Inventory.

The Florida Department of Environmental Protection has an annual grant program to fund the initial strike of nuisance exotic species: the Suncoast Exotic Species Treatment Grant. The granting entity simply requires an estimate of acreage, species, proportion of acreage, and estimated cost.

LAND USE COMPONENT

Land Use History, Adjacent Land Uses

Historically, the area was logged and was subject to relatively open range cattle grazing. The Slough was channelized historically for navigation and to increase flow efficiency. It was later widened and deepened to assist with localized stormwater control as a result of, and subsequent to Hurricane Donna (See Addendum B. Habitat Trend Analysis for details).

Existing Uses and Facilities (See Figure 7)

The County has constructed limited nature-based recreational infrastructure at the Preserve to provide access to the community, and fencing around the perimeter. At the main entrance along Beneva Road, there is currently a shell parking area, picnic and playground facilities, informational kiosks, butterfly gardens, and hiking trailheads. Scenic fitness and hiking trails traverse the site, with benches located adjacent to the waterway. Future consideration may be given to the development of a loop trail for neighborhood visitor access to the site.

Monitoring Wells

The Intermediate Aquifer System is an important aspect of ground water resource management in Sarasota County. Sustainability of this resource is of utmost importance to area residents who depend on water from the upper two permeable zones for domestic supply, landscape irrigation, and agricultural supply. Expansion of the Intermediate Aquifer monitoring network will help insure protection of this valuable water resource.

In June 2004, Sarasota County authorized the installation of 3 Intermediate Aquifer monitoring wells which will be part of a County-wide monitoring program (See

Appendix H). The project was co-funded by the Southwest Florida Water Management District who provided technical oversight during well installation. Wells were installed at depths of 5 feet (Surficial Aquifer), 110 feet (Intermediate Aquifer – Permeable Zone 2) and 300 feet (Intermediate Aquifer – Permeable Zone 3) (See Appendix H for technical drawings). The wells are located just north of the Beneva Road entrance and parking lot (See Appendix H for current photo of site).

Monitoring of ground water levels and ground water quality in the Intermediate Aquifer System at Red Bug Slough supports the objectives of the Board of County Commissioners' Strategic Initiative, "Water Resources Management," by ensuring the quality and quantity of the County's ground water resource and the integrity of associated natural systems. These data will allow Sarasota County to optimize water use and supply sustainability and to remain proactive and preventative in the maintenance of the County's ground water resources.

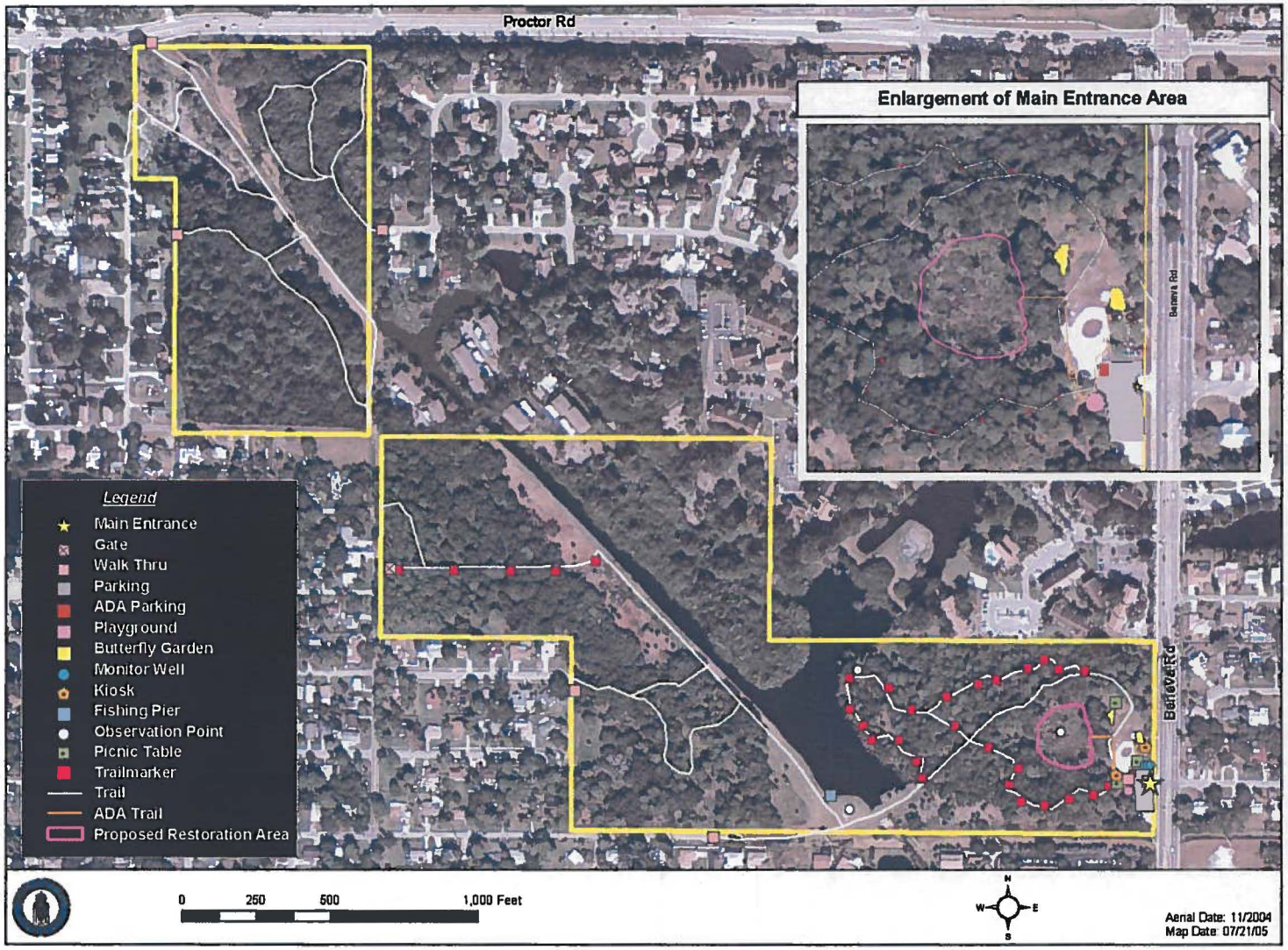

Figure 7: Red Bug Slough, Existing Infrastructure

Proposed Land Use Plan (recreational opportunities)

Educational displays are planned to be installed at key observation points to describe habitats present and associated wildlife that frequent the site. In addition, Sarasota County is in the process of partnering with the Florida Fish and Wildlife Conservation Commission to include Red Bug Slough Preserve as an Urban Fisheries Project site. As part of this program, an ADA accessible fishing dock/observation deck and a pedestrian bridge across the slough are planned to improve access for fishing. In addition, a separate project is slated to restore wetland hydrology in the hydric hammock and add a boardwalk into the hammock to provide access and public educational opportunities. All improvements will be sited to minimize impacts to the natural resources on site.

Visitor Use Management Recommendations

The Red Bug Slough Preserve is situated in a suburban landscape and receives substantial usage by neighbors and visitors and organizations from the community. The following methods can assist in evaluating the numbers and impacts from visitors.

- Voluntary registration and comment forms will be placed at main access entrances along with collection boxes. These forms will document the monthly level of usage of the provided parking areas, trails, observation area, and interpretive facilities. In addition, these forms will solicit public input on evaluating all provided recreational improvement.

- The Florida House Institute for Sustainable Development and Sarasota County Community Services staff that utilize provided recreational facilities at the Red Bug Slough Preserve would provide annual comprehensive evaluations. In addition, registration and evaluation forms will be collected from the public participants as the programs occur.

- All scheduled plant and wildlife surveys of the Red Bug Slough Preserve will include inspections for deterioration of all provided facilities and fencing that are proximal to the survey areas.

- Three or more volunteers will be recruited from the neighborhoods near the Red Bug Slough Preserve. These individuals will be trained to complete comprehensive questionnaires about all provided recreational facilities and fencing.

Monitoring Use Methodology

Considering the use and access proposed for the Preserve, public use analysis is not applicable (N/A) at this time.

OPERATIONS COMPONENT

Administration

The County, specifically Sarasota County Natural Resources and Parks and Recreation, are responsible for all aspects of Red Bug Slough Preserve's management and operation.

Staffing Recommendations

The County has assigned one land manager that is responsible for the Preserve. This manager shall visit the site quarterly and write an annual report that assesses at a minimum:

- Actions that have occurred on site
- Consistency of site management with the land management plan
- Results of floral and faunal monitoring
- Listed species element occurrence records
- Updates to the GIS-based land management data base for the site
- All operational findings from monthly site visits

County staff shall visit the site monthly to assure that the site is properly secured and that only authorized land uses are occurring.

Facilities

Maintenance of facilities on the site will be coordinated by Sarasota County Parks and Recreation. Staff of Sarasota County Parks and Recreation provide trash removal, mowing, and general upkeep of the facilities. Sarasota County Public Works, Stormwater Management, provides any maintenance necessary to the control structures at within Red Bug Slough and the lake. In addition to County staff, volunteers will be enlisted to maintain the trails.

Resource Management Operations

The preserve's designated land manager will visit the site weekly. The manager shall:

- Identify any encroachment/security issues.
- Assess the overall natural condition of the site.
- Document species occurrences.
- Evaluate local development and mitigation needs to determine whether enhancement funds may be available for the "first strike" exotic species removal of the site's most densely concentrated areas of nuisance exotic species.
- Look to other granting entities (DEP Suncoast Grant) for exotic species removal funding.

Periodically, the land manager will locate using GPS the general distribution and type of nuisance exotic species for the purpose of establishing a phased approach of nuisance exotic species control. Control, as used here, is to identify new nuisance exotic species, prevent the spread of these species as well as existing nuisance exotic species, and reduce the existing nuisance exotic populations.

Coarse filter vegetative and wildlife surveys are recommended upon the adoption of this management plan and with each update to the plan in order to track progress in meeting management goals and objectives. The surveys shall follow the methods adopted with the "Survey Protocol for Master Land Management Plan."

Upon return from all site visits, the species occurrence database shall be updated and a brief site visit summary sheet shall be filled out documenting the above parameters. Any findings of special interest shall be documented and addressed in the annual report. The annual report shall summarize the findings of the four quarterly site visits and any documentation of interest on the operations and maintenance site visits. The annual report shall also track management progress as it relates to the time lines presented in this five-year plan.

Security and Maintenance

Both Resource Management and Parks and Recreation staff will be visible on the Preserve and will keep the public informed of the County ordinances governing appropriate behavior and the operating hours for this type of park. The visibility of County staff can help prevent vandalism. To augment these security measures, signage of the rules and regulations are posted at the public access entrance and a perimeter fence has been installed. These facilities will be maintained. The Sarasota County Sheriff's Department will be responsible for providing regular patrols and enforcing trespass ordinances.

Estimated Management and Visitor Use Budgets

Recurring Annual Costs

1) 120 man hours for the lead land manager (6 hrs/site visit and 8 hrs for reporting and misc.)
   = $3,588.00 (@$23/hr w/ 30% overhead)

2) Mowing and misc. maintenance: 288 man hours for the park attendant to check on park infrastructure (24 hours/month x 12 months @$12/hr.).
   = $3456.00

3) Exotic Species Removal: Eighteen labor days annually plus chemical costs (includes contractors)
   = $6000 (Six days of with contractors @ $1,000/day)

= $2,246.40 (12 days or 96 hours @ $18/hr w/ %30 overhead)
= $1,000 (herbicide costs)
= $ 9,246.40

4) Posting Signage
= $100.00/yr.

5) Other Direct Expenses
$2,500/yr for infrastructure upkeep
$200/yr. for travel.
$1,700/yr.

$ 17790.40 per year

Additional Tasks Year 1:

1) Course Filter Surveys
104 hours for botanist (24)/wildlife biologist (80) (see monitoring protocol costs) plus direct expenses (travel plus materials) = (104 x $26.91) + (90 [3 monitoring stations @ $30/station] + $150 [travel])
= $3038.64

Total for Year 1: $22,129.04

Proposed Management Schedule
(See Table 1.)

Task	2005												2006												2007											
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Exotic Species Removal																																				
Land Manager's site visit (once per week)																																				
Operation site visit (once per month)																																				
Course Filter Surveys																																				
Annual Report																																				

Task	2008												2009											
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Exotic Species Removal																								
Land Manager's site visit (once per quarter)																								
Operation site visit (once per month)																								
Annual Report																								

Table 1. Proposed Management Plan Schedule (5 years)

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ADDENDUM A.
RED BUG SLOUGH PRESERVE HABITAT TREND ANALYSIS
(In progress)

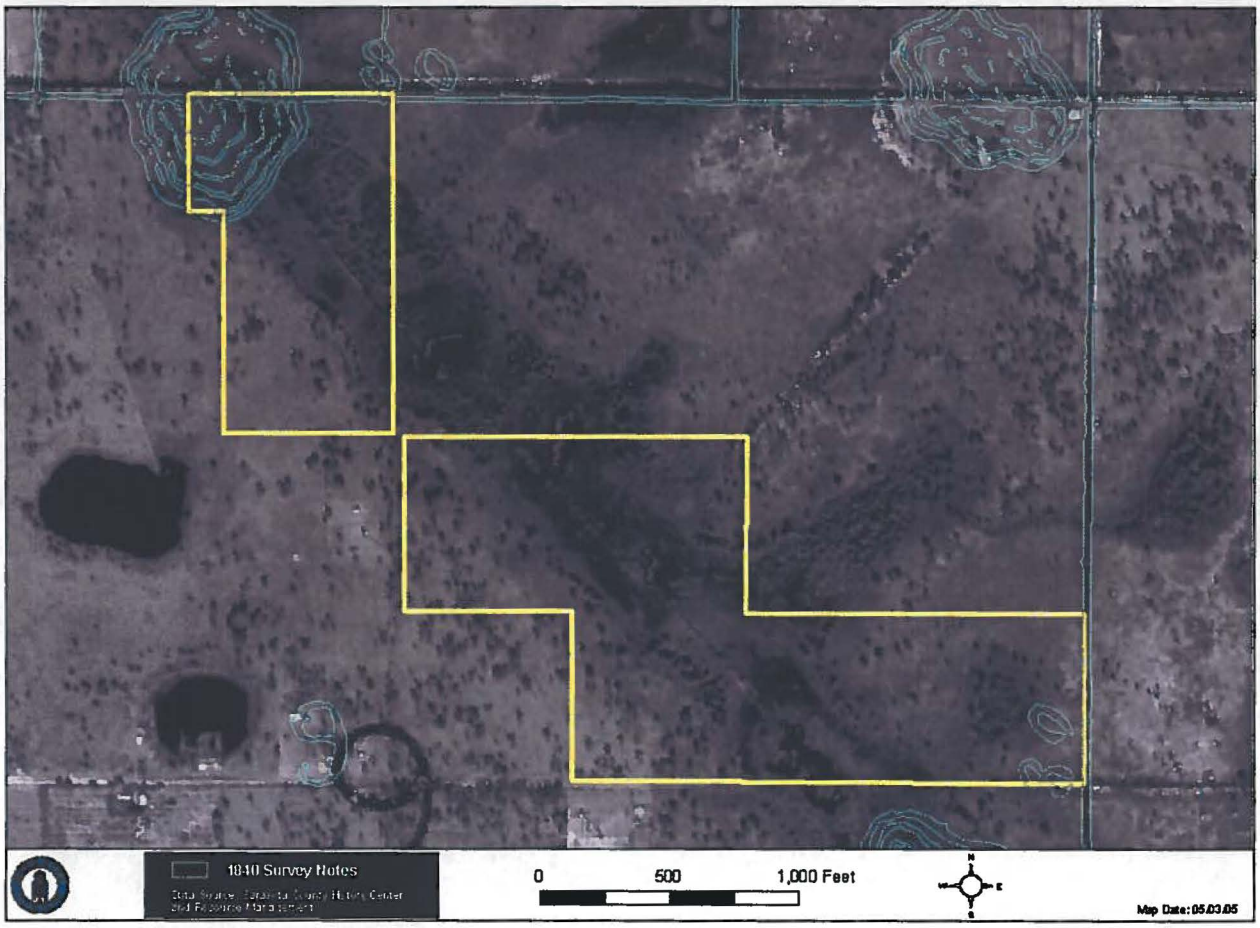

Figure A-1: Red Bug Slough Preserve, 1948 Site Photograph with 1840 Survey Notes

ADDENDUM B.
RELEVANT COUNTY COMPREHENSIVE PLAN ORDINANCES

Key Comprehensive Plan Directives

The County will enhance and protect the 72-acre parcel and maintain a natural preserve in furtherance of the County's Comprehensive Plan as proposed in the original FCT application. Acquisition of the project site furthers the goals, objectives and policies of the Sarasota County Comprehensive Plan including Recreation and Open Space, Future Land Use, and Environment by:

- Restoring and enhancing native plant communities
- Protecting threatened and endangered species
- Providing additional open space and outdoor recreational opportunities
- Protecting water quality

The key comprehensive plan directives addressed are summarized and numerically cited with the following:

1) Provision of Acreage or Outdoors Recreational Facilities Necessary to Maintain or Improve Levels of Service Standards
    - Objective 1.1 and Policies 1.1.2 and 1.1.3 of the RECREATION AND OPEN SPACE CHAPTER of the APOXSEE

2) Acquisition of Natural Areas or Open Space Through Public Acquisition
    - Objective 1.1 and Policy 1.1.7 of the FUTURE LAND USE CHAPER of the APOXSEE
    - Policy 1.1.9 of the RECREATION AND OPEN SPACE CHAPTER of the APOXSEE

3) Provision of New or Enhanced Public Access to Water Bodies and Saltwater Beaches
    - Policy 1.1.7 of the RECREATION AND OPEN SPACE CHAPTER of the APOXSEE
    - Policy 1.3.3 of the ENVIRONMENT CHAPTER of the APOXSEE

4) Provision for Comprehensive Plan Directives that Provide for New or Enhanced Greenways or Recreational Trail Systems
    - Policy 5.5.3 of the ENVIRONMENT CHAPTER of the APOXSEE

5) Preservation of Natural Communities or Listed Animal Species Habitat
    - Objective 5.4 and 5.5 of the ENVIRONMENT CHAPTER of the APOXSEE

6) Provision of Coordination Among Federal, State, and Local Agencies of Nonprofit Organizations Acquiring or Managing Natural Areas or Open Space for Outdoor Recreation

- Policies 5.4.2, 5.5.3, and 5.6.7 of the ENVIRONMENT CHAPTER of the APOXSEE
- Objective 1.5 of the RECREATION AND OPEN SPACE CHAPTER of the APOXSEE

7) Restoration or Enhancement of Degraded Natural Areas
   - Policy 5.6.5 of the ENVIRONMENT CHAPTER of the APOXSEE
   - Policy 1.2.3 of the RECREATION AND OPEN SPACE CHAPTER of the APOXSEE

8) Protection or Enhancement of Surface or Groundwater Quality
   - Objective 5.3 of the ENVIRONMENT CHAPTER of the APOXSEE

9) Direction of Development to a Locally Designated Urban Infill, Urban Redevelopment or Downtown Revitalization Acre
   - Policies 3.2.2 and 4.1.2 of the FUTURE LAND USE CHAPTER of the APOXSEE

The project site will be managed only for the conservation, protection and enhancement of natural resources, and for public outdoor recreation that is compatible with the conservation, protection and enhancement of the project site. Scientific research, environmental education, and nature-based recreation will be encouraged as long as they do not jeopardize the protection of natural resources. For a more detailed schedule of management goals see the Site Improvement Schedule.

The project site will be identified in all literature, park entrance signage, and advertising as being publicly owned and operated as a natural conservation, outdoor recreation area that was acquired with funds from the Florida Communities Trust and Sarasota County. The entrance sign will be at least 2' x 3' in size and include the FCT logo and the year of acquisition.

The current land use designation is moderate density residential. During the next year, Sarasota County's Growth Management and Natural Resources staff will amend the zoning designation to conservation by requesting an amendment to the Future Land Use Map to identify the project site as Public Conservation/Preservation. The procedure to amend the future land use map will include approval by the Sarasota County Board of County Commissioners. The proposed amendment will be submitted to the Department of Community Affairs for review and approval.

ADDENDUM C.
VEGETATION AT RED BUG SLOUGH PRESERVE

Table C-1. Red Bug Slough Preserve. Vegetation Documented onsite.

List of Plant Species

FAMILY	SCIENTIFIC NAME	COMMON NAME(S)
ACERACEAE	*Acer rubrum*	red maple
AGAVACEAE	**Yucca aloifolia*	Spanish bayonnet
ALISMATACEAE	*Sagittaria lancifolia*	bulltongue arrowhead
ANACARDIACEAE	*Rhus copallina*	winged sumac; shining sumac
ANACARDIACEAE	**Schinus terebinthifolius*	Brazilian pepper tree
ANACARDIACEAE	*Toxicodendron radicans*	poison ivy
ANNONACEAE	*Asimina* sp.	pawpaw
AQUIFOLIACEAE	*Ilex glabra*	gallberry
ARACEAE	**Epipremnum pinnatum*	golden pothos
ARACEAE	**Pistia stratiotes*	water-lettuce
ARACEAE	**Syngonium podophyllum*	American evergreen; arrowhead vine
ARALIACEAE	**Schefflera actinophylla*	schefflera; Australian umbrella tree
ARECACEAE	*Sabal palmetto*	cabbage palm; sabal palm
ARECACEAE	*Serenoa repens*	saw palmetto
ASTERACEAE	*Ageratina jacunda*	hammock snakeroot
ASTERACEAE	*Ambrosia artemisiifolia*	common ragweed
ASTERACEAE	*Baccharis halimifolia*	saltbush; salt myrtle
ASTERACEAE	*Bidens alba* var. *radiata*	Spanish needles
ASTERACEAE	*Conyza canadensis*	dwarf horseweed
ASTERACEAE	*Erechtites hieracifolia*	fireweed
ASTERACEAE	*Eupatorium capillifolium*	dog fennel
ASTERACEAE	*Euthamia minor*	flat-topped goldenrod
ASTERACEAE	*Hieracium megacephalon*	coastalplain hawkweed
ASTERACEAE	*Pluchea rosea*	camphorweed
ASTERACEAE	*Pterocaulon pycnostachyum*	blackroot
ASTERACEAE	**Sphagneticola trilobata*	wedelia; creeping oxeye
ASTERACEAE	*Verbesina virginica*	frostweed; crownbeard

BLECHNACEAE	*Blechnum serrulatum*	swamp fern
BLECHNACEAE	*Woodwardia virginica*	Virginia chain fern
BROMELIACEAE	*Tillandsia recurvata*	ball moss
BROMELIACEAE	*Tillandsia usneoides*	Spanish moss
CANNACEAE	*Canna flaccida*	yellow canna
CAPRIFOLIACEAE	*Sambucus canadensis*	elderberry
CAPRIFOLIACEAE	*Viburnum obovatum*	Walter's viburnum; small-leaf viburnum
CHRYSOBALANACEAE	*Licania michauxii*	gopher apple
CLUSIACEAE	*Hypericum tetrapetalum*	fourpetal St. John's-wort
CONVOLVULACEAE	*Ipomoea alba*	moonflowers; tropical white Morningglory
CUPRESSACEAE	*Juniperus virginiana*	red cedar
CYPERACEAE	*Cladium jamaicensis*	sawgrass
CYPERACEAE	**Cyperus involucratus*	umbrella plant
CYPERACEAE	*Rhynchospora colorata*	starrush whitetop
DENNSTAEDTIACEAE	*Pteridium aquilinum*	bracken fern
DIOSCOREACEAE	**Dioscorea bulbifera*	air potato; devil's potato
ERICACEAE	*Lyonia lucida*	fetterbush
FABACEAE	**Abrus precatorius*	rosary pea
FABACEAE	*Chamaecrista fasciculata*	partridge pea
FABACEAE	*Chamaecrista nictitans*	partridge pea
FABACEAE	*Desmodium* sp.	beggar's ticks
FABACEAE	*Erythrina herbacea*	eastern coralbean; Cherokee bean
FABACEAE	*Indigofera hirsuta*	hairy indigo
FAGACEAE	*Quercus laurifolia*	laurel oak
FAGACEAE	*Quercus nigra*	water oak
FAGACEAE	*Quercus virginiana*	live oak
LILIACEAE	**Asparagus densiflorus*	Sprenger's asparagus-fern
MAGNOLIACEAE	*Magnolia virginiana*	sweetbay
MALVACEAE	**Urena lobata*	Caesar-weed
MYRICACEAE	*Myrica cerifera*	wax myrtle

MYRTACEAE	*Melaleuca quinquenervia	melaleuca; punk tree; paperbark tree
NEPHROLEPIDACEAE	*Nephrolepis cordifolia	tuberous sword fern
OLACACEAE	*Ximenia americana*	tallow wood; hog plum
ONAGRACEAE	*Ludwigia peruviana	ludwigia
ORCHIDACEAE	*Habenaria odontopetala*	rein orchid
OSMUNDACEAE	*Osmunda cinnamomea* C (FDA)	cinnamon fern
OSMUNDACEAE	*Osmunda regalis* C (FDA)	royal fern
OXALIDACEAE	*Oxalis corniculata*	common yellow woodsorrel; creeping woodsorrel
PHYTOLACCACEAE	*Phytolacca americana*	pokeweed; pokeberry
PINACEAE	*Pinus elliottii* var. *densa*	south Florida slash pine
POACEAE	*Dichanthelium* sp.	witchgrass
POACEAE	*Eustachys petraea*	pinewoods fingergrass
POACEAE	*Panicum maximum	guinea grass
POACEAE	*Paspalum notatum	bahiagrass
POACEAE	*Setaria parviflora*	yellow bristlegrass; knotroot foxtail
POACEAE	*Sporobolus indicus	smutgrass
POLYGONACEAE	*Polygonum* sp.	smartweed
POLYPODIACEAE	*Phlebodium aureum*	golden polypody; serpent fern
PROTEACEAE	* *Grevillea robusta*	silkoak
ROSACEAE	*Rubus* sp.	blackberry

RUBIACEAE	*Cephalanthus occidentalis*	buttonbush
RUBIACEAE	*Psychotria sulzneri*	wild coffee
SALICACEAE	*Salix caroliniana*	Carolina willow; Coastal plain willow
SAPINDACEAE	**Cupaniopsis anacardioides*	carrotwood
SCROPHULARIACEAE	*Scoparia dulcis*	sweet broom
SMILACACEAE	*Smilax* sp.	greenbriar; catbriar
SOLANACEAE	*Physalis* sp.	groundcherry
THEACEAE	*Gordonia lasianthus*	loblolly bay
THELYPTERIDACEAE	*Thelypteris* sp.	maiden fern
TYPHACEAE	*Typha* sp.	cattail
VERBENACEAE	*Callicarpa americana*	beautyberry; beautybush
VERBENACEAE	**Lantana camara*	lantana
VERBENACEAE	*Phyla nodiflora*	turkey tangle fogfruit; capeweed
VITACEAE	*Ampelopsis arborea*	pepper vine
VITACEAE	*Parthenocissus quinquefolia*	Virginia creeper
VITACEAE	*Vitis munsoniana*	southern fox grape; muscadine grape

LEGEND

* = non-native species

FLORIDA DEPARTMENT OF AGRICULTURE (FDA) DESIGNATIONS
C = commercially exploited

Compiled by J. Weber
Updated 06/20/05

ADDENDUM D. WILDLIFE AT RED BUG SLOUGH PRESERVE

Table D-1. Red Bug Slough Preserve. Potential Wildlife Utilization: Amphibians and Reptiles

Common Name	*Scientific Name*[1]	Habitat[2]				
		Mesic Hammock	Pine Flatwoods	Hyd. Ham./ Swamp	Red Bug Slough	Marsh/ Ditch
Oak Toad	*Bufo quercicus*	X	X	X		X
Southern Toad	*Bufo terrestris*	X	X	X		X
Florida Cricket Frog	*Acris gryllus dorsalis*			X		X
Green Treefrog	*Hyla cinerea*	X	X	X	X	X
Squirrel Treefrog	*Hyla squirella*	X	X	X	X	X
Cuban Treefrog - Ex.	*Osteopilus septentrionalis*	X	X	X	X	X
Little Grass Frog	*Limnaoedus ocularis*			X	X	X
Florida Chorus Frog	*Pseudacris nigrita verrucosa*			X	X	X
Eastern Narrowmouth Toad	*Gastrophryne carolinensis carolinensis*	X	X	X		
Bullfrog	*Rana catesbeiana*			X	X	X
Pig Frog	*Rana grylio*			X	X	X
Southern Leopard Frog	*Rana utricularia*			X	X	X
Marine Toad - Ex.	*Bufo marinus*	X		X	X	X
Two-toed Amphiuma	*Amphiuma means*			X	X	X
Peninsula Newt	*Notopthalmus viridescens piaropicola*	X		X		
Greenhouse Frog - Ex.	*Eleutherodactylus planirostris planirostris*	X		X		X
American Alligator	*Alligator mississippiensis*			X	X	X
Eastern glass Lizard	*Opisaurus ventralis*	X	X			X
Southeastern Five-lined Skink	*Eumeces inexpectatus*	X	X	X		
Ground Skink	*Scincella lateralis*	X	X	X		
Green Anole	*Anolis carolinensis*	X	X	X		
Cuban Anole	*Anolis sagrei*	X	X	X		
Florida Box Turtle	*Terrapene carolina bauri*	X	X			
Striped Mud Turtle	*Kinosternon baurii*	X	X	X		
Florida Mud Turtle	*Kinosternon subrubrum steindachneri*	X	X	X		

Table D-1. Red Bug Slough Preserve. Potential Wildlife Utilization: Amphibians and Reptiles

Common Name	*Scientific Name*[1]	Habitat[2]				
		Mesic Hammock	Pine Flatwoods	Hyd. Ham./ Swamp	Red Bug Slough	Marsh/ Ditch
Stinkpot	*Sternotherus odoratus*			X		
Florida Snapping Turtle	*Chelydra serpentina osceola*			X	X	X
Florida Softshell	*Apalone ferox*			X	X	X
Red-eared Slider - Ex.	*Pseudomys scripta elegans*				X	X
Peninsular Cooter	*Chrysomeys floridana peniinsularis*				X	X
Florida Red-bellied Turtle	*Chrysemys nelsoni*				X	
Southern Black Racer	*Coluber constrictor priapus*	X	X	X		
Southern Ringneck Snake	*Diadophis punctatus punctatus*	X	X	X		
Corn Snake	*Elaphe guttata guttata*	X	X	X		
Yellow Rat Snake	*Elaphe obsoleta quadrivittata*	X	X	X		
Eastern Mud Snake	*Farancia abacura abacura*			X	X	X
Common Kingsnake	*Lampropeltis getulus*				X	X
Scarlet Kingsnake	*Lampropeltis triangulum elapsoides*	X	X	X		
Florida Green Water Snake	*Nerodia floridana*			X	X	X
Florida Water Snake	*Nerodia fasciata pictiventris*				X	X
Brown Water Snake	*Nerodia taxispilota*			X	X	X
Rough Green Snake	*Opheodrys aestivus*			X	X	X
Striped Crayfish Snake	*Regina alleni*			X	X	X
South Florida Swamp Snake	*Seminatrix pygaea cyclas*			X	X	X
Florida Brown Snake	*Storeria dekayi victa*			X	X	X
Peninsula Ribbon Snake	*Thamnophis sauritus sackenii*		X		X	X
Eastern Garter Snake	*Thamnophis sirtalis sirtalis*	X	X	X	X	X
Florida Cottonmouth	*Agkistrodon piscivorus conanti*			X	X	X
Eastern Indigo Snake - P	*Drymorchon corais couperi*	X		X		
Eastern Coral Snake	*Nicrurus fulvius fulvius*	X		X		
Eastern Diamondback Rattlesnake	*Crotalus adamanteus*	X				

[1] Collins, J.T., R. Conant, J.E. Huheey, J.L. Knight, E.M. Rundquist, and H.M. Smith, 1982. Standard common and current scientific names for North American amphibians and reptiles.

RED BUG SLOUGH PRESERVE

Table D-2. ~~Manning Preserve.~~ Potential Wildlife Utilization: Birds.

Common Name[1]	*Scientific Name*	Season[2]	Habitats				
			Mesic Hammock	Pine Flatwoods	Hyd. Ham/ Swamp	Red Bug Slough	Marsh/ Ditch
Double-crested Cormorant	*Phalacrocorax auritus*	y			X	X	X
Anhinga	*Anhinga anhinga*	y			X	X	X
Great Blue Heron	*Ardea herodias*	y			X	X	X
Great Egret	*Casmerodius albus*	y			X	X	X
Snowy Egret - P	*Egretta thula*	y			X	X	X
Cattle Egret	*Bubulcus ibis*	y			X	X	X
Tricolored Heron - P	*Egretta tricolor*	y			X	X	X
Little Blue Heron - P	*Egretta caerulea*	y			X	X	X
Green Heron	*Butorides striatus*	y			X	X	X
Black-crowned Night-Heron - P	*Nycticorax nycticorax*	y			X	X	X
Yellow-crowned Night-Heron - P	*Nycticorax violacus*	y			X	X	X
Limpkin - P	*Aramus guarauna*	y			X	X	X
Wood Stork - P	*Mycteria americana*	y			X	X	X
White Ibis - P	*Eudocimus albus*	y			X	X	X
Glossy Ibis	*Plegadis falcinellus*	y			X	X	X
Black-bellied Whistling Duck	*Dendrocygna autumnalis*	y				X	
Wood Duck	*Aix sponsa*	y			X	X	X
Muscovy Duck	*Cairina moschata*	y				X	
Mallard	*Anas platyrhynchos*	y				X	X
Mottled Duck	*Anas fulvigula*	y				X	
Green-winged Teal	*Anas crecca*	w				X	
Blue-winged Teal	*Anas discors*	w				X	
Lesser Scaup	*Aythya affinis*	w				X	X
Hooded Merganser	*Lophodytes cucullatus*	w				X	X
Black Vulture	*Coragyps atratus*	y	X	X	X		
Turkey Vulture	*Cathartes aura*	y	X	X	X		
Bald Eagle - P	*Haliaeetus leucocephalus*	y		X	X	X	X
Cooper's Hawk	*Accipiter cooperii*	y	X	X		X	X

RED BUG SLOUGH

Table D-2. ~~Manning~~ Preserve. Potential Wildlife Utilization: Birds.

Common Name[1]	*Scientific Name*	Season[2]	Habitats				
			Mesic Hammock	Pine Flatwoods	Hyd. Ham/ Swamp	Red Bug Slough	Marsh/ Ditch
Sharp-shinned Hawk	*Accipiter striatus*	w	X	X			X
Red-tailed Hawk	*Buteo jamaicensis*	y	X	X	X		X
Red-shouldered Hawk	*Buteo lineatus*	y	X	X	X		X
Northern Bobwhite	*Colinus virginianus*	y	X	X	X		
King Rail	*Rallus elegans*	y					X
Virginia Rail	*Rallus limicola*	w					X
Common Moorhen	*Gallinula chloropus*	y			X	X	X
American Coot	*Fulica americana*	w			X		X
Killdeer	*Charadrius vociferus*	y					X
Black-necked Stilt	*Himantopus mexicanus*	y				X	X
Greater Yellowlegs	*Tringa melanoleuca*	w				X	X
Spotted Sandpiper	*Actitis macularia*	w				X	X
Least Sandpiper	*Calidris minutilla*	w				X	X
Common Snipe	*Gallinago gallinago*	w		X		X	X
American Woodcock	*Scolopax minor*	w	X	X			
Ring-billed Gull	*Larus delawarensis*	w				X	
Herring Gull	*Larus argentalus*	w				X	
Laughing Gull	*Larus atricilla*	y				X	
Forster's Tern	*Sterna forsteri*	w				X	
Least Tern	*Sterna antillarum*	s				X	
Mourning Dove	*Zenaida macroura*	y	X	X	X		
Common Ground-dove	*Columbina passerina*	y	X	X			
Monk Parakeet - Ex	*Myiopsitta monachus*	y	X	X			
Yellow-billed Cuckoo	*Coccyzus americanus*	s	X	X	X		
Eastern Screech-Owl	*Otus asio*	y	X	X	X		
Great Horned Owl	*Bubo virginianus*	y	X	X	X		

RED BUG SLOUGH

Table D-2. ~~Manning~~ Preserve. Potential Wildlife Utilization: Birds.

Common Name[1]	*Scientific Name*	Season[2]	Habitats				
			Mesic Hammock	Pine Flatwoods	Hyd. Ham/ Swamp	Red Bug Slough	Marsh/ Ditch
Barred Owl	*Stix varia*	y	X	X	X		
Whip-poor-will	*Caprimulgus vociferus*	w	X	X			
Chuck-will's Widow	*Caprimulgus carolinensis*	y	X	X			
Common Nighthawk	*Chordeiles minor*	s	X	X	X	X	X
Chimney Swift	*Chaetura pelagica*	s		X		X	X
Ruby-throated Hummingbird	*Archilochus colubris*	s	X	X		X	
Belted Kingfisher	*Ceryle alcyon*	w				X	X
Pileated Woodpecker	*Dryocopus pileatus*	y	X	X	X		
Northern Flicker	*Colaptes auratus*	y	X	X	X		
Red-bellied Woodpecker	*Melanerpes carolinus*	y	X	X	X		
Yellow-bellied Sapsucker	*Sphyrapicus varius*	w	X	X	X		
Hairy Woodpecker	*Picoides villosus*	y	X	X	X		
Downy Woodpecker	*Picoides pubescens*	y	X	X	X		
Great Crested Flycatcher	*Myiarchus crinitus*	y	X	X	X		
Eastern Kingbird	*Tyrannus tyrannus*	s	X	X			X
Eastern Phoebe	*Sayornis phoebe*	w		X		X	X
Barn Swallow	*Hirundo rustica*	y		X		X	X
Tree Swallow	*Tachycineta bicolor*	w		X		X	X
Purple Martin	*Progne subis*	w		X		X	X
Blue Jay	*Cyanocitta cristata*	y	X	X	X		
Fish Crow	*Corvus ossifragus*	y			X	X	
American Crow	*Corvus brachyrhynchos*	y	X	X	X	X	
Tufted Titmouse	*Parus bicolor*	y	X	X	X		
Carolina Chickadee	*Parus carolinensis*	y	X	X	X		
Brown Thrasher	*Toxostoma rufum*	y	X	X			
Northern Mockingbird	*Mimus polyglottos*	y	X	X	X		
Gray Catbird	*Dumetella carolinensis*	w	X	X	X		
House Wren	*Troglodytes aedon*	w	X	X	X		
Carolina Wren	*Thryothorus ludovicianus*	y	X	X	X		
Hermit Thrush	*Catharus guttatus*	w	X	X			
American Robin	*Turdus migratorius*	w	X	X	X		
Ruby-crowned Kinglet	*Regulus calendula*	w	X	X	X		
Blue-gray Gnatcatcher	*Polioptila caerulea*	y	X	X	X		
Loggerhead Shrike	*Lanius ludovicianus*	y	X	X			
Cedar Waxwing	*Bombycilla cedrorum*	w	X	X	X		
Blue-headed Vireo	*Vireo solitarius*	w	X	X	X		

RED BUG SLOUGH

Table D-2. ~~Manning~~ Preserve. Potential Wildlife Utilization: Birds.

Common Name[1]	*Scientific Name*	Season[2]	Habitats				
			Mesic Hammock	Pine Flatwoods	Hyd. Ham/ Swamp	Red Bug Slough	Marsh/ Ditch
Yellow-throated Vireo	*Vireo flavifrons*	s	X	X	X		
Red-eyed Vireo	*Vireo olivaceus*	s	X	X	X		
White-eyed Vireo	*Vireo griseus*	y	X	X	X		
Black-and-white Warbler	*Mniotilta varia*	w	X	X	X		
Yellow-rumped Warbler	*Dendroica coronata*	w	X	X	X		
Northern Parula	*Parula americana*	s	X	X	X		
Yellow-throated Warbler	*Dendroica dominica*	s	X	X	X		
Palm Warbler	*Dendroica palmarum*	w		X	X		
Pine Warbler	*Dendroica pinus*	y	X	X			
Common Yellowthroat	*Geothlypis trichas*	y		X	X	X	X
Ovenbird	*Seiurus aurocapillus*	w	X	X	X		
American Redstart	*Setophaga ruticilla*	w	X	X	X		
Boat-tailed Grackle	*Quiscalus major*	y	X	X	X	X	X
Brown-headed Cowbird	*Molothrus alter*	y					X
Common Grackle	*Quiscalus quiscula*	y	X	X			X
Summer Tanager	*Piranga rubra*	s	X	X			
Northern Cardinal	*Cardinalis cardinalis*	y	X	X	X		
American Goldfinch	*Carduelis tristis*	w			X		
White-throated Sparrow	*Zonotrichia albicollis*	w	X	X			
Swamp Sparrow	*Melospiza georgiana*	w	X	X			

[1]Source of scientific and common names: Robertson, Jr., W.B., G.E. Woolfenden. 1992. Florida bird species: an annotated list. Florida Ornithological Society. Pub. No. 6. Gainesville, FL

[2] y = year round resident; s = summer migrant; w = winter migrant.

Table D-3. Red Bug Slough Preserve. Potential Wildlife Utilization: Mammals.

COMMON NAME	SCIENTIFIC NAME[1]	Mesic Hammock	Pine Flatwoods
Virginia Opossum	*Didelphis virginiana*	X	X
Southeastern Shrew	*Sorex longirostris*	X	X
Southern Short-tailed Shrew	*Blarina carolinensis*	X	X
Eastern Mole	*Scalopus aquaticus*	X	X
Southeastern Myotis	*Myotis austroriparius*	X	X
Eastern Red Bat	*Lasiurus borealis*	X	X
Seminole Bat	*Lasiurus seminolus*	X	X
Eastern Pipistrel	*Pipistrellus subflavus*	X	X
Big Brown Bat	*Eptesicus fuscus*	X	X
Evening Bat	*Nycticeius humeralis*	X	X
Northern Yellow Bat	*Lasiurus intermedius*	X	X
Brazilian Free-tailed Bat	*Tadarida brasiliensis*	X	X
Raccoon	*Procyon lotor*	X	X
River Otter	*Lutra canadensis*		
Spotted Skunk	*Spilogale putorius*		X
Striped Skunk	*Mephitis mephitis*		X
Bobcat	*Lynx rufus*	X	X
Sherman's Fox Squirrel - P	*Sciurus niger shermanii*	X	X
Gray Squirrel	*Sciurus carolinensis*	X	X
Southern Flying Squirrel	*Glaucomys volans*	X	X
Cotton Mouse	*Peromyscus gossypinus*	X	X
Golden Mouse	*Ochrotomys nuttalli*	X	X
Eastern Woodrat	*Neotoma floridana*	X	X
Hispid Cotton Rat	*Sigmodon hispidus*	X	X
Eastern Cottontail	*Sylvilagus floridanus*	X	X
Nine-banded Armadillo	*Dasypus novemcinctus*	X	X

[1] Source of scientific and common names: Jones Jr., J.K., R.S. Hoffman, D.W. Rice, C.Jones, R.J. Baker, and M.D. Engstrom. 1992. Revised Checklist of North American mammals north of Mexico, 1991. Occ. Papers Mus. Texas Tech. Univ. No. 146:1-23. Lubbock, Tex.

ADDENDUM E
NUISANCE EXOTIC SPECIES ERADICATION TECHNIQUES
PLANTS

The Florida *Exotic* Pest Plant Council[1] has developed a list of Florida's Most *Invasive* Species (see back of Appendix G). The purpose of this list is to focus attention on the impacts that these plants have on our *native* ecosystem's biological diversity and function.

Definitions:

Exotic (as used here) – a non-indigenous species, or one introduced to this state, either purposefully or accidentally; it then escaped into the wild in Florida where it reproduces on its own either sexually or asexually.

Invasive (as used here) – is a variable condition defined by the category to which the species is defined:

- Category I – Species that are invading and disrupting native plant communities in Florida
- Category II – Species that have shown a potential to disrupt native plant communities. *These species may become ranked Category I, if ecological damage is demonstrated.*

Category I Species:

Site management will concentrate on eradicating Category I species. Control plans for Category I species that are known or likely to occur on site follow. The herbicides recommended below have shown very low toxicity to wildlife.

Brazilian Pepper (*Schinus terebinthifolius*)

Known locations on site – spotty and occasional. May be transported by birds or follow linear development. Occur in hydric and mesic areas.

Treatment: Cut stump treatment with 50% Garlon 3A, 10% Garlon 4 or a basal bark application of 10% Garlon 4. Foliar application of Garlon 4, Garlon 3A, Roundup Pro, Roundup Super Concentrate, or Rodeo, according label directions may be used where appropriate. Glyphosate products are less effective when used alone in spring and early summer. Use Rodeo or cut stump application of 50% arsenal where plants are growing in aquatic sites.

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[1] Florida Exotic Pest Plant Council Web Site is: www.fleppc.org

Carrotwood (*Cupaniopsis anacardioides*),

Known locations on site – most likely in hammocks. . Birds eat the fruit and disperse the seeds. Introduced in the 1980s as an ornamental.

Treatment: Carrotwood is best treated basally with bark treatment of 10% Garlon 4 or cut stump treatment with 50% Garlon 3A.

Air Potato (*Dioscorea bulbifera*)

Documented and partially treated throughout the site. Disperses readily following land alterations and follows linear developments. Must be eradicated prior to transmission corridor development.

Treatment: A basal stem application of Garlon 4 is recommended although cut-stem treatments with 50% Garlon 3A or 10% garlon 4 is effective. If bulbils (potatoes) are present on vines, a basal bark treatment should be used because it will translocate into the bulbils. Collect bulbils from the ground and remove from site. Apply 10% Garlon 4 to stems emerging from tubers. Hand pulling followed by treatment of re-sprouts has also been effective.

Melaleuca or ***Punk Tree*** (*Melaleuca quinquenervia*)

Occurs in wetland near parking area. Seeds dispersed by wind following natural or mechanical disturbance. Site highly susceptible to dispersion after land clearing associated with on site or adjacent disturbances.

Treatment: For seedlings and saplings: (1) hand pull, being sure not to break plant off of root system and remove or place in piles to help reduce the chance that they will reroot or; (2) treat with foliar, low volume spot application of 5% Rodeo.

Old World Climbing Fern *(Lygodium microphyllum)*

Not documented on site, but could potentially become a problem. This species was first documented in southern Martin and northern Palm Beach counties in 1978. Windborne dispersal of spores aids quick expansion of range. Fire kills back this species, but does not eliminate it.

Treatment: When plants are actively growing, apply 2-3% solution of Rodeo as foliar spray, being sure to thoroughly cover foliage. Use 0.5% v/L nonionic surfactant that contains 90% active ingredient. After treatment of fern covered trees, eliminate fern where it attaches to the soil. Follow up treatments will be necessary.

Category II Species:

Creeping oxeye, wedelia (*Wedelia trilobata*). This species is found in relatively open, sunny areas along the edges of the wetlands. It is a ground creeping pioneer species. Wedelias also thrive along shorelines on beaches and dunes.

Reasonable control of creeping oxeye may be achieved using 2% Roundup Biactive (a.c 360 g/L glyphosate) on Ludwigia. Chemical control needs to be ongoing to control new germinations.

Primrose willow (*Ludwigia peruviana*) is pervasive in shrubby swamps, particularly where disturbances have occurred. It often co-dominates early transitional shrub swamps with the native Carolina willow (*Salix caroliniana*). Primrose willow is represented on site in patches within the more open swamp areas.

Reasonable control can be achieved using 2 % Roundup Biactive (a.c 360 g/L glyphosate) on Ludwigia. Chemical control needs to be ongoing to control new germinations.

Key References:

Aquatic Weed Management Guide. Publication SP55. University of Florida, Institute of Food and Agricultural Sciences, Gainesville.

Florida Exotic Pest Plant Council. 2003. List of Invasive Species. http://www.fleppc.org/plantlist/03list.htm

Florida Weed Management Guide. Annually updated reference for chemicals used in weed control in Florida. Publication SP53. University of Florida, Institute of Food and Agricultural Sciences, Gainesville.

Langeland, K.A., and R.K. Stocker. 1997. Control on non-native plants in natural areas of Florida. Publication SP242. University of Florida, Institute of Food and Agricultural Sciences, Gainesville.

These Publications can be ordered by contacting:

Publications Distribution Center – University of Florida
P.O. Box 110011
Gainesville, FL 32911
1-800-226-1764
www.ifas.ufl.edu

ADDENDUM F.
SITE VISIT FORM

PATROL REPORT

Site:	**Time** **Start** **End**
Date	
Patrolled by:	
Area Covered:	
Security Observations:	
Exotic Species Observations: GPS - Yes, No	
Wildlife Observations	
Plant Species Observations	
Other:	
Recommendations: (follow up, GPS needs, Exotic species removal, listed species management, etc.)	

APPENDIX G.
COMMITMENTS TO FLORIDA COMMUNITIES TRUST

This Plan has been written in a manner consistent with the guidelines set forth by the Florida Communities Trust. This Plan is structured to follow the outline developed by a working group consisting of the state's leading preserve land managers. The information contained herein was first collected and submitted to the FCT using the FCT land management plan format. It has been modified to include new information regarding monitoring wells (See Appendix H). All the commitments in the originally submitted plan remain; the statement commitments are restated below.

- The Grant Funding from FCT was used to acquire the Project Site and this Management Plan was developed to ensure that the Project Site will be developed in accordance with the Grant Award Agreement and in furtherance of the purpose of the grant application.

- The project Site will be managed only for the conservation, protection, and enhancement of natural resources, and for public outdoor recreation that is compatible with the conservation, protection, and enhancement of the site.

- The Project Site is identified in all literature and advertising as acquired with funds from the "Florida Communities Trust" and operated as a natural conservation area, outdoor recreation area or other appropriate descriptive language.

- At least one sign identifying the Project Site as being purchased with funds from "Florida Community Trust" shall be placed near the main public entrance. The sign shall be at least 3' x 4' in size and include the FCT logo and the year the site was acquired.

- The County acknowledges that any proposed modification of the Management Plan and/or undertaking any site alterations or physical improvements that are not addressed in this plan require prior FCT review and approval.

- The County will provide FCT 60 day prior written notice and information regarding any lease of any interest, the operation of any concession, any sale or option, the granting of any management contracts, and any use by any person other than in such person's capacity as a member of the general public and no document will be executed without the prior written approval of FCT.

- The County acknowledges that it is their responsibility for preparing an Annual Stewardship Report, due on January 30 of each year, which evaluates the implementation of the Management Plan.

- The County acknowledges that any proposed modification of the Management Plan and/or undertaking any site alterations or physical improvements that are not addressed in the Recipients' approved Management Plan requires prior FCT review and approval.

APPENDIX H
WELLFIELD MONITORING

Monitoring Wells

The Intermediate Aquifer System is an important aspect of ground water resource management in Sarasota County. Sustainability of this resource is of utmost importance to area residents who depend on water from the upper two permeable zones for domestic supply, landscape irrigation, and agricultural supply. Expansion of the Intermediate Aquifer monitoring network will help insure protection of this valuable water resource.

In June 2004, Sarasota County authorized the installation of 3 Intermediate Aquifer monitoring wells which will be part of a County-wide monitoring program (See Appendix H). The project was co-funded by the Southwest Florida Water Management District who provided technical oversight during well installation. Wells were installed at depths of 5 feet (Surficial Aquifer), 110 feet (Intermediate Aquifer – Permeable Zone 2) and 300 feet (Intermediate Aquifer – Permeable Zone 3) (See Appendix H for technical drawings). The wells are located just north of the Beneva Road entrance and parking lot (See Appendix H for current photo of site).

Monitoring of ground water levels and ground water quality in the Intermediate Aquifer System at Red Bug Slough supports the objectives of the Board of County Commissioners' Strategic Initiative, "Water Resources Management," by ensuring the quality and quantity of the County's ground water resource and the integrity of associated natural systems. These data will allow Sarasota County to optimize water use and supply sustainability and to remain proactive and preventative in the maintenance of the County's ground water resources.

Red Bug Slough Preserve
Groundwater Monitoring Wells
Photo by Jeff Weber, June 6, 2005

As-Built Diagram - Red Bug Slough Site
Monitor Well PZ2
Sarasota County, Florida

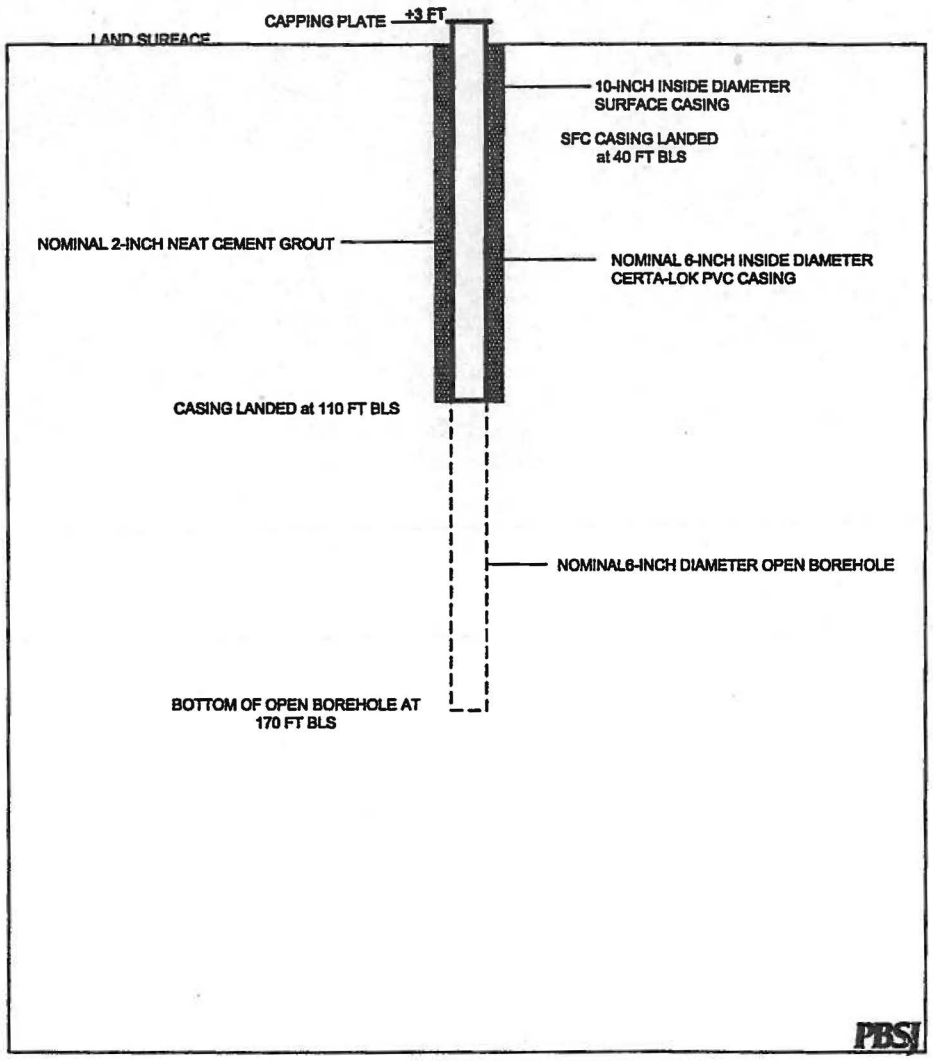

Figure 3

As-Built Diagram - Red Bug Slough Site
Monitor Well PZ3
Sarasota County, Florida

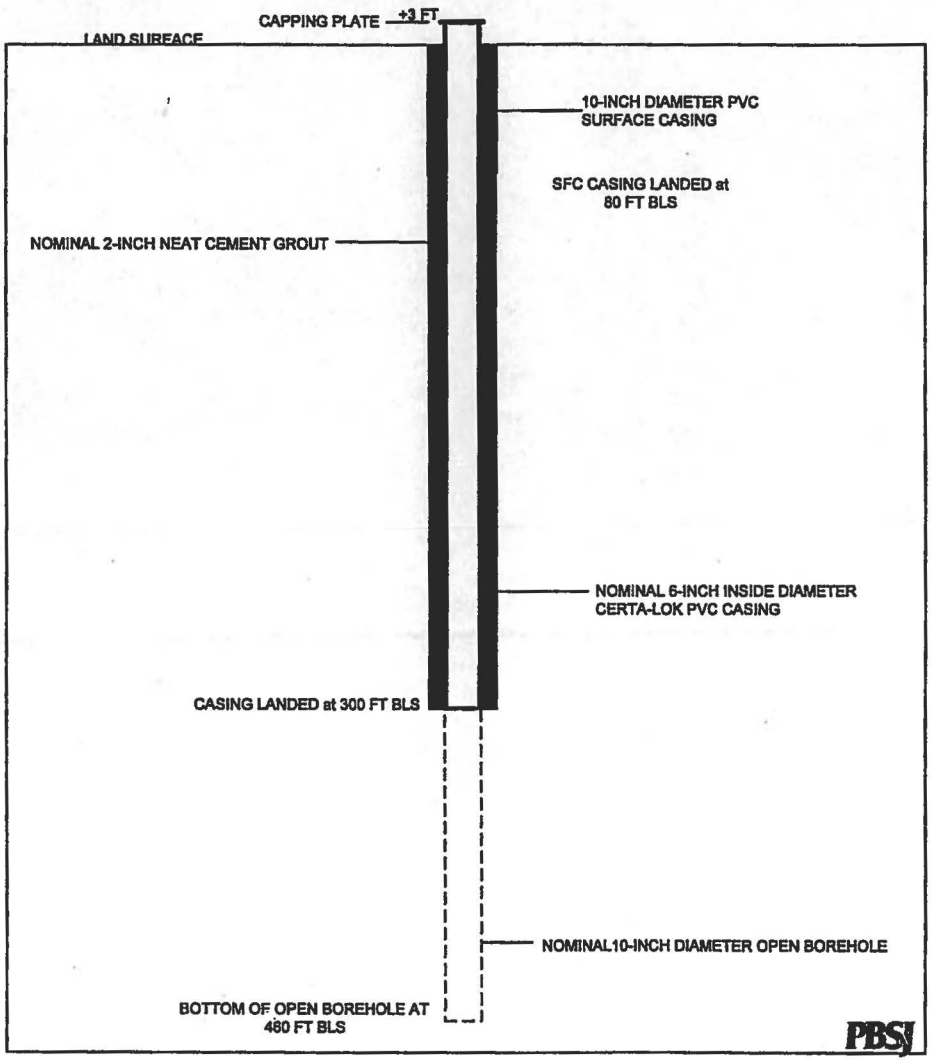

Figure 2

As-Built Diagram - Red Bug Slough Site
Monitor Well SAS
Sarasota County, Florida

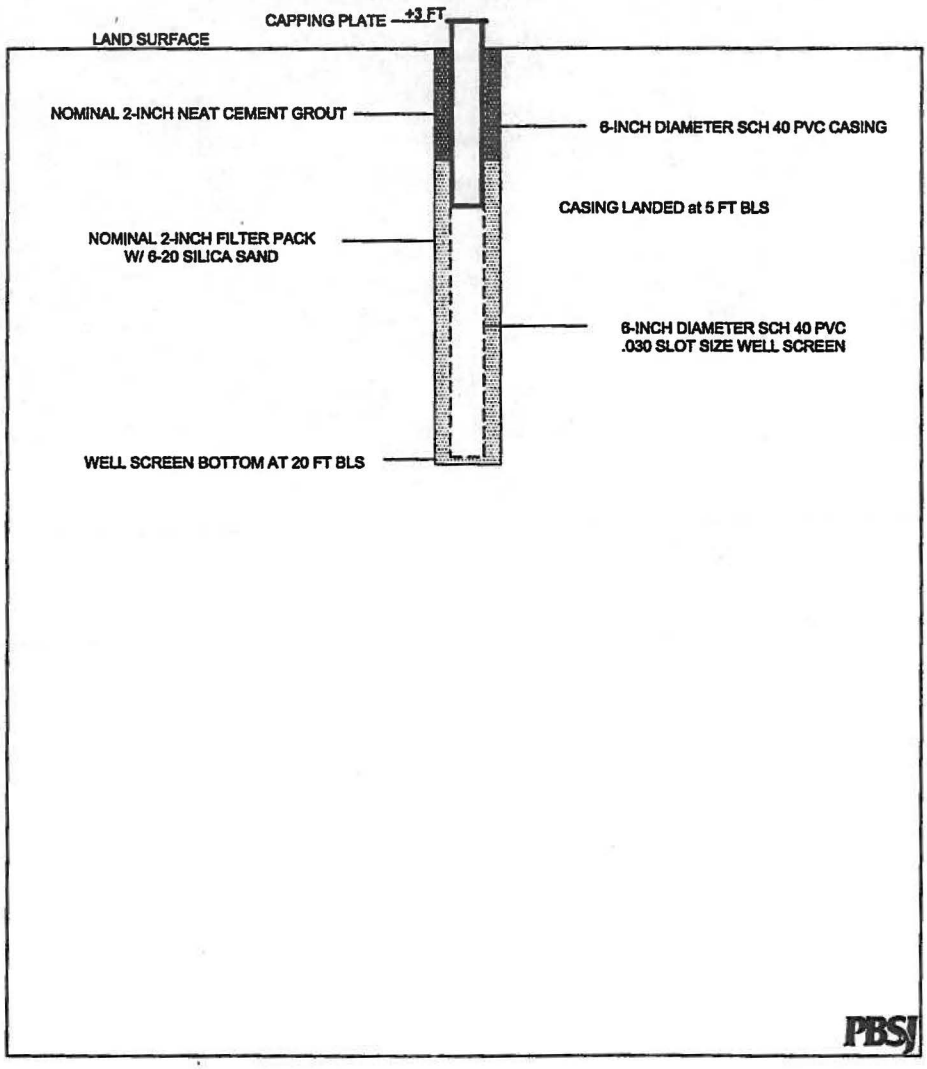

Figure 4