Lee County Board Of County Commissioners
Agenda Item Summary

Blue Sheet No. 20051172

1. ACTION REQUESTED/PURPOSE:

Approve the Pine Lake Preserve (PLP) Land Stewardship Plan.

2. WHAT ACTION ACCOMPLISHES:

Approving of the PLP Plan establishes guidelines for restoration and public use facilities at PLP.

3. MANAGEMENT RECOMMENDATION: Approve the plan so Land Stewardship staff can begin implementation.

4. Departmental Category: 11 C11B		**5. Meeting Date:** 09-06-2005
6. Agenda:	**7. Requirement/Purpose:** *(specify)*	**8. Request Initiated:**
X **Consent**	___ **Statute**	**Commissioner**
___ **Administrative**	___ **Ordinance**	**Department** Parks & Recreation
___ **Appeals**	___ **Admin. Code**	**Division**
___ **Public**	X **Other**	**By:** John Yarbrough, Director
___ **Walk-On**		John Yarbrough

9. Background:

A Land Stewardship Plan is necessary for appropriate and planned restoration, management and public use facility development of any Conservation 20/20 Preserve. The CLASAC (Conservation Lands Acquisition and Stewardship Advisory Committee) unanimously passed a motion on August 11, 2005 accepting the Pine Lake Preserve Land Stewardship Plan.

The plan was available for public review on the internet, as well as at the Bonita Springs Public Library and the Bonita Springs YMCA. A public meeting was held July 20, 2005.

10. Review for Scheduling:

Department Director	Purchasing or Contracts	Human Resources	Other	County Attorney	Budget Services				County Manager/P.W. Director
					Analyst	Risk	Grants	Mgr.	
8-18-05				8/22/05	8/22/05	8/10/05	8/10/05		

11. Commission Action:

___ **Approved**
___ **Deferred**
___ **Denied**
___ **Other**

RECEIVED BY COUNTY ADMIN
8-22-05
11:35
COUNTY ADMIN FORWARDED TO:

RECVD. by CO. ATTY.
CO. ATTY. FORWARDED TO:
8-22-05

Pine Lake Preserve
Land Stewardship Plan

Prepared by the Land Stewardship Section
Lee County Department of Parks and Recreation

Approved by the Lee County Board of County Commissioners: (date)

Table of Contents

List of Exhibits

Vision Statement

It is the vision of the Lee County Parks and Recreation Department and the Conservation 20/20 Program to conserve, protect and restore Pine Lake Preserve to a productive, functional and viable ecosystem. The Preserve is an important piece of a larger floodplain that protects groundwater and recharges the aquifer in the Imperial River Watershed. Even further, it connects with the Flint Pen Strand and the Corkscrew Regional Ecosystem Watershed. The Preserve will also enhance water quality reaching Estero Bay via the Imperial River and provide valuable scenic, ecological and educational opportunities for visitors. The primary management objective for Pine Lake Preserve will be to improve the hydrologic components by increasing the water flowing onto the Preserve, slowing drainage within the boundaries of the Preserve and improving the borrow pit lake and Kehl Canal to provide increased habitat for wildlife

I. EXECUTIVE SUMMARY

Pine Lake Preserve (PLP) is located in southern Lee County within the limits of the City of Bonita Springs. The 131-acre Preserve was acquired in 2000 through the Conservation 20/20 (C20/20) Program for almost 2 million dollars. The Conservation 20/20 Program was established in 1996 after Lee County voters approved a referendum that increased property taxes by up to .5 mil for the purpose of purchasing and protecting environmentally sensitive lands. The Preserve borders land that is part of the Corkscrew Regional Ecosystem Watershed, the goal of which is to acquire and protect wetlands in the Imperial River Basin and the Flint Pen Strand that connect to Corkscrew Swamp Sanctuary. Pine Lake Preserve plays an important role in protecting these native ecosystems and increasing ground water in the Imperial River Watershed. Another function of the Preserve is to reduce flooding to neighbors and recharge the aquifer along with providing habitat for native plants and animals.

PLP is located within the portion of Florida that was created during the Pleistocene Epoch between 1.8 million to 10,000 years ago. In much of Lee County, including the area that PLP is located within, the Caloosahatchee and Fort Thompson geologic units are somewhat indistinct and have been lumped together as undifferentiated Tertiary/Quaternary shell-bearing units. This unit consists of a quartz sand blanket covering limestone and clay. All of Lee County is located within the Coastal Lowlands of Florida that extend around the coastal periphery of the state where elevations are generally below 100 feet (Myers 1990). Natural elevations on the Preserve are fairly level ranging from 12 to 16 feet above sea level.

Seven different soil types are found at PLP. All of these soil types are nearly level and poorly drained with moderate to rapid permeability at the surface. Each soil type has severe limitations on urban development due to the high water table. The Preserve mainly consists of a large borrow pit lake and surrounding woods that are a mix of cypress/pine communities, pine flatwoods and oak hammocks. The lake, especially during the dry season, provides habitat for a number of wading birds including herons, egrets, sandpipers, killdeer and black-necked stilts. American alligators have also been seen on multiple visits. Management practices at the Preserve including but not limited to exotic plant control, prescribed burning, trash removal, wildlife monitoring, restricting trails in certain areas, as well as enforcing regulations prohibiting activities such as dumping, weapons use and operation of motorized vehicles will all help with the protection of native plant and animal species.

Historically, Pine Lake Preserve contained various wetland ecosystems that were part of the floodplain of the Imperial River. The natural hydrologic components of Pine Lake Preserve has been severely altered due to road building, agricultural ditching and the construction of a borrow pit. Although the hydrologic

components on the site have been altered, the borrow pit provides habitat for wading birds and alligators.

Historical aerials indicate that Pine Lake Preserve was nearly unchanged through 1958. There was just one small dirt road that crossed over the southern portion of the Preserve. Development in the area began in 1960 when the Kehl Canal was constructed. Very few changes occurred at PLP until the early 1980's when the borrow pit was excavated. Shortly after this excavation, the dirt roads surrounding the Preserve in 1981 (E. Terry Street), 1983 (Bonita Grande Road) and 2004 (Kent Road) were paved. Future external influences to the Preserve will relate to the increased development in the area. Currently, there are two known development proposals in the planning stages. Owners of the property directly south of PLP have applied for a zoning change to accommodate a commercial development. The latest projected alternative for County Road 951 shows it being constructed either adjacent to the east boundary of PLP.

Recreational and public use activities at the Preserve will focus on hiking, bird watching and nature study. Benches placed strategically around the borrow pit will provide places for visitors to sit and view wildlife. Existing vegetation and/or plantings will provide shade and act as blinds. Although there is currently limited interest in the Preserve, the new YMCA at the corner of Kent Road and E. Terry Street may add an increased demand for recreation at the Preserve. The Bonita Bay Group, on behalf of the YMCA, has shown interest in being involved with any public use plans for educational and recreational use.

The goal of this land stewardship plan is to identify Preserve resources, develop strategies to protect those resources and implement restoration activities to restore PLP to a viable, functioning, natural system while insuring the Preserve will be managed in accordance with Lee County Parks and Recreation's Land Stewardship Operations Manual. Restoration and management activities at PLP will focus on fencing and signage, control of invasive exotic plant species, restoring hydrologic components, providing public access and recreation and enhancing wildlife habitat. A Management Action Plan that outlines restoration and stewardship goals has been developed. This plan outlines these goals and strategies, explains how to accomplish these goals, and provides a timetable for completion.

II. INTRODUCTION

Pine Lake Preserve (PLP) is located in southern Lee County within the limits of the City of Bonita Springs. The 131-acre Preserve was acquired in 2000 through the Conservation 20/20 Program for $195,000.

Historical aerial photographs from the 1940's and 50's indicate that the Preserve was once part of a vast wetland that drained into the Imperial River. PLP contains five different native plant communities, the largest being floodplain

swamp. The 1960's brought the first development to the region. The canals and roads cut off the historic surface water flow and slash pines invaded the swamp. Invasive exotic plants are located in all natural plant communities at the Preserve, but are typically found in small, scattered patches. Two melaleuca (*Melaleuca quinquenervia*) monocultures cover about 15% of PLP (19 acres). An additional 13% (17 acres) of the Preserve consists of disturbed areas (borrow pit and surrounding cleared area).

Land stewardship challenges for this Preserve are varied. Hydrologic changes on the Preserve started in the 1960's with the creation of the surrounding roads and canals. Ditches inside the Preserve, in addition to the borrow pit have compounded the disturbances. Several listed species utilize PLP to varying degrees, including American alligators (*Alligator mississippiensis*), wood storks (*Mycteria americana*) and gopher tortoises (*Gopherus polyphemus*). Utilization by wildlife species, including those that are listed, should increase as restoration of these communities occurs.

The purpose of this stewardship plan is to define the conservation goals for PLP which will address the above concerns. The plan is a guide for Lee County's Department of Parks and Recreation to implement best management practices for the proper stewardship and protection of the Preserve. It also can be used as a reference guide due to the tremendous amount of research that was conducted through field work, reviewing scientific literature, studies and historical records to understand how the Preserve functions in the ecosystem, what wildlife and plants are found within its boundaries as well as human history and influences.

The overall restoration goal for PLP will be to improve hydrologic flow and wildlife habitat. The primary management objective for Pine Lake Preserve will be to restore a more natural hydrologic regime by increasing the water flowing into the Preserve, slowing drainage within the boundaries of the Preserve and improving the borrow pit lake and Kehl Canal to provide increased habitat for wildlife. Invasive exotic plants will be controlled and regular monitoring will ensure exotic plants are kept at a maintenance level. A marked trail system and benches will be provided for the public. Staff and volunteers will continue to monitor wildlife utilization of the property.

III. LOCATION AND SITE DESCRIPTION

Pine Lake Preserve is located in southern Lee County, on the northeast corner of Section 31, Township 47 South, Range 26 East. The physical address is 12750 E. Terry Street, Bonita Springs, Florida 34135. E. Terry Street borders the Preserve on the north, Bonita Grande Drive on the east, the Kehl Canal on the south and Kent Road to the west. See Figures 1 and 2.

The Preserve consists of a mosaic of several native plant communities, including pine flatwoods, hammocks and floodplain swamps. These community designations are based on the Florida Natural Areas Inventory's Guide to the Natural Communities of Florida (FNAI, 1990).

Figure 1: Location Map

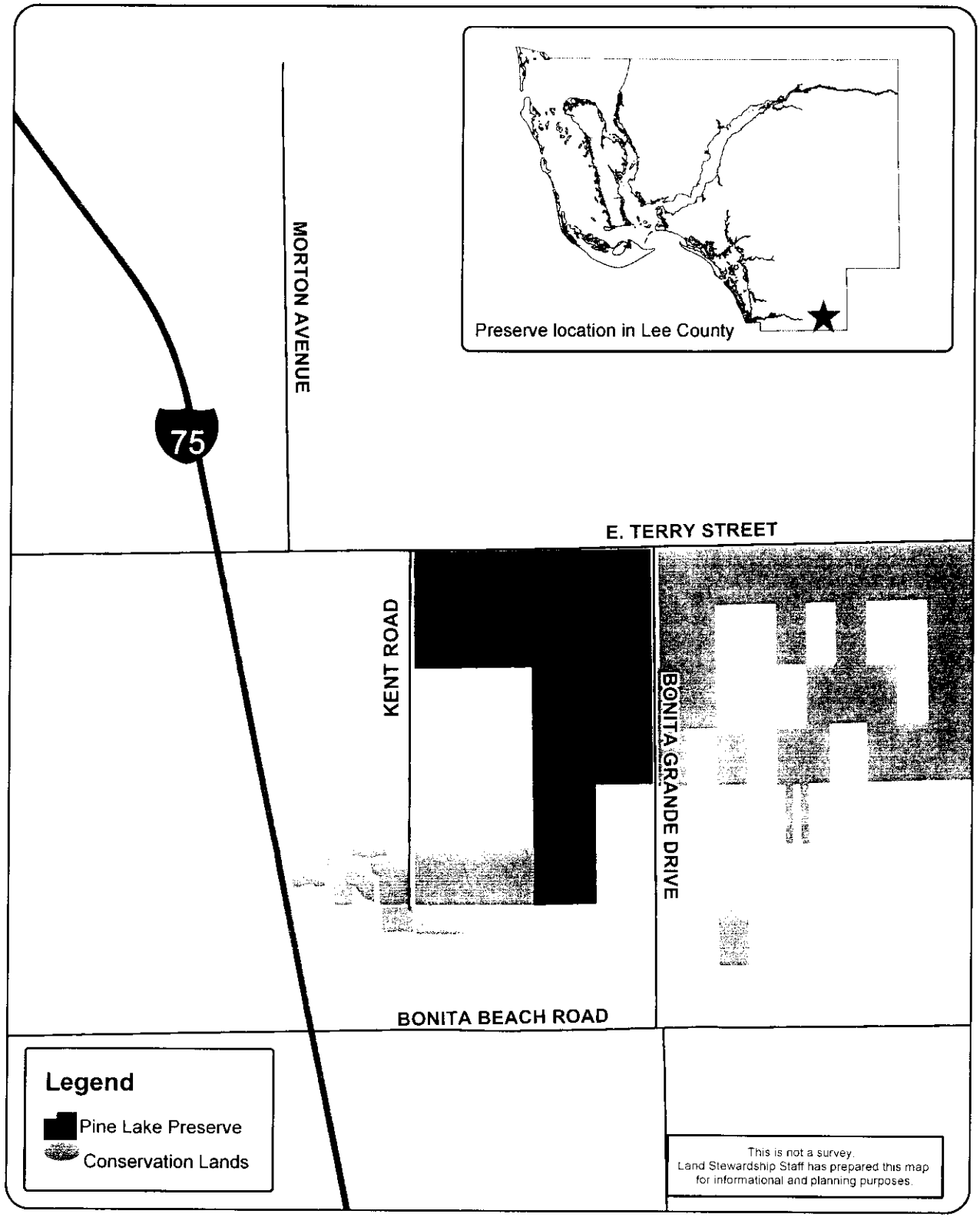
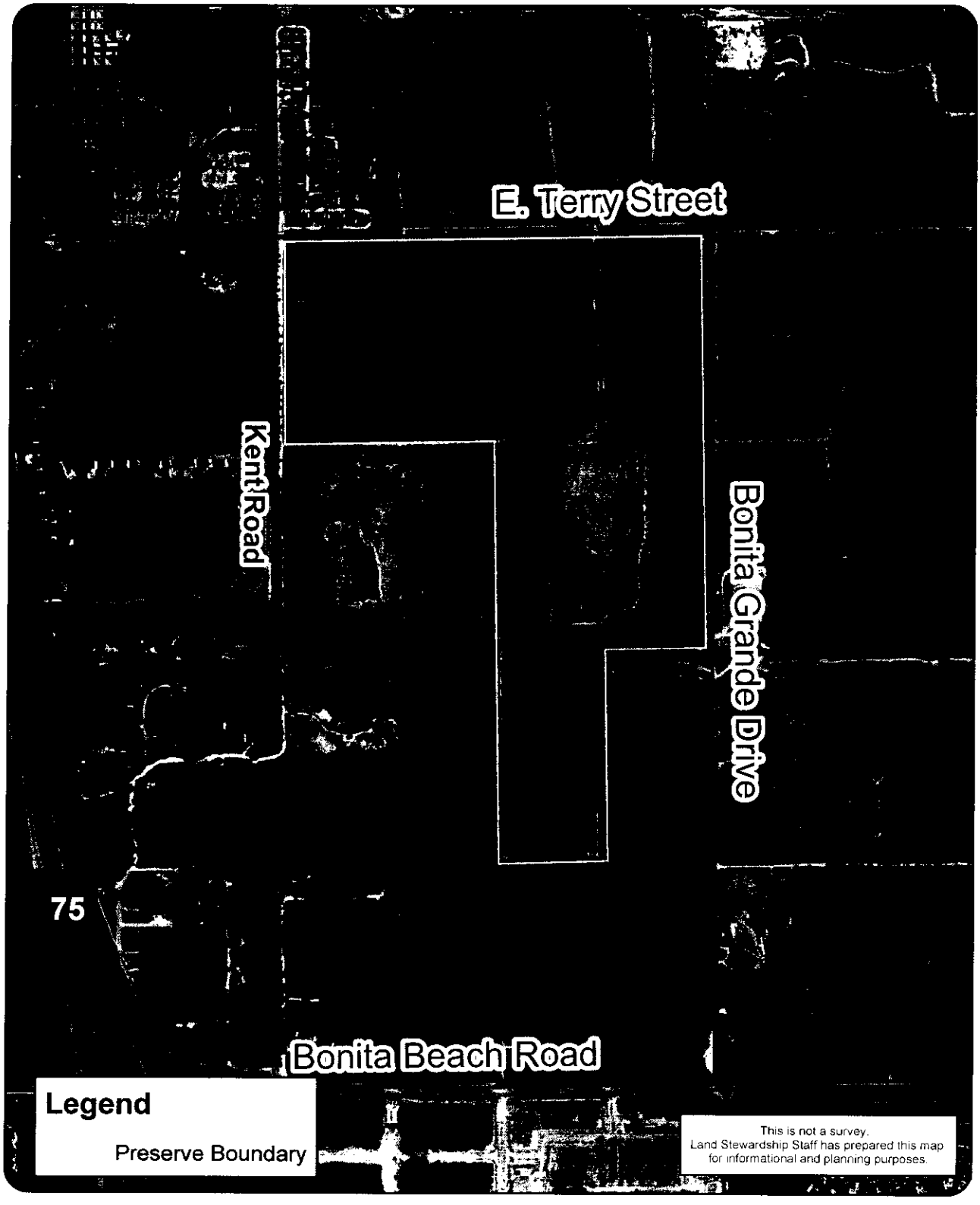


Figure 2: 2002 Aerial Photograph



IV. NATURAL RESOURCES DESCRIPTION

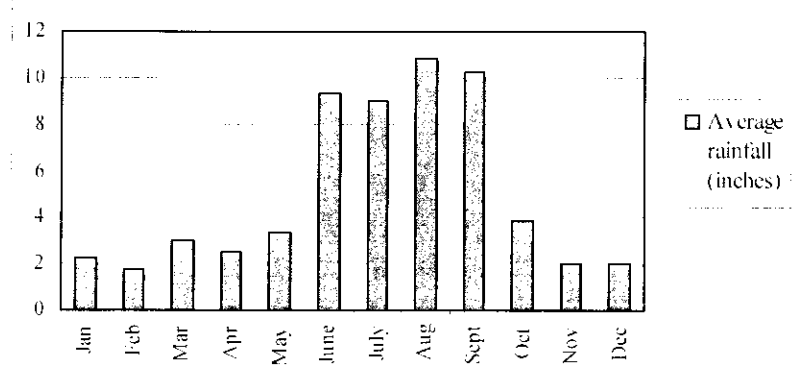
A. Physical Resources

i. Climate

Southwest Florida has a humid, sub-tropical climate due to its maritime influence from the Caribbean Sea and the Gulf of Mexico. The mild temperatures encourage winter residents and tourists to visit the area. Temperate climate influences are exerted as well, with infrequent but significant freezes occurring. These freezes prevent some of the more tropical plants from becoming established and occasionally damage the subtropical vegetation. Cold fronts regularly push cool, sometimes moist weather from the southeastern U.S. to southwest Florida during the winter. These cold fronts bring birds to the Preserve and utilize the area as either a winter roosting and feeding area or a stop off point on a longer migration.

The graph below depicts the rainfall data collected by Lee County Division of Natural Resources on a daily basis from the Bonita Springs Utility facility. The gauge is located at 11860 E. Terry Street in Bonita Springs, approximately 0.6 miles west of the corner of E. Terry Street and Kent Road. Average annual rainfall over the last ten years was 60.15 inches.

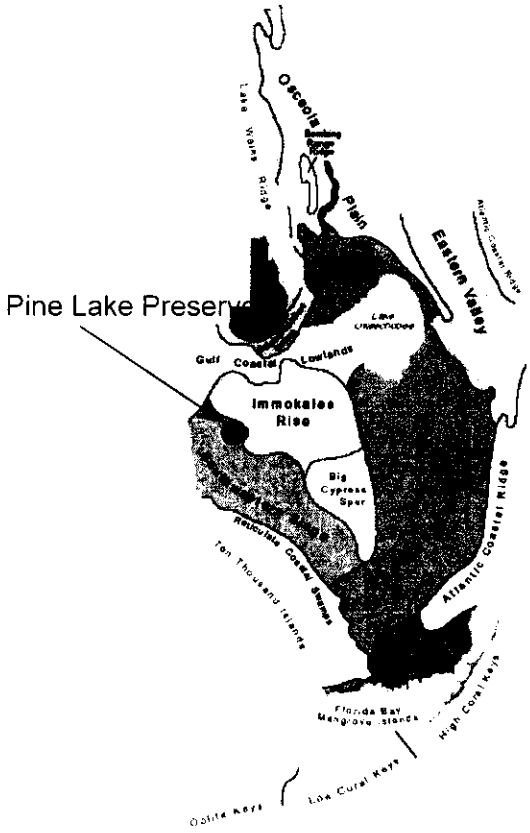
Bonita Springs Average Rainfall 1991-2004



ii. Geology

Pine Lake Preserve is located on the border of the Southwestern Slope and the Immokalee Rise physiographic regions. The Gulf Coastal Lowlands are to the north, Pine Island Sound and Estero Bay to the west, the Reticulate Coastal Swamps to the southwest and the Everglades and the Big Cypress Spur to the east and southeast.

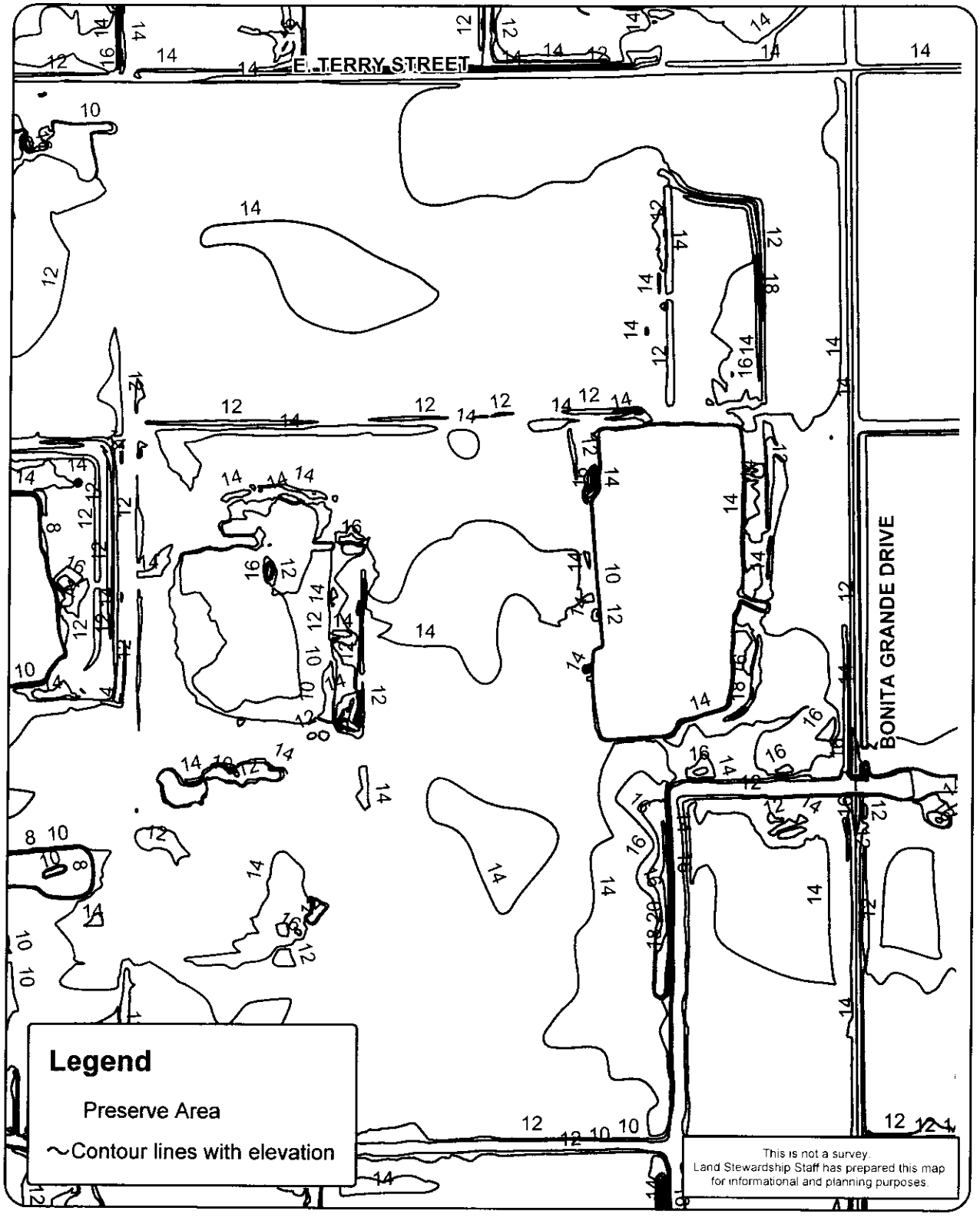
Physiographic Regions



The Southwestern Slope originated as a marine terrace during periods of higher sea level and varies in elevation from sea level to 25 feet (SWFRPC, 1997). The Immokalee Rise, like the Atlantic Coastal Ridge south of West Palm Beach, is a southerly extension of Pamlico marine sand invading the Distal Zone (the southern part) of the Florida Peninsula from the sand dominated Central Zone to the north. However, unlike the Atlantic Coastal Ridge, the Immokalee Rise shows little evidence of a Pamlico shoreline. It seems to have been built as a sub-marine shoal extending south from a mainland cape at the south end of the Desoto Plain much in the same way that the present offshore shoal extends southward from Cape Romano (White, 1970). The above figure is from the SFWMD Water Management Plan 2000 (Fernald and Purdam, 1998).

The portion of Florida that Pine Lake Preserve is located within was created during the Pleistocene Epoch between 1.8 million to 10,000 years ago. This period is also known as the Ice Age, where huge ice sheets formed across Canada and the northern United States. When these ice sheets were formed, they consumed large quantities of seawater, dropping the current sea level 300 or more feet, which greatly increased the land area of what is now Florida. As the glaciers shrank, sea levels rose, and the Florida peninsula was again flooded. During the peak warm periods, sea level reached 150 feet above the

Figure 3: Topography Map



iv. Soils

The Soil Survey of Lee County, Florida (Henderson, 1984) was designed for a diverse group of clients to be able to comprehend soil behavior, physical and chemical properties, land use limitations, potential impacts, and protection of the environment. Based on this classification, six different soil types are found at Pine Lake Preserve. Figure 4 shows the location of these soils and Table 1 summarizes the characteristics of the soils found at Pine Lake Preserve. These characteristics have been organized in the table to quickly provide conservation managers with pertinent soils information for understanding restrictions and/or results regarding future habitat restoration and probable recreational plan limitations and expenses. The descriptions below explain the soil characteristics found in Table 1.

Habitats (Range Sites):
Based on the Soil Survey of Lee County, there are eight generalized range site categories in the county and three are found on PLP. Note that these categories are not Florida Natural Areas Inventory (FNAI) designations and may not correspond with the vegetation that is currently present on site. The ranges identified on the Preserve are:

- South Florida Flatwoods - Nearly level areas with scattered to numerous pine trees (*Pinus spp.*), saw palmetto (*Seronea repens*), gallberry (*Ilex glabra*), and other woody plants.
- Slough - Open grassland where nearly level areas act as broad natural drainage courses in the flatwoods. Potential plant community is dominated by maidencane (*Panicum hemitomon*) and bluestem (*Andropogon* spp.).
- Freshwater marshes and ponds - Open grassland marshes or ponds (depressions) with the potential to produce significant amounts of various grasses, sedges, and rushes. Water fluctuates throughout the year. The areas at PLP whose soil types are designated as marshes or ponds have a mixed cover type of cypress and pine. There is evidence of standing water during the wet season.

Wetland Classification:
- F-Flooding: Soil flooded by moving water from stream overflow, runoff or high tides.
- S-Slough (sheet flow): A broad nearly level, poorly defined drainage way that is subject to sheet-flow during the rainy season.
- P-Ponding: Standing water on soils in closed depressions. The water can be removed only by percolation or evapotranspiration.

Hydrologic group:
Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped

according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms. The four hydrologic soil groups are:

- A - Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. High rate of water transmission.
- B - Soils having a moderate infiltration rate (low to moderate runoff potential) when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well-drained soils that have moderately fine texture to moderately coarse texture. Moderate rate of water transmission.
- C - Soils having a slow infiltration rate (moderate to high runoff potential) when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. Slow rate of water transmission.
- D - Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist mainly of clays that have a high shrink-well potential, soils that have a permanent high water table, soils that a have a clay pan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. Very slow rate of water transmission.

Note that some of the soil types are shown as having dual hydrologic groups, such as B/D. A B/D listing means that under natural conditions the soil belongs to D, but by artificial methods the water table can be lowered sufficiently so that the soil fits in B. Berms, ditches and a borrow pit have caused alterations to the of the Preserve.

All soil types at Pine Lake Preserve are nearly level and poorly drained with moderate to rapid permeability at the surface. Each soil type has severe limitations on urban development due to the high water table. The Felda Fine sand and Malabar Fine sand, both depressional, have severe limitations for recreational use also due to the high water table and standing water in the wet season. Limited trails and recreational activities will be allowed in these areas. Pompano Fine sand, depressional has severe limitations for sanitary facilities.

The Malabar Fine and Felda Fine sands, both depressional soil types are associated with concave areas with slopes of less than 1%. Native vegetation in these areas would consist of cypress (*Taxodium* spp.), wax myrtle (*Myrica cerifera*) and water tolerant grasses. Soil may be ponded in these areas for up to 6 months a year. Pompano fine sand, depressional is found in low-lying areas associated with depressions. The water table is within 10 inches of the surface for almost 4 months a year. Native vegetation here includes St. John's wort (*Hypericum* spp.) and wax myrtle.

Pineda Fine sand is closely associated with sloughs in areas that are nearly level to concave with less than 1% slope. Native vegetation on this soil type is pineland threeawn (*Aristida* spp.), panicums (*Panicum* spp.), saw palmetto,

maidencane, wax myrtle and south Florida slash pine (*Pinus elliotii* var. *densa*). Immokalee and Oldsmar sands are usually associated with pine flatwoods with a slope up to 2%. These areas historically would have saw palmetto, pineland threeawn, and slash pine. They are slightly drier than the ones associated with sloughs. The water table is within 10 inches of the surface for 1 to 4 months a year and greater than 40 inches below the surface in dry periods.

Figure 4: Soils Map

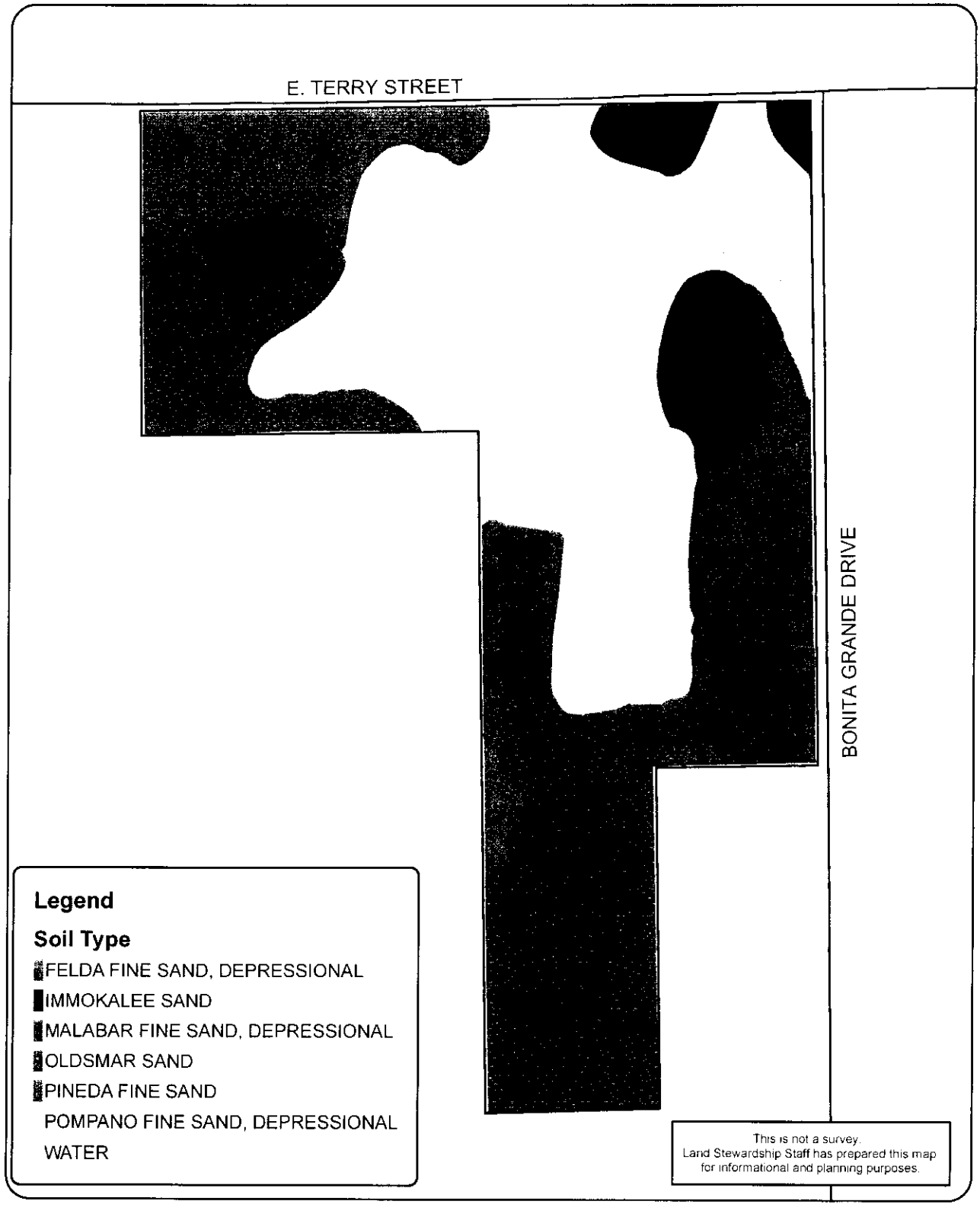


Table 1: Summary of Soil Characteristics

				Physical Attributes							*Biological Attributes*			
Soil Types	Total Acres	% of Preserve	Habitats (range site)	Wetland Class (1)	Hydrologic Group (2)	Surface Permeability	Subsurface Permeability	Water Table Within 10" of surface	Water table within 10 – 40" of surface	% Organic matter	Potential as habitat for wildlife in...			Limitations for recreational paths and trails
											Openland	Woodland	Wetland	
Immokalee Sand	7.97	6.05	flatwoods		B/D	rapid	rapid	1 – 3 months	2 – 6 months	1 – 2%	poor	poor	poor	severe: wetness, too sandy
Oldsmar Sand	8.07	6.13	broad flatwoods		B/D	rapid	rapid	1 – 3 months	> 6 months	1 – 2%	fair	fair	poor	severe: wetness, too sandy

*Water table is above the surface of soil

Color Key:

Wet

(1) Wetland Classification:
P – Ponding: Standing water on soils in closed depressions
S – Slough (sheet flow): A broad nearly level, poorly defined drainage way that is subject to sheet-flow during the rainy season.

(2) Hydrologic Group:
B –moderate rate of water transmission.
D –very slow rate of water transmission.

v. Hydrologic Components and Watershed

Pine Lake Preserve is located in the Imperial River Watershed (IRW) (Figure 5). The IRW is approximately 86 square miles, the largest in Lee County. It contains two sub-basins, Leitner Creek to the north of the Preserve and Oak Creek to the south of the Preserve. The land uses in the area of IRW to the west of I-75 inlcude single-family homes and other urban areas. At its western-most point, the Imperial River flows into the Estero Bay and is an important fresh water source for the bay. Portions of IRW that are east of I-75 and north of Bonita Beach Road are mostly agricultural land use and wetlands, which play an important role in storm water run-off and ground water recharge. The Preserve borders land that is part of the Corkscrew Regional Ecosystem Watershed (CREW) Trust. The goal of of the Trust is to acquire and protect wetlands in the Imperial River Basin and Flint Pen Strand that connect to Corkscrew Swamp Sanctuary. Pine Lake Preserve plays an important role in protecting these native ecosystems, connecting other existing conservation land and increasing ground water recharge in the IRW.

Hydrologic changes at Pine Lake Preserve include road building, agricultural ditching and the building of a borrow pit. In the early 1960's, Kehl Canal, which is the southern border of the Preserve, was created to drain land to the east of the Preserve for the failed Suncoast Acres residential community. This canal blocks the original channel of the Imperial River that once flowed through the southern arm of the property. In the mid 1990's a weir was installed east of Bonita Grande Drive on the Kehl Canal for water control to raise the water table, increase wetlands hydroperiod and reduce the draining of wetlands to the east.

Multiple ditches have been dug across the property. One ditch runs from the northern border of the property to the borrow pit along the access road. Another series of ditches runs east from the first ditch near the northern boundary and turns to the south and follows the borrow pit all the way to the southern border. A short ditch has been excavated from the southeastern corner of the borrow pit to Kehl Canal. A final ditch runs east/west along the southern border of the western arm of the preserve. See Figure 6 for locations of the ditches and canals. Construction of E. Terry Street in 1981 severely altered the flow of water on the property. Water flow from north to south across the road has been greatly slowed. It is possible insufficient culverts were placed under the road to allow adequate water flow during the wet season. Insufficient water flow is evident in the presence of upland species in areas that were once considered wetlands and have hydric soils.

In October 2004, a cut in the berm of the Kehl Canal was made where the original Imperial riverbed once flowed and another cut was made on the western boundary through an elevated roadbed. These berm cuts were made to restore flow through the original channel of the Imperial River. Water did flow through the historic riverbed during the summer of 2004 but only during heavy rain events

when water level in the Kehl Canal rose dramatically. There is a 4-5 foot difference between the bottom of the Kehl Canal and the bottom of the old River channel. Land Stewardship staff is researching methods to slow water in the Kehl Canal and increase flow to the river channel. In the fall of 2004, Lee County DOT upgraded Kent Road, on the western border of the Preserve, by straightening and paving it. New ditches were installed along the road on the west side of the property.

The borrow pit was constructed in 1980-81. Material from the borrow pit was used in the construction of Interstate-75 or sold for off-site uses. The borrow pit now has become the feeding grounds for many wading birds in the dry season, and provides habitat for turtles and alligators. A borrow pit on the property to the west of the Preserve was also constructed in the 80's, which may be negatively affecting the hydrologic regime of the Preserve.

Figure 5: Watershed Map

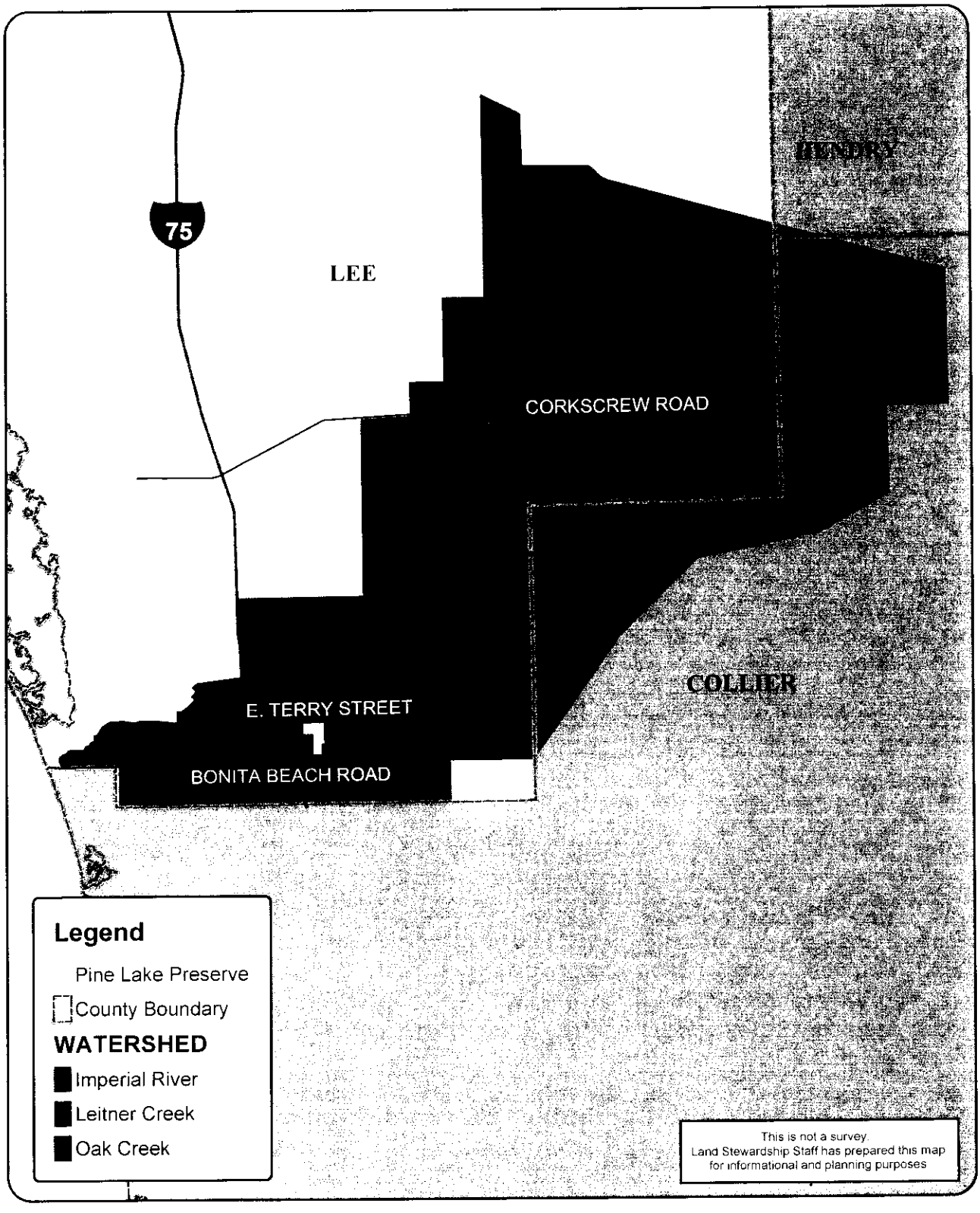
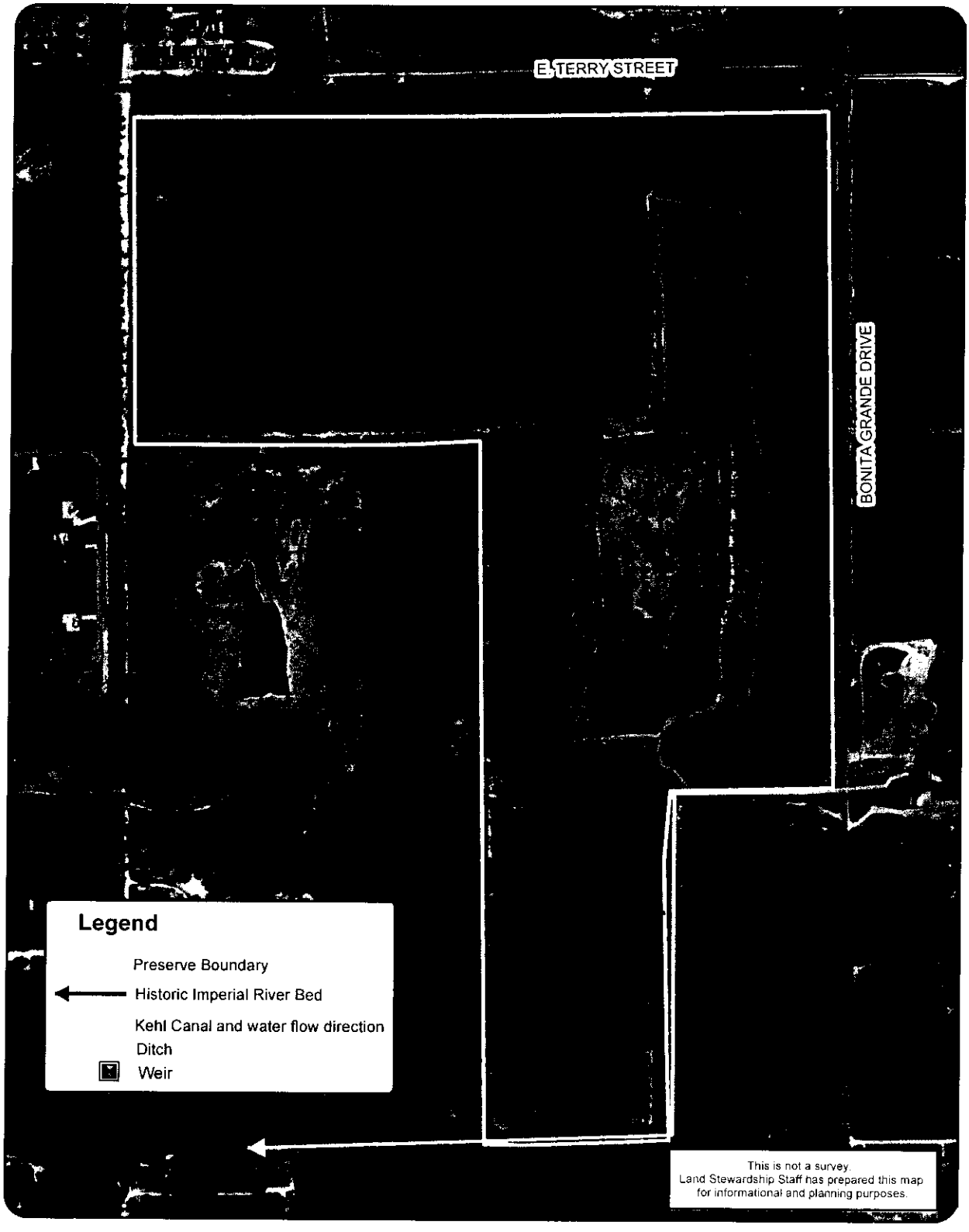


Figure 6: Canals and Ditches at PLP



B. Biological Resources

i. Ecosystem Function

The Preserve is an important part of a larger conservation effort to offset development in the area. Principle functions of the Preserve include flood reduction to neighbors and aquifer recharge as well as providing habitat for native plants and animals. Historically, Pine Lake Preserve contained various wetland ecosystems that were part of the floodplain of the Imperial River. Hydrologic changes on the Preserve include ditches and berms that cut off sheetflow and the flow of the river and the construction of an 11-acre borrow pit. Restoring the natural hydrologic regime to the Preserve will be an important part of this plan. Although the hydrologic changes have occurred on site, the borrow pit now provides winter habitat for wading birds and alligators.

ii. Natural Plant Communities

Pine Lake Preserve consists of seven different plant community types ranging from scrubby flatwoods to floodplain swamps. Figure 7 illustrates the location of each community at PLP. These communities are defined using the Florida Natural Area's Guide to the Natural Communities of Florida (1990). Appendix A contains a list of plant species identified thus far during numerous site inspections to PLP. This list will be updated during quarterly site inspections.

Scrubby Flatwoods Community – 6.46 acres, 4.9% coverage of PLP

The scrubby flatwoods at PLP are found in a small isolated area in the northwest corner of the Preserve. Synonyms for this community type include xeric flatwoods or dry flatwoods. Scrubby flatwoods are characterized by an open canopy of widely scattered pine trees with a sparse, shrubby understory and numerous areas of barren white sand. Plants typically found are south Florida slash pine, live oak (*Quercus virginiana*), wiregrass (*Aristida stricta*), saw palmetto and gopher apple (*Licana michauxii*). The white sandy soil found here is typically several feet deep and drains rapidly. These areas usually do not flood even under extremely wet conditions. Naturally occurring fire returns every 8 to 25 years. This longer return interval is due to the lack of ground vegetation and abundance of non-combustible scrub-oak leaf litter that is present. Brazilian pepper (*Schinus terebinthifolius*) is the main exotic plant species present at less than 25% infestation.

Floodplain Swamp Community – 50.19 acres, 38.5% coverage of PLP

The majority of the northern part of the Preserve is designated as a floodplain swamp community. These communities occur on flooded soils along stream channels and low spots in river floodplains. Dominant trees include bald cypress

(*Taxodium distichum*) and pond cypress (*Taxodium ascendens*) with sparse understory and ground cover. Other typical plants that occur are wax myrtle, dahoon holly (*Ilex cassine*), gallbery (*Ilex glabra*), marsh fern (*Thelypteris palustris*) and laurel greenbrier (*Smilax laurifolia*). These sites are typically flooded for most of the year. The duration of flooding determines the species composition in the understory. Exotics present are melaleuca, downy rose myrtle (*Rhodomyrtus tomentosa*) and Brazilian pepper with less than 25% total infestation. There are scattered pockets of melaleuca along the northern border of the property and it increases moving east towards the access road from E. Terry Street. The Brazilian pepper is dense along the improved farm road on the southern edge of the western arm. There are two different types of floodplain swamp communities present at PLP.

Floodplain Swamp – Slash pine dominated – 42.0 acres, 32.2% coverage of PLP

Due to the hydrologic changes at PLP, this site has an encroachment of slash pine. The canopy in the western arm has greater than 50% slash pine. The cypress is beginning to show signs of suppression by the pine and the pine are becoming the dominant species. This area seems to be slightly drier than the area to the east of the north access gate. It has a more diverse understory of saw palmetto, cabbage palm (*Sabal palmetto*), myrsine (*Myrsine quianensis*) and swamp fern.

Floodplain Swamp – Slash pine co-dominant – 8.19 acres, 6.3% coverage of PLP

In the area to the east of the access gate on E. Terry Street, slash pine occupies less than 50% of the canopy. There are many pure cypress stands with little to no understory vegetation. In other parts of this community there are occasional clumps of saw palmetto and scattered wax myrtle and ferns. It is evident that there is standing water for a portion of the year.

Hydric Hammock Community – 12.98 acres, 9.9% coverage of PLP

The hydric hammock community is found in the southern arm of the Preserve along the old Imperial River channel. Synonyms for this community inlcude wetland hardwood hammock and wet hammock. These sites are characterized as well developed hardwood and cabbage palm forests with a variable understory of palms and ferns. Understory plants are typically laurel oak (*Quercus laurifolia*), swamp bay (*Persea palustris*), wax myrtle, saw palmetto, dahoon holly and myrsine.

Hydric hammocks occur on low, flat, wet sites where limestone may be near the surface. Soils are very sandy with considerable organic material that are only inundated for short periods after heavy rains. Because of their saturated soil and herbaceous ground cover, these hammocks rarely burn. Hydric hammocks are very sensitive to hydrologic changes. If the water table is lowered too much, the site will gradually change to a mesic site. If flooded, many of the trees will die and flood tolerant species will replace them. There is melaleuca and Brazilian pepper along the ditch on the eastern side of the arm and some melaleuca along the old river channel. Overall, exotic infestation is less than 25% in this community.

Mesic Flatwoods Community – 20.03 acres, 15.3% coverage of PLP

The mesic flatwoods communities are found surrounding the borrow pit area. Synonyms for this plant community include pine flatwoods and pine savannahs. Mesic flatwoods occur on relatively flat, moderately to poorly drained soils. Standing water is common for brief periods during the rainy season. Mesic flatwoods are characterized as having an open canopy with widely spaced pine trees and a dense ground cover of herbs and shrubs. Typical plants growing in these communities at PLP include slash pine, saw palmetto, gallberry, wax myrtle, shiny blueberry (*Vaccinium myrsinites*), and yellow-eyed grass (*Xyris spp.*).

Historically, natural fire probably burned in these communities every 1-8 years. Without fairly frequent fires, mesic flatwoods will succeed into hardwood-dominated forests whose closed canopy would gradually eliminate the groundcover herbs and shrubs. On the other hand, too frequent or too hot fires would eliminate pine recruitment and eventually transform the mesic flatwoods into dry prairie.

Exotics include downy rose myrtle, melaleuca and Brazilian pepper. The majority of the Brazilian pepper is located on the south end of Preserve along the Kehl Canal and in the area to the west of the borrow pit. Exotic infestation is less than 25%.

Prairie Hammock Community – 4.64 acres, 3.5% coverage of PLP

There is only a small area of this community on the extreme southwestern tip of the Preserve. Synonyms for this community include palm/oak hammock and hydric hammock. The dominant plants found in these areas are live oak and cabbage palm. The understory consists of saw palmetto and wax myrtle.

This community can occasionally flood, but is seldom inundated for more than 10-40 days a year. Although this community does not depend on fire, drier sites can occasionally tolerate low ground fires. Brazilian pepper is present along the

Preserve boundary in this community. Exotic plant species in this community are less than 25% of the cover.

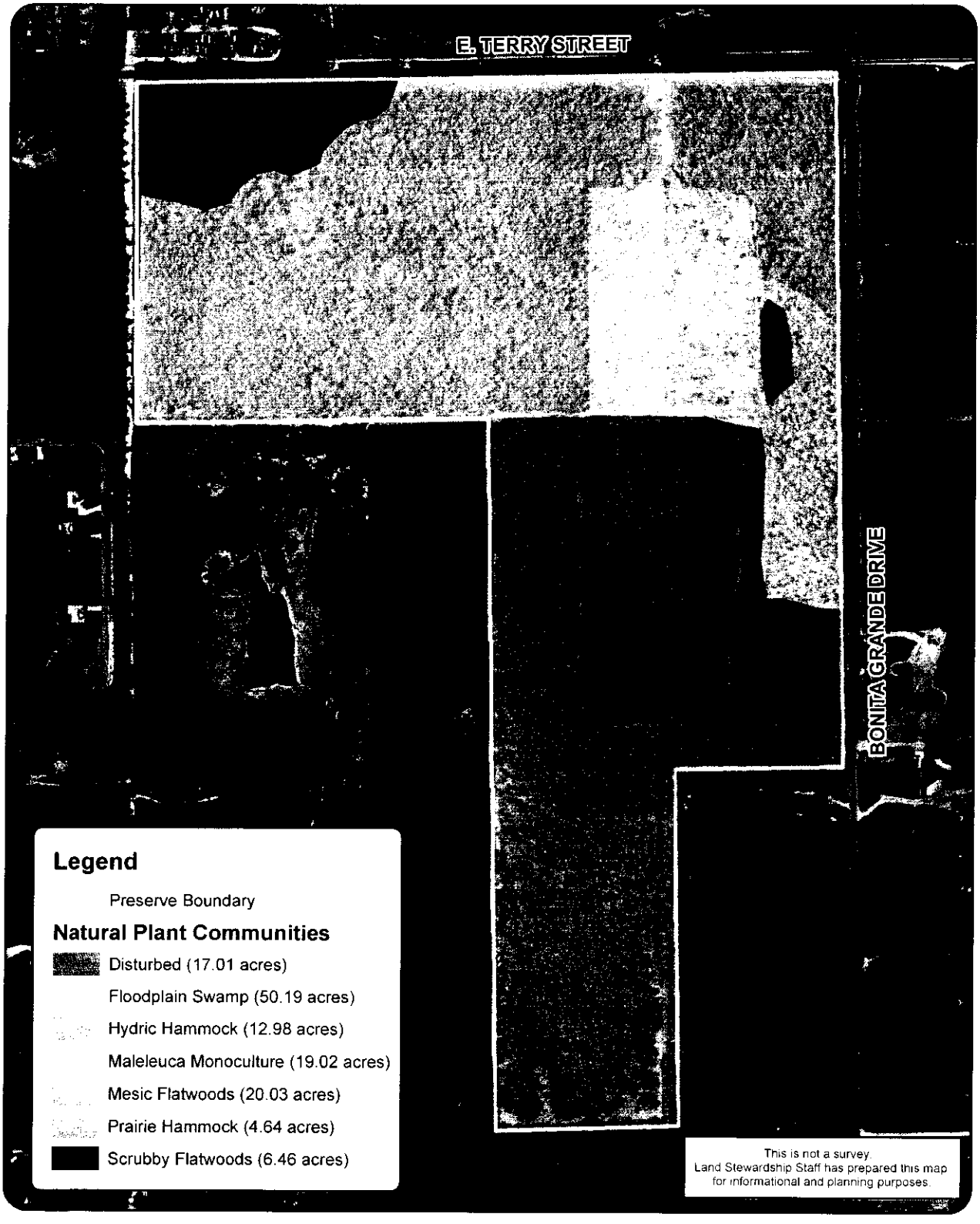
Disturbed – 17.01 acres, 13 % coverage of PLP

This site includes the 11 acre borrow pit and its surrounding area. There is a presence of exotics here, including melaleuca, downy rose myrtle, Brazilian pepper and Australian pine.

***Melaleuca* Monoculture – 19.02 acres, 14.6 % coverage of PLP**

These areas of the Preserve have been disturbed enough that melaleuca dominates the sites. There is minimal understory vegetation present.

Figure 7: Natural Plant Communities



iii. Fauna

The Preserve consists primarily of a large, borrow pit lake and surrounding forest that are a mix of cypress/pine habitat, pine flatwoods and oak hammocks. The lake, especially during the dry season, provides habitat for a number of birds including herons, egrets, sandpipers, killdeer (*Charadrius vociferous*) and black-necked stilts (*Himantopus mexicanus*). Alligators have also been seen on multiple visits. The surrounding woods have a variety of songbirds, grey fox (*Urocyon cinereoargenteus*) and gopher tortoises. Big Cypress fox squirrels (*Sciurus niger avicennia*) have been seen sporadically. See Appendix B for a list of wildlife documented at the Preserve. Wildlife species were recorded during various site visits during quarterly site inspections. The Preserve is surrounded by an expanding urban area and two fairly busy roads. This, combined with its small size makes it unlikely to provide habitat for larger mammals. Table 2 shows a list of exotic wildlife found at PLP. Both feral dogs and cats have been documented by staff using remote sensor cameras and observing tracks during site visits.

TABLE 2: EXOTIC/FERAL WILDLIFE AT PINE LAKE PRESERVE

Scientific Name	**Common Name**
Anolis sagrei	brown anole
Osteopilus septentrionalis	Cuban treefrog
Felis catus	house cat
Canis familiaris	feral dog

iv. Designated Species

There are a variety of listed animal and plant species found at Pine Lake Preserve (Table 3). For stewardship purposes, all plants and animals listed by the U.S. Fish and Wildlife Service (USFWS), Florida Fish and Wildlife Conservation Commission (FWC), Florida Department of Agriculture and Consumer Services (FDACS) and/or Florida Natural Areas Inventory (FNAI) will be given special consideration.

Typically, designated species will benefit from proper management of the biological communities in which they occur. However, some species may require additional measures to ensure their protection. Staff is currently researching monitoring methods to determine if management techniques on all Conservation 20/20 Preserves are effective. Management practices likely to benefit wildlife at the Preserve include exotic plant control, prescribed burning, trash removal, wildlife monitoring, restricting trails in certain areas and enforcement of no littering, no weapons and no motorized vehicles regulations.

Table 3: Listed Species Found at PLP and Their Designated Status

Scientific Name	Common Name	USFWS	FWC	FNAI	FDA
REPTILES					
Alligator mississippiensis	American alligator	T S/A	SSC	G5/S4	
Gopherus polyphemus	gopher tortoise		SSC	G3/S3	
BIRDS					
Egretta caerulea	little blue heron		SSC	G5/S4	
Egretta tricolor	tricolored heron		SSC	G5/S4	
Egretta thula	snowy egret		SSC	G5/S3	
Eudocimus albus	white ibis		SSC	G5/S4	
Elanoides forficatus	swallow-tailed kite			G5/S2	
Mycteria americana	wood stork	E	E	G4/S2	
Haliaeetus leucocephalus	bald eagle	T	T	G4/S3	
MAMMALS					
Sciurus niger avicennia	Big Cypress fox squirrel		SSC	G5T2/S2	
PLANTS					
Encyclia tampensis	butterfly orchid				CE
Tillandsia fasciculata var. densispica	stiff-leaved wild-pine, cardinal airplant				E
Tillandsia utriculata	giant airplant				E

KEY

USFWS-U.S. Fish & Wildlife Service
FWC-Florida Fish & Wildlife Conservation Commission
FDA-Florida Department of Agriculture & Consumer Services

CE - Commercially Exploited
E-Endangered
T-Threatened
T S/A-Threatened due to Similarity of Appearance
SSC-Species of Special Concern

FNAI-Florida Natural Areas Inventory

G-Global rarity of the species
S-State rarity of the species
T-Subspecies of special population

1-Critically imperiled
2-Imperiled
3-Rare, restricted or otherwise vulnerable to extinction
4-Apparently secure
5-Demonstrateably secure

The following is a brief summary of each species explaining why they are in decline. Unless stated otherwise, the reasons for the species decline and the management recommendations were obtained from Hipes et. al, 2000.

American Alligator
American alligators have recovered dramatically since the 1960's. There are even some populations large enough to support limited harvests. Pollution and destruction of wetlands are currently the main threat to this species. Protecting wetlands from ditching, filling and pollution are the management recommendations for this species.

Gopher Tortoise
Gopher tortoises are in decline throughout their range due to loss and degradation of habitat. This species is dependant on dry, upland communities which are often converted into urban and residential development, agriculture, citrus groves, mining and pine plantations. Additional threats include a highly contagious respiratory disease and human consumption.

Thirty five gopher tortoise burrows were found at PLP and on adjacent properties During an initial site inspection. The majority of the site is wet during the summer months and fire is infrequent. A few (<10) burrows have been documented in higher areas of the Preserve, such as the berms and in the mesic flatwoods. All burrows will be flagged in advance of any heavy equipment use. If restoration activities will destroy the burrows, the gopher tortoise relocation protocol located in the Land Stewardship Operations Manual (LSOM) will be followed.

Wading Birds

Little Blue Heron, Tricolored Heron, Snowy Egret
The little blue heron's (*Egretta caerulea*) and the tricolored heron's (*E. tricolor*) decline are due to loss of freshwater wetlands and alteration of their natural hydroperiod. There is also some indication that pesticides and heavy metal contamination may affect this heron. Like these herons, the snowy egret (*E. thula*) is declining throughout its range, and has been since the 1950's. Scientists believe that the main reason for this decline is the loss and alteration of wetlands where they forage.

White Ibis
Similar to the herons listed above, the white ibis (*Eudocimus albus*) is declining throughout its range, probably due to the reduction and degradation of wetlands as well as human disturbances to their rookeries.

Swallow-tailed Kite
Swallow-tailed kites (*Elanoides forficatus*) migrate to southwest Florida from South America in late February/early March for their nesting season that lasts through late July/early September. In the early 1900's, swallow-tailed kites

nested 21 states; today they only nest in 7 southeastern states. Habitat loss of nesting sites through development and conversion to agriculture are the major threats to this species.

Nesting behavior has been observed although nests have not been documented on the Preserve. In the future if it is discovered that they are nesting on the property, the nest trees will be protected from disturbance during breeding season if nests are observed and planned management activities that could disturb the nesting pair(s) will be postponed.

Wood Stork
Wood storks (*Mycteria americana*) are very sensitive to water levels in freshwater wetlands, as they require high concentrations of fish in fairly shallow water for foraging. Unnaturally high water levels during nesting seasons and extended droughts are both threats that wood storks face.

Bald Eagle
Bald eagle (*Haliaeetus leucocephalus*) numbers have steadily increased in Florida after a low of 120 active nests in 1973. Still, loss of habitat and human disturbance due to development is a primary concern for this species.

Big Cypress Fox Squirrel
The Big Cypress fox squirrel listed as a threatened species by FWC. They can be found from the Caloosahatchee River in Lee County south to Dade County. It is most often found in open pinelands, live oak forests, and stands of bigger bald cypress. Loss of habitat due to development, conversion of land to citrus farming and fire suppression are the main reasons for the decline in numbers of this species. Other factors such as hunting and population isolation due to development and roads have also influenced their decline (Ashton 1992).

Plant Species

Florida Butterfly Orchid
Although locally abundant (Brown, 2002), the Florida butterfly orchid (*Encyclia tampensis*) is designated as Commercially Exploited by the FDA. A plant that is designated as "Commercially Exploited" is considered to be threatened by commercial exploitation. Butterfly orchids may not be collected, injured or destroyed on public lands and strict limits for collection are permitted on private lands (with permission from the land owner).

Cardinal and Giant Airplants
Cardinal airplants (*Tillandsia fasciculata var. densispica*) and giant airplants (*Tillandsia utriculata*) are found in hammocks, cypress swamps and pinelands. Scattered plants have been documented in several portions of PLP. Threats to these plants include illegal collecting, habitat destruction and the exotic Mexican bromeliad weevil (*Metamasius callizona)* (Save, 2004). Now listed as

endangered, they were once considered common before the arrival of the weevil in Florida. Currently, scientists are researching biological control agents for the weevil. Staff will keep follow the research developments and work with scientists in the future if it is determined that these insects are affecting ephyphites and the U.S. Department of Agriculture (USDA) is in need of release sites.

Table 4 outlines some specific management and restoration activities at the Preserve that will be taken to protect these designated species. If additional listed species are documented on the Preserve they will be added to the list. A map with listed species burrow/nest locations will be created for personnel use only and will not be included in the plan.

Table 4: Management Recommendations for Designated Species

Species		Restoration Activities			Management Recommendations	
Scientific Name	Common Name	Exotic Control	Hydrologic Restoration	Prescribed Fire	Mark Location	Relocation
Alligator mississippiensis	American alligator	x	x		x (nests)	
Gopherus polyphemus	gopher tortoise	x		x	x (burrows)	??
Egretta caerulea	little blue heron	x	x			
Egretta tricolor	tricolored heron	x	x			
Egretta thula	snowy egret	x	x			
Eudocimus albus	white ibis	x	x			
Mycteria americana	wood stork	x	x			
Elanoides forficatus	swallow-tailed kite	x			x	
Halieaetus leucocephalus	bald eagle	x			x (nests)	
Sciurus niger avicennia	Big Cypress fox Ssuirrel	x		x	x (nests)	
Enycyclia tampensis	Florida butterfly orchid	x			x	x
Tillandsia fasciculata	cardinal airplant	x			x	x
Tillandsia utriculata	giant airplant	x			x	x

Restoration Activities:

Activities on the Preserve that will benefit and protect designated species for the long term.

Explanation of Management Recommendations:

Mark Location – location of individual plants, nest sites or burrows will be recorded using GPS for land stewardship staff knowledge and protection during restoration activities.
Relocation – a permit will be obtained to relocate any plant that could be damaged during exotic removal, if it is economically feasible. Gopher tortoises will be relocated if burrows could be damaged/flooded.

v. Biological Diversity

One of the major influences on the diversity of the Preserve is the borrow pit. A variety of bird species spend time wading and feeding here, especially in the winter during dry periods. The surrounding cypress/pine ecosystem also hosts a wide variety of native plant species, including orchids, ferns, cabbage palms and saw palmettos. Several species of birds find shelter in the palmetto understory, nest in the tall pines and forage in the grasses. During the wet season, the cypress/pine communties and borrow pit serve as a water storage area to help protect adjacent landowners from flooding.

Pine Lake Preserve has a great diversity of plant communities ranging from xeric to hydric. The northwest corner is a small scrubby flatwoods community that is dry and rarely floods. In the northeast corner, the floodplain swamp is dominated by cypress that holds a couple of inches of water through the wet season. Moving south across the property and the historic riverbed, it gets drier. The southwest corner is a prairie hammock with live oaks and cabbage palms that rarely floods. Although exotics are present on site, their presence is not great enough to have altered the ecosystem dramatically. After initial exotic plant control, native plants should recover quickly.

The integrity and diversity of PLP must be protected when and where possible. Land Stewardship staff will ensure this by implementing the following:

- Control of invasive exotic vegetation followed by annual maintenance to provide more suitable habitat for native species.
- Hydrologic restoration that will include filling and/or plugging certain ditches to slow water drainage and help resume natural hydroperiods.
- Alterations to the borrow pit to create basking and wading areas during the wet season.
- Implement a prescribed fire program to closely mimic the natural fire regimes for the different plant communities to increase plant diversity and insure the canopies remain open.
- Conduct on-going species surveys conducted by volunteers and staff to help catalogue and monitor the diversity that is present.
- Provide educational opportunities for visitors through both interpretive signs and programs.

C. Cultural Resources

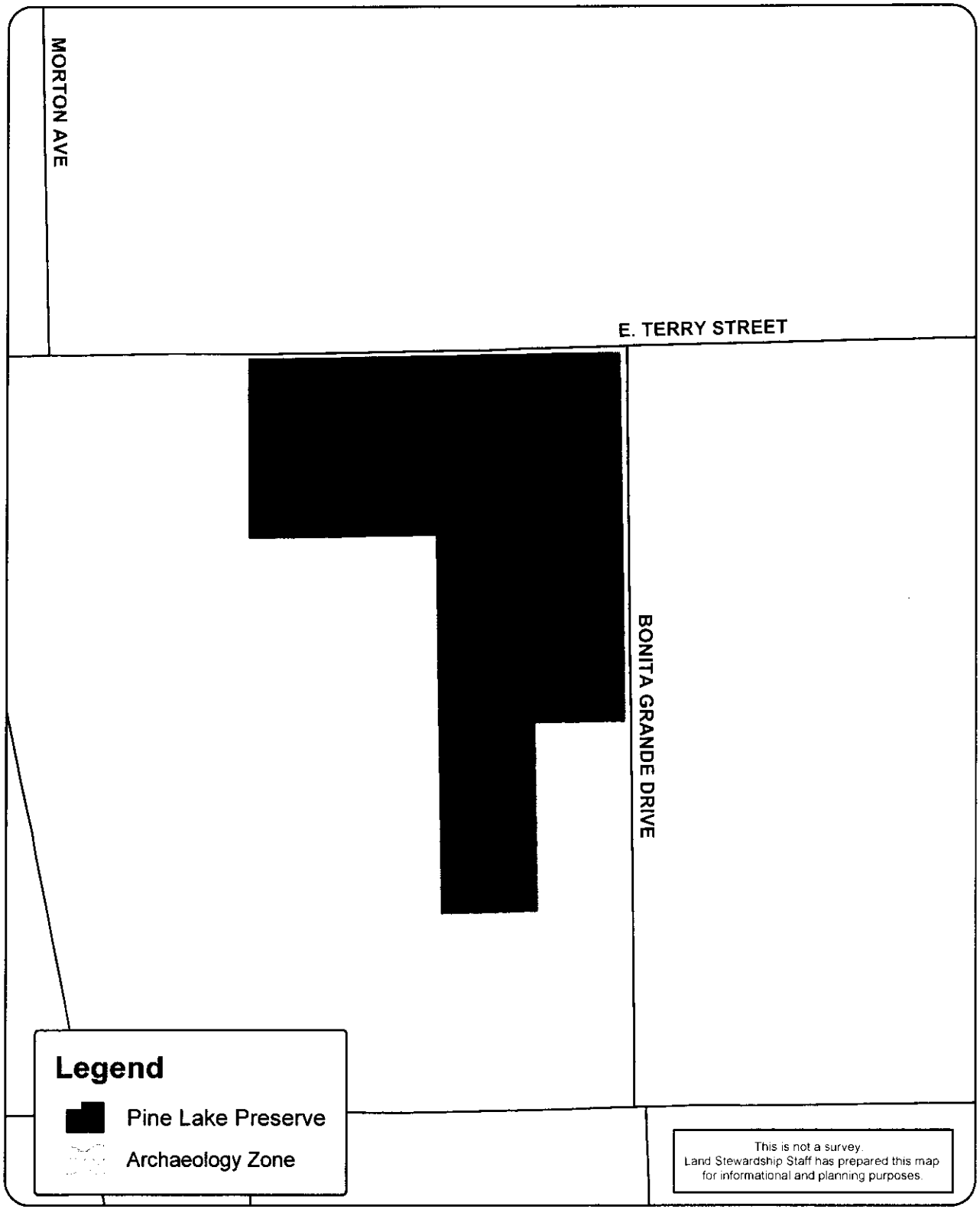
i. Archaeological Features

In 1987, Piper Archaeological Research, Inc. conducted an archaeological site inventory of Lee County. They were able to identify 53 sites increasing the total

number of known archaeological sites in Lee County to 204. They also created a site predictive model and archaeological sensitivity map for the county that highlighted potential areas likely to contain additional archaeological sites. A large portion of Pine Lake Preserve lies within the study's "Sensitivity Level 2" area (Figure 8). The study defines this level as "areas that contain known archaeological sites that have not been assessed for significance and/or conform to the site predictive model in such a way that there is a high likelihood that unrecorded sites of potential significance are present. If these areas are to be impacted, then they should be subjected to a cultural resource assessment survey by a qualified professional archaeologist in order to 1) determine the presence of any archaeological sites in the impact area and/or 2) assess the significance of these sites."

No shell middens have been observed on PLP, although there were mounds identified close to the Preserve and associated with the Imperial River (Van Meter, 2005). There has already been considerable soil disturbance on PLP during the creation of the many ditches and the borrow pit lake. If there is major soil disturbance during restoration of the Preserve or during the development of public use facilities that is not located in these areas, a professional archaeologist will be hired to conduct a survey of the area to be impacted. If evidence of shell middens or other artifacts are found in the area, the Division of Historical Resources will be immediately contacted and protection procedures will comply with the provision of Chapter 267, Florida Statutes, Sections 267.061 2(a) and (b). Collection of artifacts and/or any disturbance of the archaeological site will be prohibited unless prior authorization has been obtained from the Department of State, Division of Historical Resources. Also, the site will be managed in coordination with recommendations of the Division of Historical Resources and, if necessary, the site will be kept confidential with periodic monitoring for impacts. If any significant archaeological resources are found and confidentiality is not necessary, they will be incorporated into a public educational program.

Figure 8: Archaeological Sensitivity Map



ii. Land Use History

There is no documentation of historical uses of Pine Lake Preserve until late in the 20th century. General land use patterns for inland areas of southwest Florida are likely to apply to the Preserve and surrounding areas. Native Americans lived in southwest Florida for at least 2,000 years before the Europeans. The Calusa Tribe would likely have used the Imperial River, which has a tributary in the southern portion of PLP.

Starting in the mid 1800's both the Seminole Tribe and European settlers lived a subsistence existence in the region. Army crews were sent into southern Florida on exploratory missions. When they first arrived at the Imperial River, they named it "Snake River" to reflect the wildlife they encountered. They set up a permanent supply camp on the south bank of the river (Briggs, 1976).

In the 1870's Hamilton Diston, an entrepreneur from Philadelphia, Pennsylvania purchased 6 million acres of land in this area for 25 cents per acre. This may have included the Preserve, along with what is now Bonita Springs. He surveyed the land and began to dig canals to drain the wetlands. A town built up around the Army camp was named Survey after the work being conducted in the area and the Snake River was renamed Survey River. Survey was described as being like the "Wild West" and the citizens "Ate what didn't eat them" (Koltinsky, 2003). Although the town was a little over 2 miles to the west of Pine Lake Preserve, it is possible that the citizens of Survey hunted and fished at PLP.

In 1912 investors purchased Survey and 5,000 acres surrounding it. They platted the land, added more roads and canals and renamed the town Bonita Springs and the river became the Imperial River. There is some disagreement as to why these names were chosen, but it probably had to do with picking names that would attract new residents.

By the 1920's there were at least 3 sawmills in Bonita Springs, one located on Bonita Beach Road that was operated from dawn to dusk. The Preserve could have been logged for the first time in the 1920's to provide lumber for the rapidly growing town. The area between Bonita Beach Road and Immokalee Road (east of the Preserve) was heavily logged in the 1950's (Cox, 2005). PLP was more than likely logged by the 1950's.

Historical aerials (Figures 9-11) show that Pine Lake Preserve was nearly unchanged through from 1944 through 1958. There was just one small dirt road that crossed over the southern arm at this time.

Development in the area began in 1960 when the Kehl Canal was constructed. This canal was part of a series of canals and roads created for Suncoast Acres, a failed residential development located in the southern portion of the Flint Pen

Strand and approximately 3 miles east of the Preserve. By 1966 large dirt roads were constructed along the north and east boundaries of PLP, as well as two additional north-south roads traveling through the interior. The land on both sides of the Imperial River branch was cleared. The thick melaleuca monoculture growing along the banks is probably a result of the clearing and hydrologic changes. Another result of the hydrologic changes to the area is the invasion of slash pine trees into the floodplain swamp community. Tree cores from this site show that the south Florida slash pine here are approximately 35 years old.

Between 1966 and 1972, the dirt roads narrowed due to vegetation regrowth and the tree canopy appears to be much more dense. Few changes occurred at Pine Lake Preserve until the early 1980's when the borrow pit was dug. Soil from this pit may have been used in the construction of I-75, which was completed in this area in 1981, or it may have been sold for other off-site purposes. The paving of other dirt roads surrounding the Preserve occurred in 1981 (E. Terry Street), 1983 (Bonita Grande Road) and 2004 (Kent Road). In the early 1990's, it was leased for cattle and fenced.

Figure 9: 1944 Historical Aerial Photograph

Figure 10: 1953 Historical Aerial Photograph

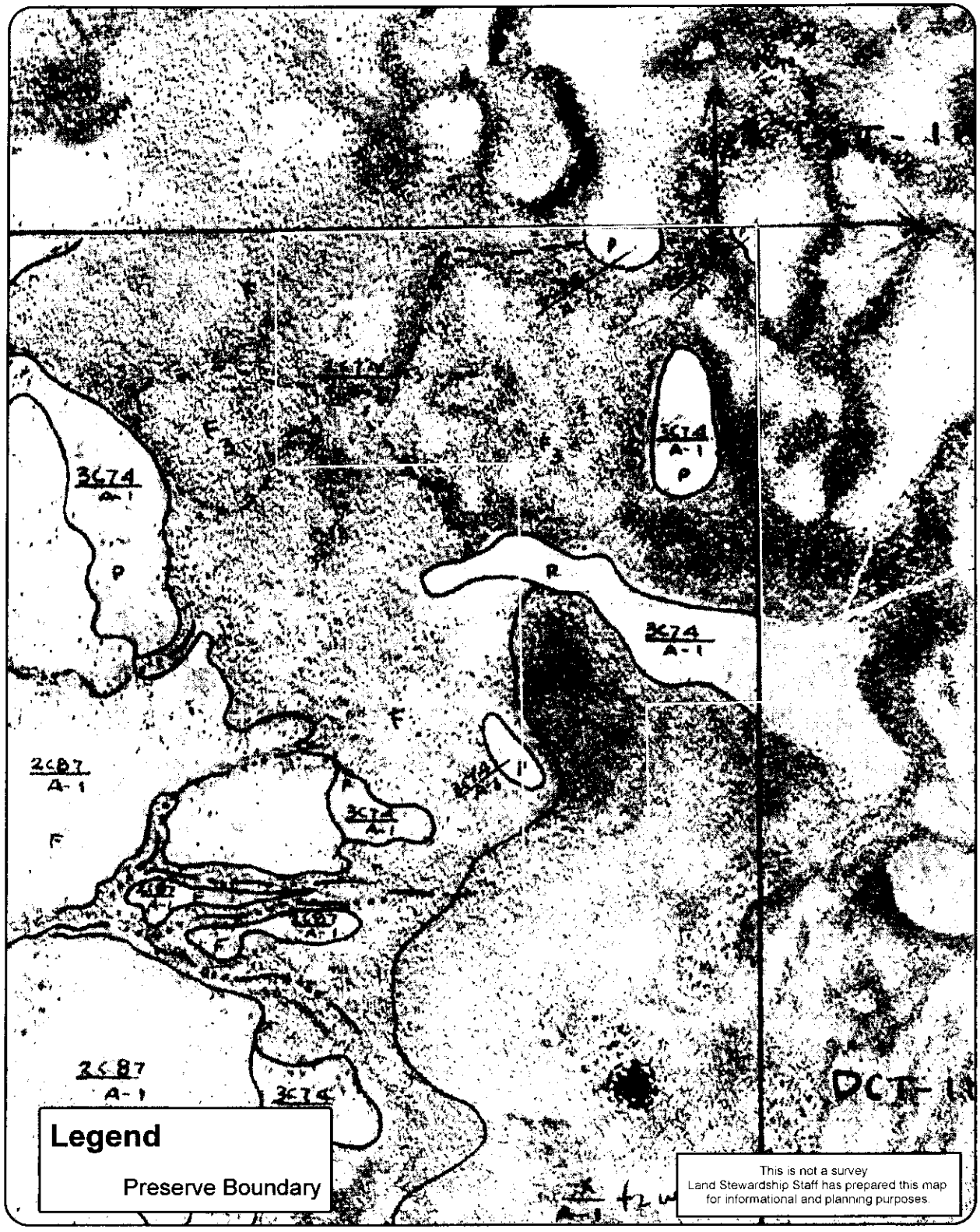
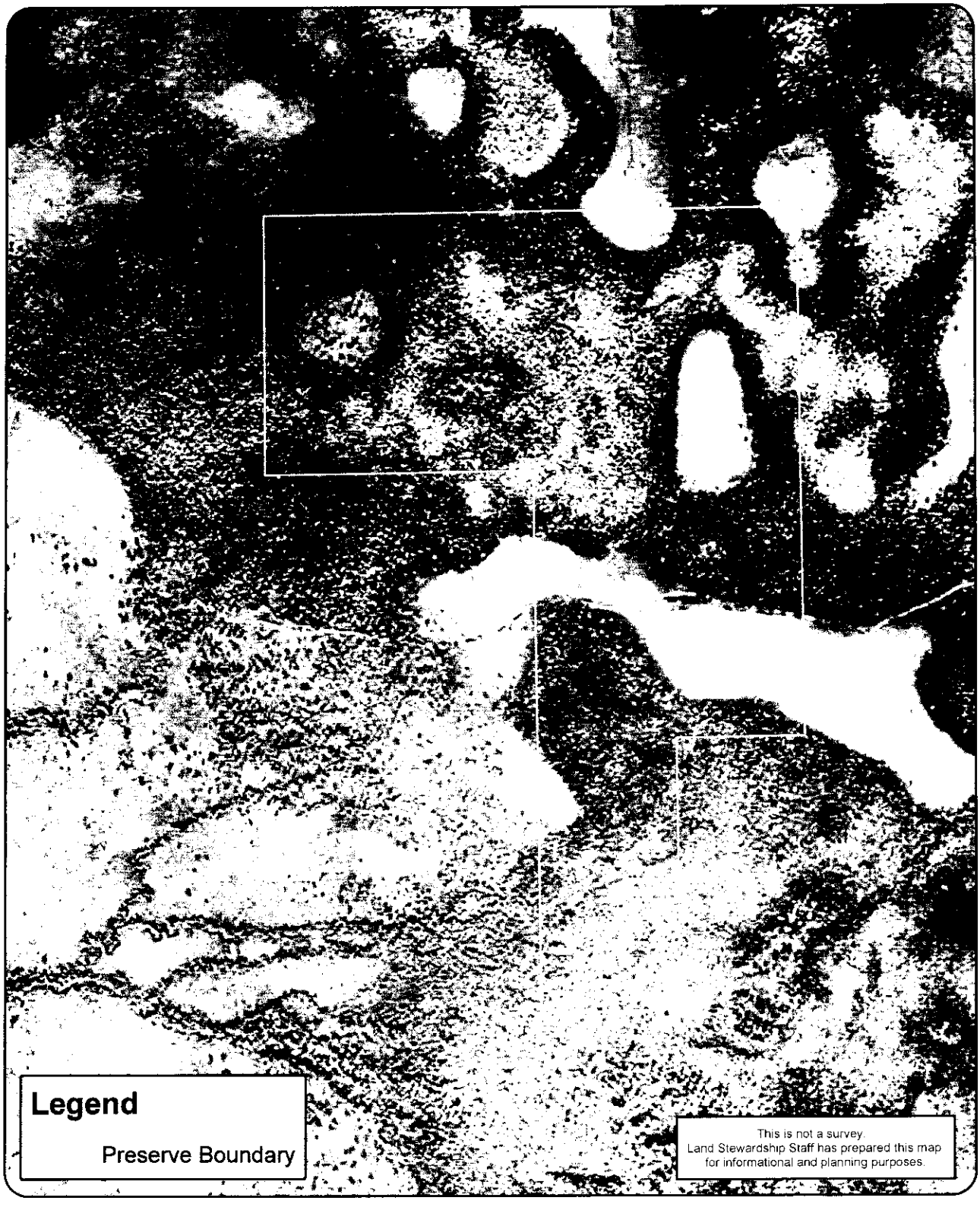


Figure 11: 1958 Historical Aerial Photograph



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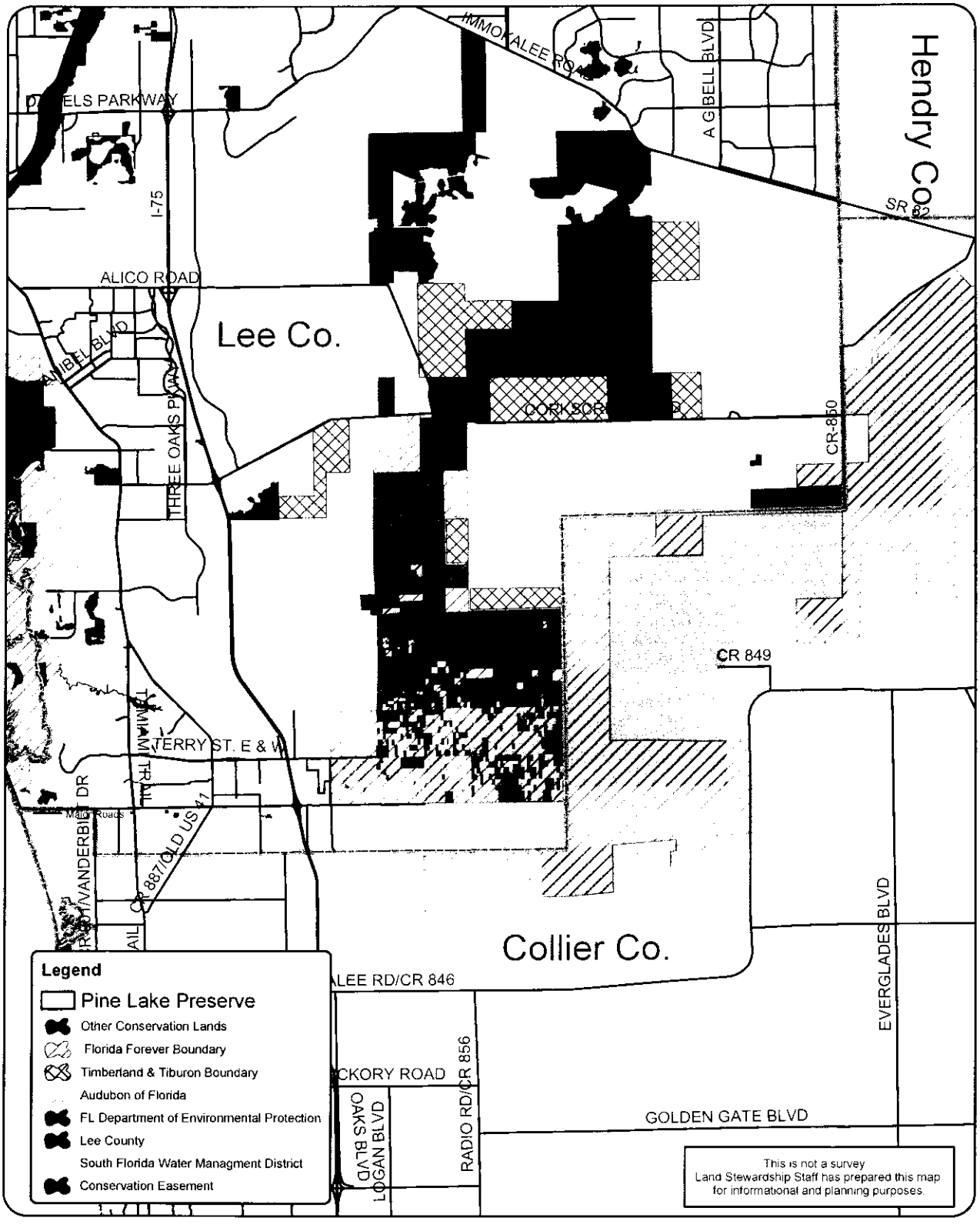
iii. Public Interest

The major public interest at Pine Lake Preserve is the Land Stewardship staff's plans for public use of the Preserve. A new YMCA has been constructed adjacent to the west boundary of PLP. Both YMCA staff and the Director of Community Development for the Bonita Bay Group have shown a strong interest in the future public use plans and how they will be able to utilize the Preserve. See the Public Access and Resource Based Recreation section of this plan for the proposed amenities to be provided.

Pine Lake Preserve is also located adjacent to the boundary of the Corkscrew Regional Ecosystem Watershed (CREW) located within Florida Forever's acquisition area (Figure 12). CREW properties in this area have been acquired through the Florida Forever program and Lee County. The Florida Department of Environmental Protection (FDEP), South Florida Water Management District (SFWMD) and the U.S. Army Corps of Engineers (USACE) are interested in the acquisition and restoration of this area of the County because of the current impacts that development in the area is having on both the CREW project and the Corkscrew Swamp Sanctuary. The "Southern CREW Project Additions and Imperial River Flowway" are considered Critical Projects within the Everglades Restoration Project. Restoration plans for these agencies include work on the Kehl Canal (located on a portion of the Preserve's boundaries) and the headwaters of the Imperial River. Their primary goals include re-establishing historical flow patterns and hydroperiods, reducing nutrient loading and pollutants from reaching the Imperial River and Estero Bay and increasing aquifer recharge and reducing flooding to residents of the area. Although the Preserve is on the boundary of the acquisition area, restoration will benefit these agency's efforts.

Figure 12: Conservation Lands Map



V. FACTORS INFLUENCING MANAGEMENT

A. Natural Trends and Disturbances

Natural trends influencing stewardship at Pine Lake Preserve include hurricanes, flooding, occasional freezes, wildfire, and the pattern of wet and dry seasons. Implementation of the Management Action Plan will address the possibility that these natural trends and disturbances may occur and their influence on stewardship at Pine Lake Preserve. For example, a tropical storm or hurricane could damage large amounts of vegetation. It may be necessary to remove or mulch this downed vegetation if it increases the chance of negative impacts to wildlife habitat from a wildfire.

Wildfires caused by lightning are a natural occurrence in Florida. The Florida Division of Forestry (DOF) (Caloosahatchee District) and Lee County Parks and Recreation are developing a wildland firefighting protocol for County preserves. DOF has been given a map of the Preserve with locations of gates, firebreaks and management units. Whenever possible DOF will utilize existing firebreaks to contain wildfires at PLP. No new fire breaks, such as plow lines, will be created unless there is potential for the wildfire to harm property outside the Preserve boundaries. This agreement between DOF and the County will protect PLP from the potential damage associated with emergency firefighting equipment. Land Stewardship staff will lead periodic site visits in order to familiarize DOF with the Preserve and any current management efforts. A comprehensive C20/20 fire plan, to be completed in 2005, will help decrease the impact of catastrophic wildfires on preserves and neighboring lands.

Management (exotic plant control, prescribed burning, etc.) of PLP is influenced by seasonal hydroperiods. The Land Stewardship Operations Manual's (LSOM) exotic plant prescription form will be used to define the conditions under which management will occur. Care shall be taken to prevent herbicide from running off during a typical summer thunderstorm so as not to affect non-target plants, such as submerged vegetation. Only herbicides approved for aquatic application will be used for treatment of vegetation in standing water or where flooding may occur. The use of heavy equipment will be limited to the dry season for the majority of the site. The timing of prescribed burns will also be influenced by seasonal rain, weather and wind patterns.

Seasonal wet and dry periods also alter wildlife utilization of the borrow pit lake. During the winter dry months, a variety of wading birds are found in the borrow pit. The water levels are too high in the wet summer months to allow feeding by these birds. Creation of a littoral zone at the borrow pit will provide feeding areas for wading birds year round.

B. Internal Influences

A variety of human influences have dramatically affected Pine Lake Preserve. Currently, the main internal influence is cattle grazing. Presently, there are only two bulls grazing on the Preserve. There is one small (50' x 50') abandoned cattle pen at the southwest corner of the borrow pit that is overgrown with vegetation. There are no other interior fences, so the bulls may range throughout the Preserve. Once restoration work on the borrow pit and ditches begins, the cattle lease will be terminated to prevent trampling or grazing of plantings.

In November 2000, the previous land owners and SFWMD made an agreement to use part of the property for a drainage ditch on the west side of the property along Kent Road, in exchange for improving Kent Road. A copy of this agreement can be seen in Appendix C.

It is possible that the Preserve will be closed to the public during certain management activities. Potential closures include stewardship activitieswhich utilize heavy machinery for invasive exotic plant removal, herbicide application or prescribed burning. If the Preserve is closed, signs will be posted at the access point off Kent Road.

Bonita Springs Utilities (BSU) contacted Land Stewardship staff about conducting off-site mitigation on the Preserve in 2001, however, no mitigation occurred. In 2004, Bonita Springs Fire Control and Rescue District (BSFCD) used PLP for off-site mitigation of their new fire station located to the east of the Preserve. This mitigation work primarily consisted of berm cuts to increase water flow through the historic river channel on the southern portion of the Preserve.

C. External Influences

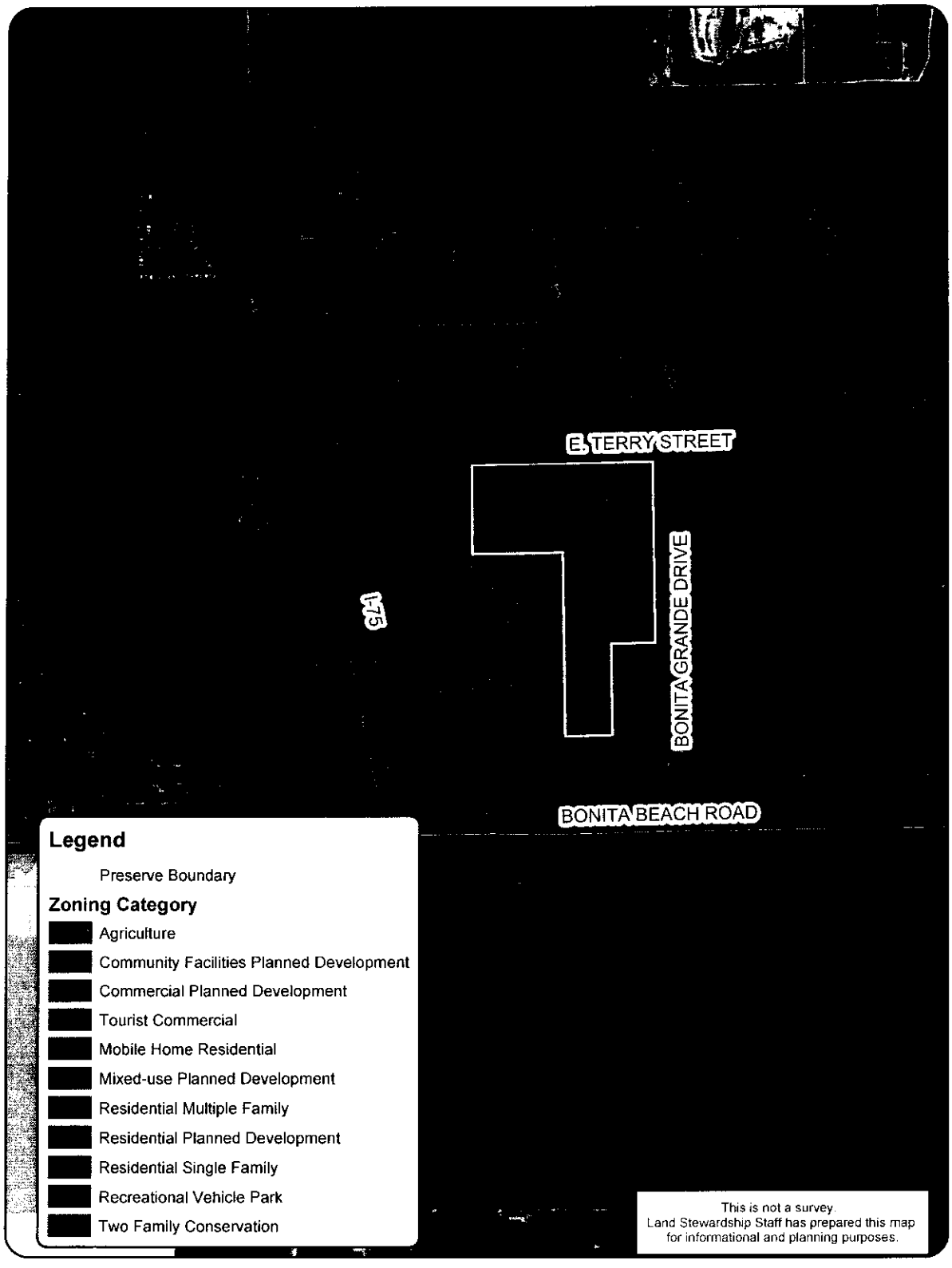
Residential development is occurring in the area to the west of the Preserve. A new YMCA has been constructed immediately to the west of the Preserve and with the recent improvement of Kent Road, further development is likely. There is a mobile home park on the northeast corner of the Preserve, and the parcels to the north and east are zoned agricultural. The parcel on the southern boundary is currently zoned for agriculture and has been purchased by developer with plans for a Wal-Mart (Figure 13). They have applied for a zoning change to Commercial Planned Development. In their plans, the northern portion of their parcel would be used for mitigation along the Kehl Canal and placed under a conservation easement. This development is in the planning process and if not approved, Land Stewardship staff will work with any future development to ensure any impacts to the Preserve as a result of development either have a negligible or positive affect on PLP. The majority of the land to the east of the Preserve is included in the CREW project and is protected as conservation lands (Figure 14).

In 2004 a Bonita Springs Fire Station was constructed near the southeast corner of the property on the east side of Bonita Grande Dr. The fire district made two berm cuts on the historic river channel on PLP as part of the floodplain compensation for their new station. The fire district used the property to the north, owned by SFWMD, for flood protection and wetland mitigation for the construction of the new fire station.

The proposed C.R. 951 extension runs along the eastern boundary of the Preserve along Bonita Grande Drive (Appendix D). This project is in the planning phase and staff will work on with DOT to ensure the least amount of impact to the Preserve. The final decision on alignment in this area is scheduled for September 2005.

Feral cats and dogs have been documented on numerous occasions at PLP. Large dog tracks are often seen on the sandy roads and around the borrow pit lake. In March 2005, staff set up motion cameras for two weeks and pictures of two large dogs and a feral cat were taken at night. Staff will work with Lee County Animal Services to have them trapped and removed.

Figure 13: Zoning Categories



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Pine Lake Preserve

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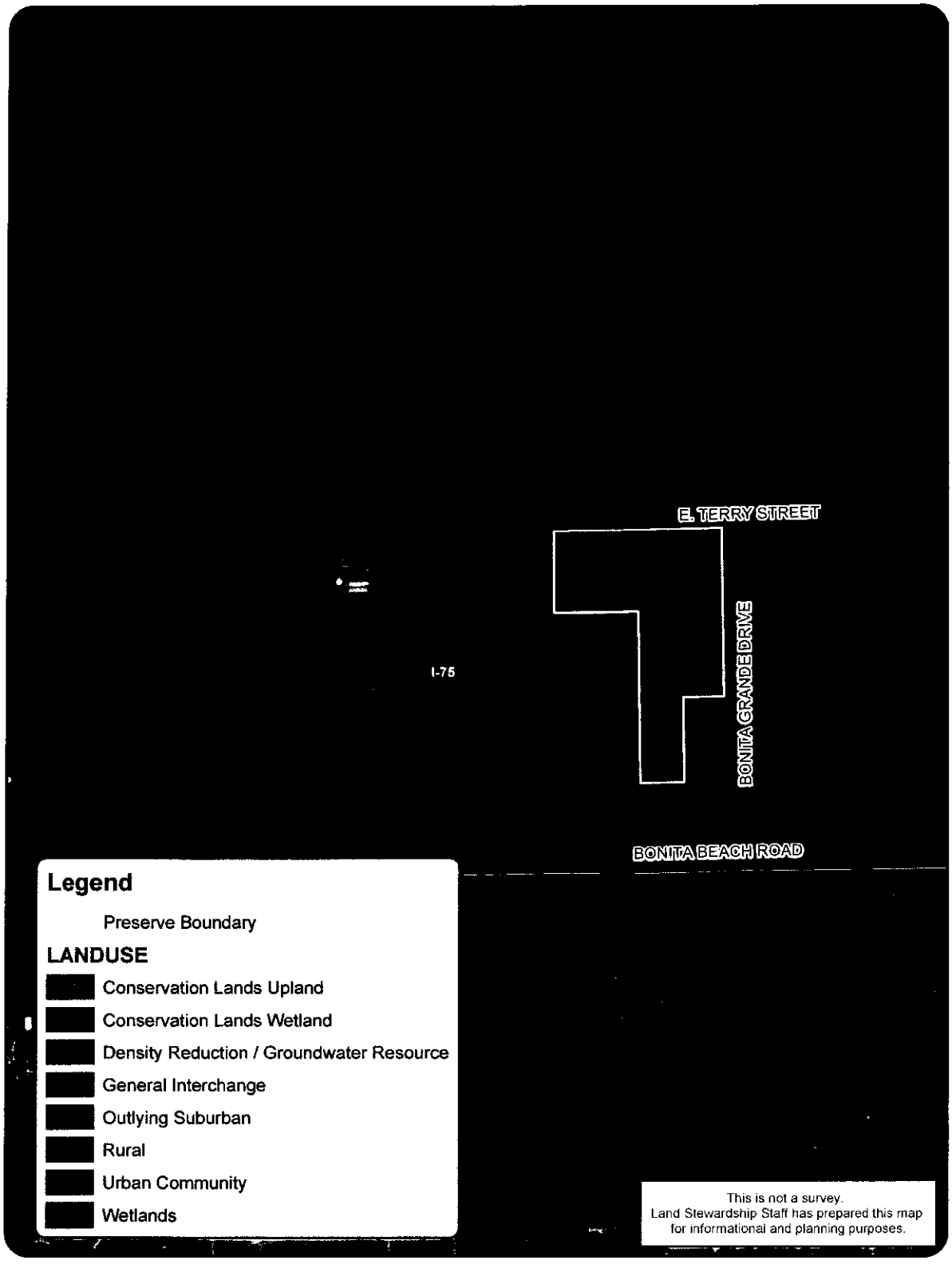
management plan\PLP_zoning.mxd

Prepared on: 06/06/05. by lboyd@leegov.com

Figure 14: Land Use Categories



D. Legal Obligations and Constraints

i. Permitting

Land stewardship activities at Pine Lake Preserve will involve obtaining permits from appropriate agencies. Once exotic plants have been removed from the upland portions of the Preserve, prescribed fire will be used as a management tool and will require permits from the DOF. The proposed hydrologic improvements will require permits from the FDEP, USACE and SFWMD. If necessary, a consultant will be hired to assist with the permitting process.

ii. Relationship to Other Plans

The Lee Plan, Lee County's comprehensive plan, is designed to depict Lee County as it will appear in the year 2020. Several themes have been identified as having "great importance as Lee County approaches the planning horizon". (Lee County, 2003). These themes are:

- The growth patterns of the County will continue to be dictated by the Future Land Use map.
- The continued protection of the County's natural resource base.
- The diversification of the County's traditional economic base.
- The expansion of cultural, educational and recreational opportunities.
- A significant expansion in the County's physical and social infrastructure.

The entire Lee Plan can be found on the Internet at: http://www.lee-county.com/dcd1/Leeplan/Leeplan.pdf. The three chapters that support the management of Pine Lake Preserve are **Chapter IV – Community Facilities and Services, Chapter V – Parks, Recreation and Open Space** and **Chapter VII – Conservation and Coastal Management**.

Chapter IV: Community Facilities and Services provides that the planned hydrologic restoration of some of the ditches on the northern portion of the property, as well as the redirection of water flow from the Kehl Canal into the historic river channel on the southern arm of the Preserve will follow **Policy 40.1.4**. "The county will examine steps necessary to restore principal flow-way systems, if feasible, to assure the continued environmental function, value and use of natural surface water flow-ways and associated wetland systems."

Chapter V provides that Land Stewardship staff will ensure that any public use facilities and recreational opportunities will comply with **Goal 60: Park Planning and Design**, which requires that parks are planned, designed and constructed to comply with the best professional standards of design, landscaping, planning and environmental concern. Staff will also work to provide, whenever staffing and

funding permit, appropriate environmental programs to the public in order to meet **Goal 61: Environmental and Historic Programs**.

Chapter VII: Conservation and Coastal Management, and within **Objective 74.1: Environmentally Critical Areas** provides that Lee County Land Stewardship staff has the responsibility of managing to conserve and enhance the natural functions of environmentally critical lands such as the wetland habitats and surrounding uplands found at PLP.

Chapter VII, Objective 77.1: Resource Management Plan, **Policy 77.1.1**, **Section 4e**, states that this Stewardship Plan is written for the long-term maintenance and enhancement of the Preserve's health and environmental integrity. Included within this plan are measures to address any necessary people management (e.g., fences and signage to prevent incompatible uses); surface water management and restoration; ecosystems restoration; litter control; fire management; invasive exotic plant and animal control; and, where appropriate, compatible recreational opportunities. Additionally, the plan will address how maintenance will be funded.

Chapter VII, Objective 77.3: Wildlife provides that Land Stewardship staff is directed to maintain and enhance the fish and wildlife diversity for the benefit of a balanced ecological system by following **Policy 77.3.1** preserving uplands in and around preserved wetlands to provide habitat diversity, enhance edge effect and promote wildlife conservation. Same chapter, **Objective 77.10,** Removing invasive exotic plants, initiating a prescribed fire regime and creating a wide littoral zone on a portion of the borrow pit lake will all follow this policy.

Policies 77.10.1 and **77.10.2 Wood Stork** recommends that Land Stewardship staff continue to document wood stork utilization of the Preserve and ensure that this stewardship plan follows USFWS's "Habitat Management Guidelines for the Wood Stork in the Southeast Region". This would primarily focus on the hydrologic restoration projects to improve the habitat to function as a more natural system and monitoring their effect on use of the Preserve by wading birds.

E. Management Constraints

The main management constraints for this Preserve will be conducting land stewardship activities with the brief dry season and the coordination of management activities and recreational use.

Pine Lake Preserve is very wet most of the year. January though April are typically the driest months. Management activities will normally need to be conducted in these months. During periods of high water, access to the Preserve should be limited to the Kent Road gate in the western arm of the

Preserve. There is an elevated farm road that is typically accessible in high water.

Once exotic plants have been removed from or controlled within the Preserve, prescribed fire will be an important management tool. The urban area to the west of the Preserve, including the YMCA, will be a challenge for burning. Smoke management will also need to take into account the development on Bonita Beach Road and Interstate 75.

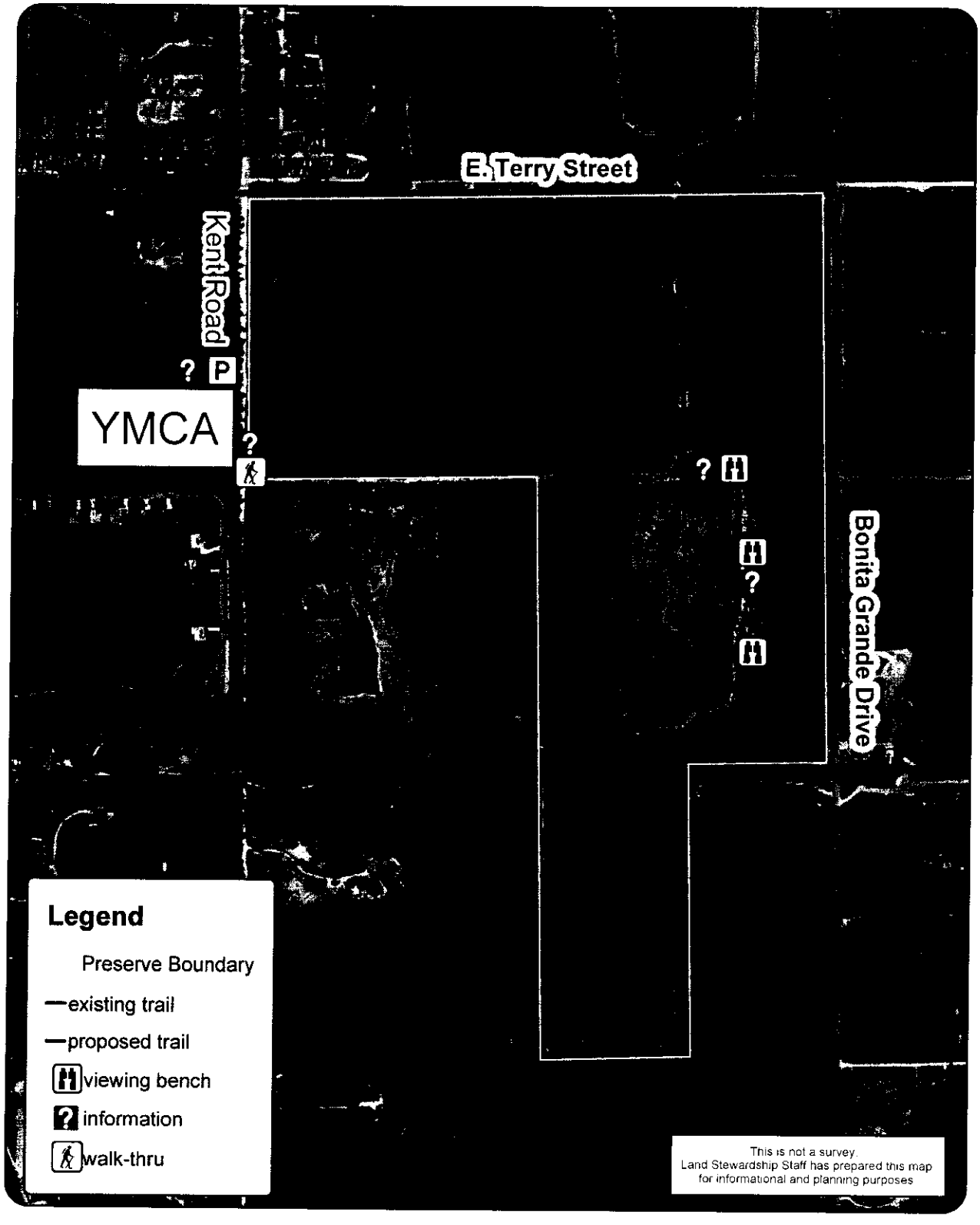
F. Public Access and Resource Based Recreation

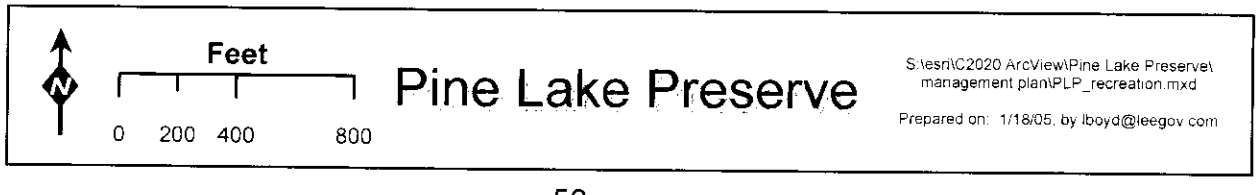
Historically, there has been little recreational activity at Pine Lake Preserve. The new YMCA at the corner of Kent Road and E. Terry Street may add an increased interest to recreational facilities on the Preserve. The Bonita Bay Group and the YMCA are interested in being involved with any public use plans at the Preserve. They have agreed to allow Preserve visitors to use their parking area (See Figure 15) so no new parking facilities will be needed at the Preserve.

There is a cattle lease on the Preserve, and until it is terminated, there is no public access. Due to the small size of the Preserve, public access will be delayed until initial exotic removal/control is complete. Activities at the Preserve will include hiking, bird watching and nature study. A trail in the western arm of the Preserve will be created as a loop-trail to the borrow pit with other hiking trails on roads and firebreaks. See Figure 15 for proposed hiking trails. Final trail locations will be field located to ensure compatibility with listed species. Volunteers will be utilized to help with marking and maintaining the trail. Trails may be closed seasonally or during management activities. Information and trail closures will be placed in the lobby of the YMCA and on an informational kiosk in the parking lot of the YMCA near the access point to the Preserve. Proposed trails will avoid sensitive soil types such as those with recreational restrictions. Due to the small size, flooding patterns and soil types of the Preserve, there will be no equestrian or bicycle use.

The borrow pit provides an excellent spot for bird watching and photography. Benches will be placed around existing vegetation for shade. If no vegetation is present, native vegetation will be planted to create shade. Interpretive signs will be placed near the benches that alert visitors to the types of wildlife typically seen and/or information on about prescribed fire, wetlands and the plant communities found at the Preserve. See Figure 15 for proposed locations benches and informational signs. Working with YMCA staff, Land stewardship staff may conduct educational field trips.

Figure 15: Conceptual Master Site Plan





G. Acquisition

Pine Lake Preserve was purchased through C20/20 in November 2000 for $1,950,000 after being nominated to the program in the summer of 1999.

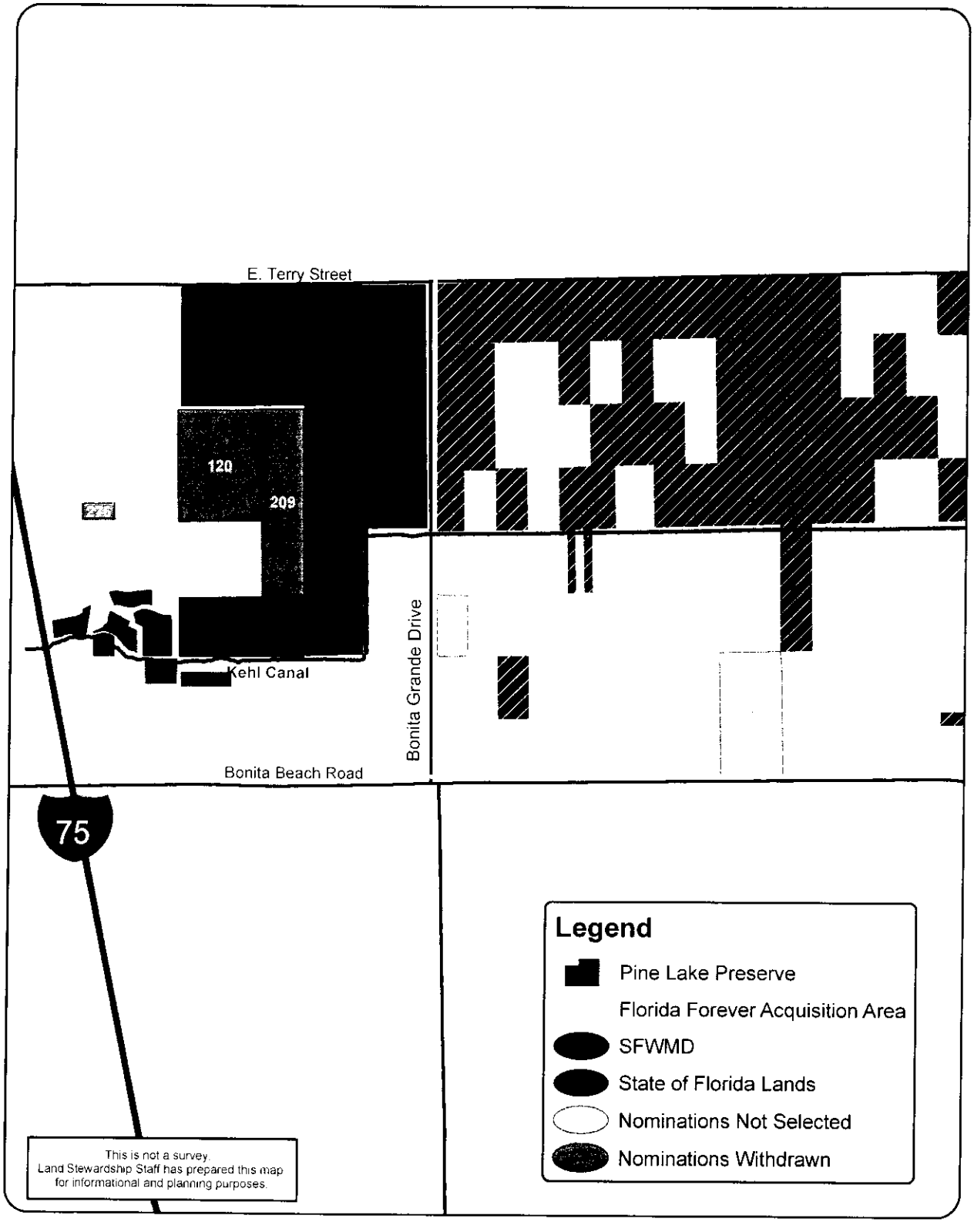
The future land use for the majority of the Preserve have been changed to "Conservation Lands" and it is zoned as agriculture "Ag-2". The STRAP number for the property is 31-47-26-06-00009.0010.

Two other properties adjacent to the Preserve, nominations 120 and 209, were also nominated to the C20/20 program (Figure 16). They were both withdrawn in the spring of 2003 because the Division of County Lands and the landowner were not able to reach an agreement on the price. Land Stewardship staff feels that acquiring these two parcels would be beneficial to increase the size of the Preserve.

There have been three additional nominations, 15, 179 and 276, which are not adjacent to the Preserve, but within a mile of its boundaries. Nomination 15 was 20-acres and was evaluated in 1997. The Conservation Land Acquisition and Stewardship Advisory Council (CLASAC) and County Staff decided not to pursue this property for acquisition because of its small size and isolation. Nomination 179 is a 5-acre parcel that the Bonita Springs Fire Control & Rescue District (BSFCD) proposed to swap with 5 acres of the existing Pine Lake Preserve. After much consideration, an arrangement was not pursued. Finally, Nomination 276, located west of the Preserve was nominated in 2005 and withdrawn when a neighbor decided to purchase the parcel.

There is additional undeveloped land in the vicinity of PLP that would be beneficial to pursue for acquisition. The land north of the Kehl Canal has been designated as Density Reduction; Groundwater Resource (DRGR). This land use category was created in 1991 in an agreement between the Florida Department of Community Affairs and Lee County in an effort to protect the recharge capabilities of the surficial and ground water aquifers. This land use restricts development to 1 unit per 10 acres. Purchasing DRGR land between the Kehl Canal and E. Terry Street would be beneficial for this purpose as well as helping to connect the conservation lands in this area. Pine Lake Preserve is also adjacent to the southwest boundary of the state's Florida Forever's acquisition area. Funding from the Water Resource Development Act (WRDA) was used to assist the State of Florida and Florida Forever with land purchases for the CREW Trust. Purchasing land in this area is a high priority for future acquisition for the County, the State of Florida and CREW Land and Water Trust.

Figure 16: Acquisition Map



VI. MANAGEMENT ACTION PLAN

A. Management Unit Description

Pine Lake Preserve has been divided into 6 management units utilizing existing roads and firebreaks (Figure 17).

Management Unit 1 – 22.5 acres
This Unit comprises the entire southern arm of the Preserve. It includes the historic Imperial River channel and its floodplain. It is bordered on the east and south sides by the Kehl Canal and to the west by SFWMD property. The northern boundary is an abandoned road. The majority of the Unit is a hydric hammock community with a small amount of prairie hammock at the southern edge. Exotic levels are below 25%. Management activities in this Unit will focus on exotic removal/control and restoring flow to the historic river channel.

Management Unit 2 – 9.3 acres
Management Unit 2 is located to the southeast of Pine Lake. The Unit is primarily mesic flatwoods with less than 25% exotic coverage. The southern portion contains Brazilian pepper and downy rose myrtle and the northern section contains melaleuca. The Kehl Canal borders the southern portion of this unit. A large berm along the canal has heavy Brazilian pepper cover. The northern boundary is a firebreak that runs from the east boundary to the borrow pit separating it from Unit 3. Management activities here will focus on exotic control and prescribed fire.

Management Unit 3 – 14.4 acres
Management Unit 3 is located in the northeast corner of the Preserve. It is bordered to the north by E. Terry St., to the west by Unit 5 and a farm road, to the south by a firebreak and Unit 2 and to the east by Bonita Grande Drive The northern portion is flood plain swamp with a mix of south Florida slash pine. This part contains less than 25% exotic invasion. The southern arm along Bonita Grande Drive is a melaleuca monoculture. Management activities here will focus on exotic control and hydrologic restoration in the cypress area.

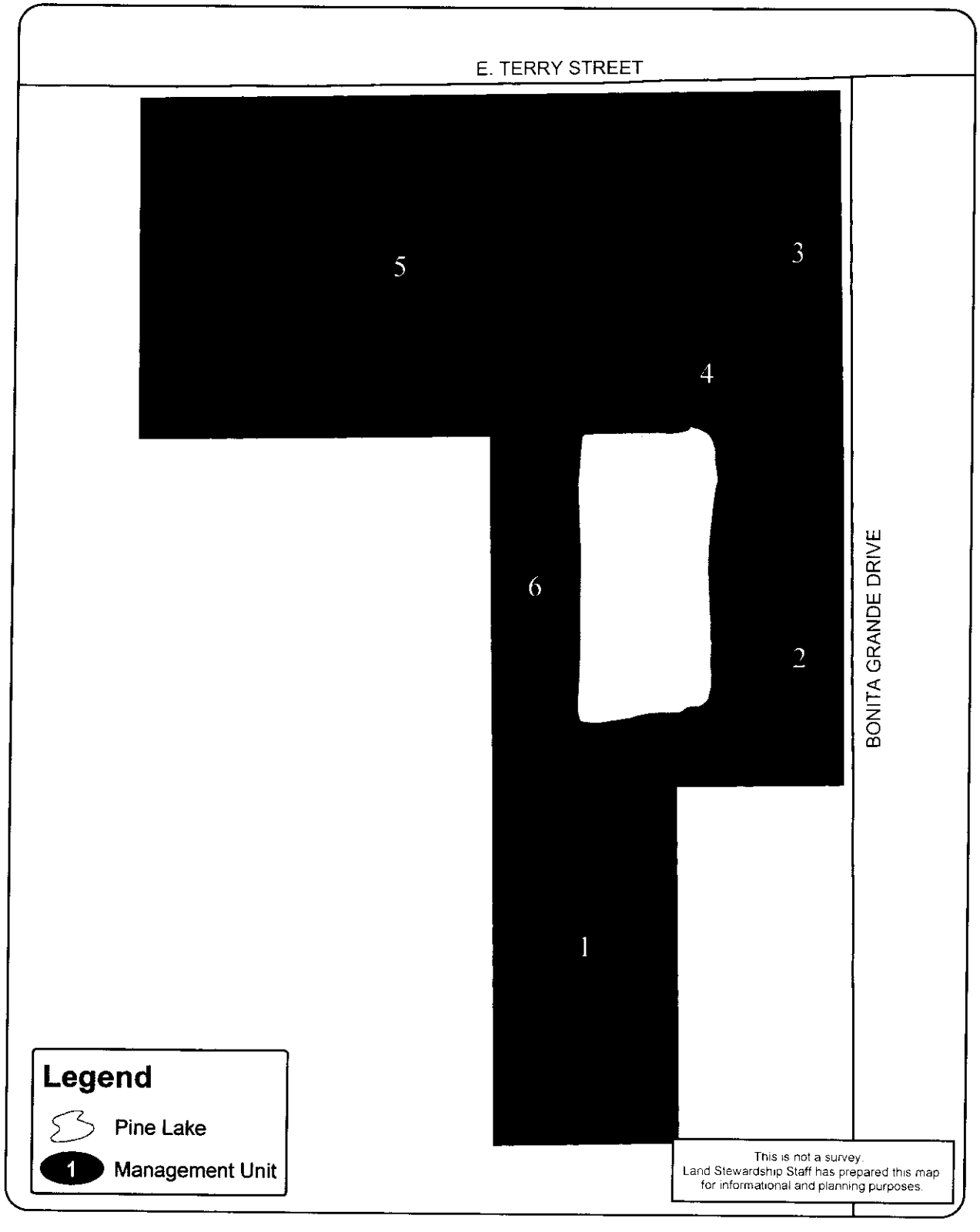
Management Unit 4 – 23 acres
This Unit is located in the center of the Preserve and includes the borrow pit and the surrounding disturbed areas. To the north of the borrow pit is a melaleuca monoculture. The area surrounding Pine Lake is scattered with Brazilian pepper, melaleuca and downy rose myrtle. Management activities will focus on exotic control, filling or plugging ditches and borrow pit improvements.

Management Unit 5 – 54 acres
This Unit is located in the western arm of the Preserve. The boundary to the north is E. Terry Street, the west Kent Road, the east an access road and the

south an improved farm road. The majority of this Unit is a floodplain swamp community dominated by slash pine. The northwest corner has a small area of scrubby flatwoods. A melaleuca monoculture is present in the southeast corner along the access road to the borrow pit. Exotic coverage is less than 25% throughout the rest of the Unit. A large number of exotics are present along the access road on the southern border. Species include Brazilian pepper, lead tree (*Leucaena leucocephala*) and ear-leaf acacia (*Acacia auriculiformis*). Management activities will focus on exotic control and the creation of a trail that loops to the borrow pit.

Management Unit 6 – 8.4 acres
This Management Unit is located to the west of Pine Lake. It is bordered to the west by unimproved pasture, the east by the borrow pit, Unit 5 to the north and Unit 1 to the south. This area is dominated by mesic flatwoods with less than 25% exotic coverage. Management activities will focus on exotic control and reintroduction of a prescribed fire regime.

Figure 17: Management Unit Map



B. Goals and Strategies

The primary management objectives for Pine Lake Preserve will be to restore a more natural hydrologic regime by increasing water flow onto the Preserve, slowing drainage within the boundaries of the Preserve and improving the Pine Lake and Kehl Canal to provide increased habitat for wildlife by December 31st 2009.

Additional activities at Pine Lake Preserve will focus on the following:

1. Fencing and Signage
2. Feral Animal Removal
3. Control of Invasive Exotic Plants
4. Public Access and Resource Based Recreation
5. Prescribed Fire

These activities are prioritized according to their importance and ease of accomplishment and will take place concurrently with the primary management objective. We do not have funding for all of the following long term goals, so grants and/or monies budgeted for mitigation of any governmental infrastructure projects in Lee County will be used to supplement our operations budget to meet our goals in a timely manner.

Restoring Hydrologic Regime

Restoring the Preserve's hydrologic regime will be difficult due to surrounding influences. The principle hydrologic restoration projects include filling and/or plugging several internal ditches, improving Kehl Canal to slow water flow, enhancing littoral zones around Pine Lake and redirecting some of the sheetflow from the CREW lands to the east to flow under Bonita Grande Drive and onto PLP.

Ditch 1, which runs from the northern access gate to the borrow pit, will be completely filled in using on-site material that does not contain vegetation (Figure 18). There is some vegetation on the berm that will be cleared, piled and burned in Unit 4. Spoil material from the creation of the original ditch is still present and will be used to fill the ditch once vegetation is removed. If any extra fill is needed, it will come from the borrow pit area where the shallow littoral zone will be created. Figure 18 shows the possible location of 2 plugs to be placed in Ditch 2. These two locations are conceptual and research will need to be conducted to determine the best location. This will slow the water flow to the borrow pit and Kehl Canal in hopes of re-hydrating the northeast corner of the Preserve. Vegetation on the berm may need to be removed prior to installing the plugs. All fill material will come from the existing berm resulting from the original creation of the ditch.

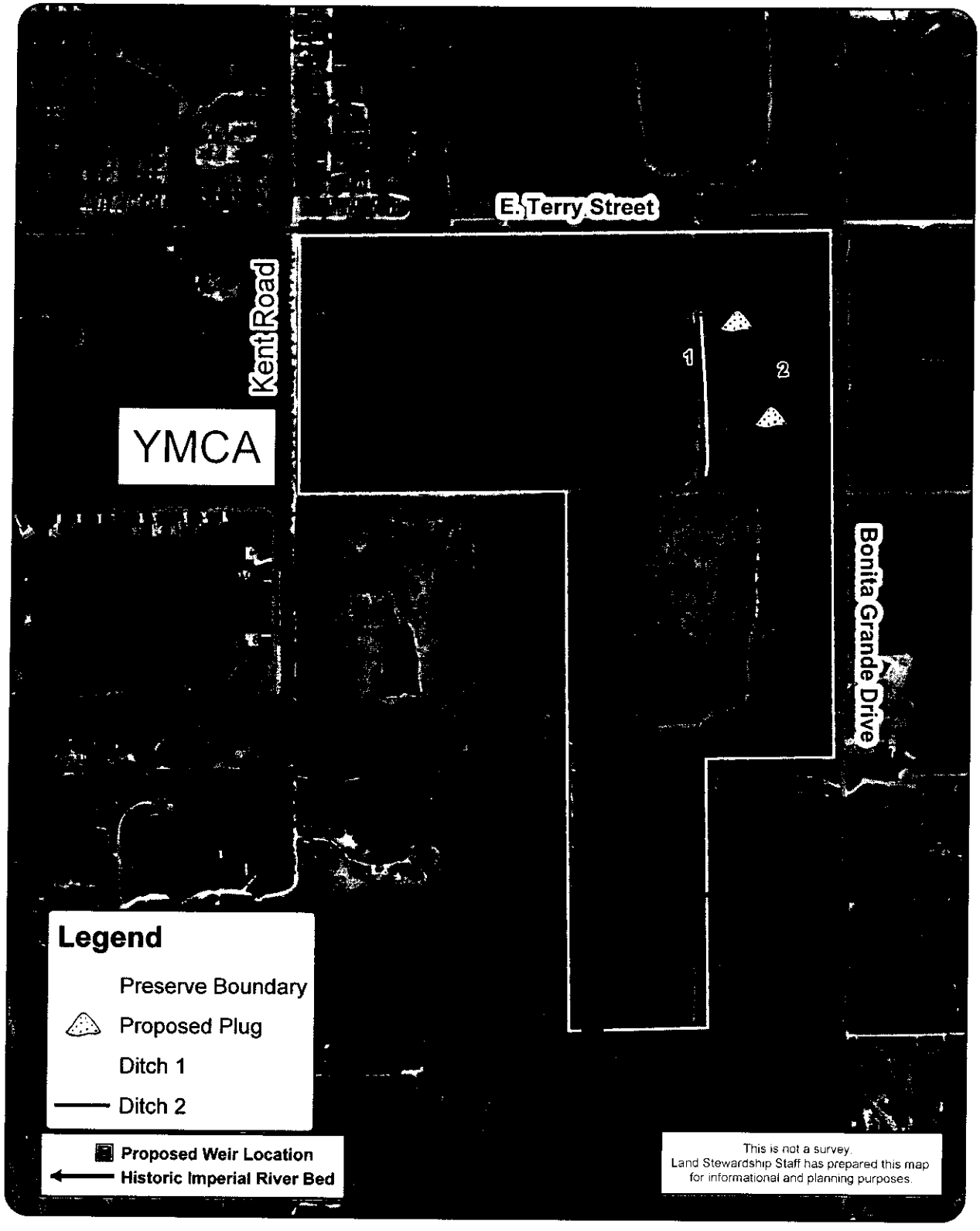
The second hydrologic restoration activity is to slow the water flow in the canal and allow water to flow through the historic Imperial River channel. Although berm cuts were made in 2004, there is still a 4-5 foot elevation difference between the bottom of the canal and the bottom of the river channel. Slowing the water will raise the levels high enough in the canal to allow water to flow through the river channel. RHT Engineering has developed plans for the Kehl Canal and surrounding floodplain for the proposed development directly south of PLP (Appendix E). This involves filling the existing canal and creating more of a meandering canal with marsh areas in the floodplains. The county will ensure that these plans meet objectives of this stewardship plan and any work on the Preserve will be coordinated to reach the same goals. Installing a weir on the Kehl Canal would also force water to flow backup and through the southern arm of the historic Imperial River channel. Staff is working with Lee County's Division of Natural Resources and the SFWMD to determine if this project is feasible.

Enhancements to the borrow pit will create shallow feeding and loafing areas for wading birds during the wet season. During the dry season, lake levels are low enough that there are islands in the middle of the lake that provide feeding and basking areas for wildlife. Potential improvements include regrading the banks of the borrow pit to create a littoral zone with shallower slope (at least 6:1) and a sinuous edge to create more habitat for wildlife during high water levels. RHT Engineering has also provided staff with a proposal for this project as part of their client's required floodplain compensation for their development (Appendix E). It may not be feasible or appropriate to collaborate with the adjacent development on this project. If not, staff will explore other avenues. Once this work is complete, native wetland plants will be planted around the lake for shade and cover for wildlife. There will be three different planting zones on the slope determined by the flooding tolerance of each species. Some areas will be created especially to create shade for wildlife viewing benches.

Finally, Land Stewardship staff will discuss with SFWMD the possibility of rehydrating the historic wetland areas on the northern portion of the Preserve by installing culverts under Bonita Grande Drive and possibly in conjunction with the construction of County Road 951. This would allow some of the sheetflow that currently flows along the east side of the road and into the Kehl Canal into the northeast corner of PLP. This area was a former cypress swamp that is slowly being invaded with south Florida slash pines.

Hydrologic improvements will begin in the winter of 2008 and be completed by the winter of 2009. All of these activities will require permitting from SFWMD. A restoration proposal will be presented to them for possible funding and assistance with the permitting process.

Figure 18: Hydrologic Restoration Plan



Fencing and Signage

The Preserve is completely fenced. Repairs need to be made to the fence on the southern border of the western arm. The barbed wire is hung, but posts need to be installed. Boundary signs will be posted every 300 feet along the border of the Preserve. After the cattle are removed, a sign will be posted on the access gate on E. Terry Street directing visitors to use a walk-through on Kent Road. The cattle pen near the southwest corner of the borrow pit will be removed. All improvements to fences will be completed by March 2006.

Feral Animal Removal

As soon as this stewardship plan has been approved, staff will work with Lee County Animal Services to set live traps to capture the free ranging dogs and cats that have been documented on PLP. Staff will look for domestic dog and cat tracks at each site inspection. If cat or dog tracks are found, staff will request that traps be installed until the animals have been captured.

Control of Invasive Exotic Plants

Invasive exotic plant control will be conducted throughout the entire Preserve. The goal is to remove and control these targeted plants, followed with semi-annual or as needed treatments of resprouts and new seedlings. This goal will be implemented by bringing each unit to a maintenance level, defined as less than 5% invasive exotic plant coverage. Before any exotic removal is done, land stewardship staff will conduct surveys to note locations of fox squirrel nests, bird nests, gopher tortoise burrows and alligator nests. This work will start in October 2005 and continue until completed. Annual follow-up herbicide work will be conducted until the plants are controlled.

A Statement of Work document, approved by the SFWMD, has been attached in Appendix F as an outline for exotic control. This document outlines the amount of exotic infestation, along with detailed work to be done in each management unit. The major target species are melaleuca, Brazilian pepper and downy rose myrtle. A combination of mechanical and hand control will be necessary. Hand crews will be used in areas with less than 25% infestation. This will consist of cutting exotic trees and shrubs, treating the stumps and pilling cut shrubs where necessary. Mechanical control will be used in areas that have greater than 25% infestation. Two different types of mechanical removal will be used: an excavator and a mulching machine. The excavator will be used in the melaleuca monocultures and areas that already have ground disturbance. The material will be piled and burned, mainly in Unit 4. Trees from other areas will be hauled, piled and burned in this open area. A mulching machine will be used in areas where ground cover is sensitive and more native plants are present. After the initial work, chemical treatment will be followed up 6 months to one year after

removal, depending on hydrologic conditions, to control any new root or seed sprouts.

Prior to each invasive exotic plant control project at PLP a Prescription Form (located in the LSOM) will be filled out by land stewardship staff, reviewed by the contractor(s) and signed by both parties. All contractors involved in these projects will be required to fill out the Daily Report Control Form (located in the LSOM).

Public Access and Resource Based Recreation

In accordance with the Land Stewardship Operations Manual, PLP will become a Category 2 Intermediate Use Preserve. The rancher will be notified of the exotic plant control project that will begin in September 2005 and the lease will be terminated. Once exotic control is complete, work will be done to improve public access and recreation. Figure 15 shows the Conceptual Master Site Plan for public access and recreation.

A verbal agreement with representatives from the Bonita Bay Group on behalf of the YMCA has been made to allow visitors to the Preserve to utilize their parking area as well as to provide information about the Preserve to their visitors. Before the Preserve is opened to the public, a written agreement between the YMCA and Lee County Parks and Recreation will be approved by the Lee County Board of County Commissioners (BoCC). An informational kiosk will be placed at the walk-thru entrance that includes a Preserve sign (minimum size of 2' x 3') that welcomes visitors to the Preserve, shows the shape of the Preserve, a trail map, identifies some of the plants and animals found on the Preserve, trail closures and the general rules of the Preserve. Access to the Preserve will be at a walk-through created on Kent Road across from the YMCA. A loop-trail will be created in the western arm of the Preserve that leads to the lake. It will be marked through the woods by staff and volunteers. Vegetation will be trimmed just enough to create a visible trail. The trail will be blazed with appropriate colors to guide visitors along the path. This trail may need to be closed if water levels are high. The southern border of the Preserve will also need to be cleared for a path along the Kehl Canal so visitors can make a loop around the southern arm. Once flow is restored to the Imperial River, the trail around the southern arm may need to be closed to prevent erosion on the riverbanks. The firebreak between Units 1 and 6 will be used as a loop trail back to the lake area. Other trails will follow the existing roads and firebreaks in the Preserve and will be minimally marked.

Once improvements to the borrow pit are made, a birding area will be created. Benches will be placed strategically around the lake for bird viewing (Figure 15). Land Stewardship staff will work with a local volunteer group, possibly boy scouts or Audubon groups, to install benches for bird viewing. Funding from C20/20 for this Preserve will be used to buy materials and volunteer and/or staff time will be

used to install them. Native plantings will surround these benches to create shade and cover for bird watching. Land Stewardship staff will determine if a contractor will be hired to assist with the plantings and their care for the initial months after planting and document any mortality. It is possible that Bird Patrol volunteers could help with the monitoring of these plantings. There will also be several educational signs about local plants and animals and restoration projects at the Preserve. The Preserve will be open for public use in December 2007 and bird watching benches and educational signs should be installed by March 2009.

Prescribed Fire

Prescribed fire will be another tool used to enhance wildlife habitat at the Preserve. A prescribed fire plan will be implemented at PLP to closely mimic the natural fire regimes for the different plant communities to increase plant diversity and insure the canopies remain open. Management Units 2 and 6 are the only units with fire dependent plant communities. Mesic flatwoods historically burned every 1-8 years. Here at PLP, a fire return interval of 4-6 years will be enough to control the vegetation and enhance wildlife foraging and habitat. There are no wildlife species present that require a more frequent fire return interval. After exotic control, these sites will be assessed for fuel loads before the initial burn. If the fuel loads are still too high to burn, some sites may be mowed to reduce fuel levels. Initially, cool, winter fires will need to be used to reduce fuel loads and stress on canopy trees. The best firing technique will be to use spot fires to create a mosaic effect. Once the fuel loads are reduced, growing season fires can be used. The return interval will need to be based on the amount of fuel present and the risk to the canopy trees. This fire plan will be implemented once exotic control is complete across the entire Preserve.

The following Prioritized Projected Timetable for Implementation is based on obtaining necessary funding for numerous land stewardship projects. Implementation of these goals may also be delayed due to changes in staff, extreme weather conditions or a change in priorities on properties managed by Lee County.

VII. PROJECTED TIMETABLE FOR IMPLEMENTATION

Prioritized Projected Timetable for Implementation of the Management Action Plan (Sept 2005 – Dec 2009)

Management Activity	Sep-05	Dec-05	Mar-06	Jun-06	Sep-06	Dec-06	Mar-07	Jun-07	Sep-07	Dec-07	Mar-08	Jun-08	Sep-08	Dec-08	Mar-09	Jun-09	Sep-09	Dec-09
Natural Resource Management																		
Restoration Activities																		
Initial exotic plant control	X																	
Hydrologic Restoration - Fill Ditch 1														X				
Hydrologic Restoration - Plug Ditch 2														X				
Improvements to borrow pit															X			
Supplemental Plantings																X		
Fire																		
Mechanical brush reduction					X													
Implementation of Rx FMP						X												
Maintenance (On-going/Annual)																		
Follow up exotic plant control				X														
Exotic animal removal	X																	
Outside Consultants																		
Environmental Consultant							X											
Permitting - SFWMD								X										
Overall Protection																		
Improvements on fencing & gates			X															
Boundary sign installation	X																	
Feral Animal Removal	X																	
Cattle removal	X																	
Remove Cattle Pen			X															
Change Zoning or Land Use categories																		
Public Use																		
Creation of Public Access										X								
Create trails									X									
Birding area															X			
Educational sign installation															X			

VIII. FINANCIAL CONSIDERATIONS

There is a management fund established in perpetuity for all Conservation 20/20 preserves. Monies from this fund will be available for all aspects of restoration projects and management in perpetuity, at Pine Lake. Monies will be supplemented through pursuing appropriate grants or other sources of funding, such as but not limited to South Florida Water Management District and USFWS Partners for Wildlife Program. SFWMD has already granted the County $125,000 for exotic plant removal at Pine Lake Preserve. The grant states that this work will begin in October 2005. We will also potentially look to the City of Bonita Springs as either a source of additional funding or a group to co-apply for future grants. Projected costs and funding sources are listed in Appendix G.

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X. APPENDICES

Appendix A: Plant Sightings

Appendix B: Wildlife Sightings

Appendix C: Crisafulli/South Florida Water Management District Agreement

Appendix D: Projected C.R. 951 Extension

Appendix E: Proposed Improvements to Kehl Canal and Borrow Pit

Appendix F: Statement of Work for Exotic Removal

Appendix G: Projected Costs and Funding Sources

Appendix A: Plant Sightings at Pine Lake Preserve

Appendix A: Plant Sightings at Pine Lake Preserve

Common and Scientific names for this list were obtained from Wunderlin & Hansen, 2003

Scientific Name	Common Name	Native/Exotic
Family: Blechnaceae (midsorus fern)		
Blechnum serrulatum	swamp fern	native
Family: Dennstaedtiaceae (cuplet fern)		
Pteridium aquilinum var.?	bracken fern	native
Family: Dryopteridaceae (wood fern)		
Nephrolepis cordifolia	tuberous sword fern	native
Family: Polypodiaceae (polypody)		
Phlebodium aureum	golden polypody	native
Family: Cupressaceae (cedar)		
Taxodium ascendens	pond cypress	native
Taxodium distichum	bald cypress	native
Family: Pinacea (Pine)		
Pinus elliottii	slash pine	native
Family: Arecaceae (palm)		
Sabal palmetto	cabbage palm	native
Serenoa repens	saw palmetto	native
Family: Bromeliaceae (pineapple)		
Tillandsia fasciculata	cardinal airplant	native
Tillandsia recurvata	ballmoss	native
Tillandsia usneoides	Spanish moss	native
Family: Commelinaceae (spiderwort)		
Tradescantia zebrina	wandering-jew	exotic
Family: Hypoxidaceae (yellow stargrass)		
Hypoxis juncea	fringed yellow stargrass	native
Family: Orchidaceae (orchid)		
Encyclia tampensis	butterfly orchid	native
Family: Poaceae (grass)		
Cenchrus spinifex	coastal sandbur	native
Setaria parviflora	yellow bristlegrass	native
Family: Smilaceae (smilax)		
Smilax auriculata	earleaf greenbrier	native
Smilax bona-nox	saw greenbrier	native
Smilax laurifolia	laurel greenbrier	native
Family: Xyridaceae (yelloweyed grass)		
Xyris spp.	yellow-eyed grass	native
Family: Anacardiaceae (cashew)		
Rhus copallinum	winged sumac	native
Schinus terebinthifolius	Brazilian pepper	exotic
Toxicodendron radicans	eastern poison ivy	native
Family: Annonaceae (custard-apple)		
Annona glabra	pond apple	native
Family: Aquifoliaceae (holly)		
Ilex cassine var. *cassine*	dahoon	native
Ilex glabra	gallberry	native
Family: Asteraceae (aster)		
Coreopsis leavenworthii	leavenworth's tickseed	native
Pluchea rosea	rosy camphorweed	native

Appendix A: Plant Sightings at Pine Lake Preserve (continued)

Scientific Name	Common Name	Native/Exotic
Family: Asteraceae (aster)		
Pterocaulon pycnostachyum	blackroot	native
Mikania scandens	climbing hempvine	native
Family: Boraginaceae (borage)		
Heliotropium polyphyllum	pineland heliotrope	native
Family: Cactaceae (cactus)		
Opuntia spp.	prickly-pear cactus	native
Family: Casuarinaceae (sheoak)		
Casuarina equisetifolia	Australian-pine	exotic
Family: Chrysobalanaceae (coco plum)		
Chrysobalanus icaco	coco plum	native
Licania michauxii	gopher apple	native
Family: Convolvulaceae (morning-glory)		
Ipomoea sagittata	saltmarsh morning-glory	native
Family: Cucurbitaceae (gourd)		
Momordica charantia	balsam pear	exotic
Family: Ericaceae (heath)		
Lyonia lucida	fetterbush	native
Vaccinium myrsinites	shiny blueberry	native
Family: Fabaceae (pea)		
Abrus precatorius	rosary pea	exotic
Acacia auriculiformis	earleaf acacia	exotic
Senna alata	candlestick plant	exotic
Senna obtusifolia	coffeeweed	exotic
Leucaena leucocephala	lead tree	exotic
Family: Fagaceae (beech)		
Quercus virginiana	live oak	native
Quercus laurifolia	laurel oak	native
Family: Juglandaceae (walnut)		
Carya aquatica	water hickory	native
Family: Lamiaceae (mint)		
Piloblephis rigida	pennyroyal	native
Family: Lauraceae (laurel)		
Persea palustris	swamp bay	native
Family: Malvaceae (mallow)		
Melochia corchorifolia	chocolateweed	exotic
Urena lobata	Caesarweed	exotic
Family: Moraceae (mulberry)		
Ficus aurea	strangler fig	native
Family: Myricaceae (bayberry)		
Myrica cerifera	wax myrtle	native
Family: Myrsinaceae (myrsine)		
Rapanea punctata	myrsine	native
Family: Myrtaceae (myrtle)		
Melaleuca quinquenervia	punktree	exotic
Rhodomyrtus tomentosa	downy rose myrtle	exotic
Syzygium cumini	Java plum	exotic

Appendix A: Plant Sightings at Pine Lake Preserve (continued)

Scientific Name	Common Name	Native/Exotic
Family: Olacaceae (olax)		
Ximenia americana	hog plum	native
Family: Onagraceae (eveningprimrose)		
Ludwigia maritima	seaside primrosewillow	native
Family: Phytolaccaceae (pokeweed)		
Phytolacca americana	American pokeweed	native
Family: Poaceae		
Aristida stricta	wiregrass	native
Family: Rubiaceae (madder)		
Cephalanthus occidentalis	common buttonbush	native
Chiococca alba	snowberry	native
Spermacoce verticillata	whitehead broom	exotic
Family: Sapotaceae (sapodilla)		
Sideroxylon celastrinum	saffron plum	native
Sideroxylon reclinatum	Florida bully	native
Family: Sterculiaceae		
Melochia corchorifolia	chocolate weed	exotic
Family: Verbenaceae (vervain)		
Callicarpa americana	American beautyberry	native
Phyla nodiflora	turkey tangle fogfruit	native
Family: Vitaceae (grape)		
Vitis rotundifolia	muscadine	native

Appendix B: Wildlife sightings at Pine Lake Preserve

Appendix B: Wildlife Sightings at Pine Lake Preserve

Scientific Name	Common name	Designated Status FWC	FWS
REPTILES			
Family: Alligatoridae (alligator and caiman)			
Alligator mississippiensis	American alligator	SSC	T S/A
Family: Emydidae (box and water turtles)			
Pseudemys floridana peninsularis	peninsula cooter		
Family: Testudinidae (gopher tortoises)			
Gopherus polyphemus	gopher tortoise	SSC	
Family: Polychridae (anoles)			
Anolis carolinensis	green anole		
Anolis sagrei	brown anole		
AMPHIBIANS			
Family: Bufonidae (toads)			
Bufo terrestris	southern toad		
Bufo quercicus	oak toad		
Family: Hylidae (treefrogs and their allies)			
Hyla squirella	squirrel treefrog		
Family: Microhylidae (narrowmouth toads)			
Gastrophryne carolinensis	eastern narrowmouthed toad		
MAMMALS			
Family: Canidae (coyotes and foxes)			
Urocyon cinereoargenteus	common gray fox		
Family: Sciuridae (squirrels)			
Sciurus carolinensis	eastern gray squirrel		
Sciurus niger avicennia	Big Cypress fox squirrel	T	
BIRDS			
Family: Phalacrocoracidae (cormorants)			
Phalacrocorax auritus	double-crested cormorant		
Family: Anhingidae (anhingas)			
Anhinga anhinga	anhinga		
Family: Ardenidae (herons, egrets, bitterns)			
Ardea herodius	great blue heron		
Egretta caerulea	little blue heron	SSC	
Egretta tricolor	tricolored heron	SSC	
Ardea alba	great egret		
Egretta thula	snowy egret	SSC	
Bubulcus ibis	cattle egret		
Family: Threskiornithidae (ibises and spoonbills)			
Plegadis falcinellus	glossy ibis		
Eudocimus albus	white ibis	SSC	
Family: Ciconiidae (storks)			
Mycteria americana	wood stork		E
Family: Anatidae (swans, geese, ducks)			
Subfamily: Anatinae (dabbling ducks)			
Anas fulvigula	mottled duck		

Appendix B: Wildlife Sightings at Pine Lake Preserve (continued)

Scientific Name	Common name	Designated Status	
		FWC	FWS
Family: Cathartidae (new world vultures)			
Cathartes aura	turkey vulture		
Coragyps atratus	black vulture		
Family: Accipitridae (hawks, kites, accipiters, harriers and eagles)			
Subfamily: Buteoninae (buzzard hawks)			
Buteo lineatus	red-shouldered hawk		
Subfamily: Buteoninae (eagles)			
Hailaeetus leucocephalus	bald eagle	T	T
Subfamily: Elaninae and Milvinae (kites)			
Elanoides forficatus	swallow-tailed kite		
Family: Pandionidae (ospreys)			
Pandion haliaetus	osprey		
Family: Rallidae (coots, gallinules)			
Gallinula chloropus	common moorhen		
Family: Charadriidae (plovers)			
Charadrius vociferus	killdeer		
Family: Scolopacidae (sandpipers)			
Limnodromus griseus	short-billed dowitcher		
Family: Recurvirostridae (avocets and stilts)			
Himantopus mexicanus	black-necked stilt		
Family: Scolopacidae (sandpipers, phalaropes)			
Tringa melanoleuca	greater yellowlegs		
Calidris minutilla	least sandpiper		
Calidris mauri	western sandpiper		
Family: Columbidae (pigeons and doves)			
Zenaida macroura	mourning dove		
Family: Strigidae (owls)			
Strix varia	barred owl		
Family: Alcedinidae (kingfishers)			
Ceryle alcyon	belted kingfisher		
Family: Picidae (woodpeckers)			
Dryocopus pileatus	pileated woodpecker		
Melanerpes carolinus	red-bellied woodpecker		
Picoides pubescens	downy woodpecker		
Family: Tyrannidae (tyrant flycatchers)			
Sayornis phoebe	eastern phoebe		
Family: Hirundinidae (swallows)			
Tachycineta bicolor	tree swallow		
Family: Troglodytidae (wrens)			
Thryothorus ludovicianus	Carolina wren		
Family: Regulidae (kinglets)			
Subfamily: Polioptiltnae (gnatcatchers)			
Polioptila caerulea	blue-gray gnatcatcher		
Family: Turdidae (thrushes)			
Turdus migratorius	American robin		
Family: Mimidae (mockingbirds and thrashers)			
Dumetella carolinensis	gray catbird		

Appendix B: Wildlife Sightings at Pine Lake Preserve (continued)

Scientific Name	Common name	Designated Status	
		FWC	FWS
Family: Mimidae (mockingbirds and thrashers)			
Mimus polyglottos	northern mockingbird		
Family: Corvidae (crows, jays, etc.)			
Cyanocitta cristata	blue jay		
Family: Bombycillidae (waxwings)			
Bombycilla cedrorum	cedar waxwing		
Family: Parulidae (wood-warblers)			
Dendroica dominica	yellow-throated warbler		
Dendroica coronata	yellow-rumped warbler		
Dendroica pinus	pine warbler		
Dendroica discolor	prairie warbler		
Dendroica palmarum	palm warbler		
Family: Fringillidae, Emberizidae, Cardinalidae (grosbeaks, finches, sparrows, buntings)			
Cardinalis cardinalis	northern cardinal		
BUTTERFILES			
Family: Nymphlidae (longwing)			
Subfamily: Heliconiinae			
Agraulis vanillae nigrior	gulf fritillary		
Heliconius charitonius tuckeri	zebra longwing		

KEY

FWC= Florida Fish & Wildlife Conservation Commission
FWS= U.S. Fish & Wildlife Service

E= Endangered
T= Threatened
SSC= Species of Special Concern

Appendix C: Crisafulli/South Florida Water Management District Agreement

3045

Rec. $15.00

INSTR # 5026876
OR BK 03341 PG 0453
RECORDED 12/15/00 03:22 PM
CHARLIE GREEN CLERK OF COURT
LEE COUNTY
RECORDING FEE 15.00
DEPUTY CLERK C Keller

EXHIBIT "A"

LAN 06-08

Return to:
SOUTH FLORIDA WATER MANAGEMENT DISTRICT
Attn: Jacque Rippe
2301 McGregor Boulevard
Fort Myers, FL 33901

This instrument prepared by:
Holly Y. Walter Esq.
South Florida Water Management District
3301 Gun Club Road, P. O. Box 24680
West Palm Beach, FL 33416-4680

Project: No-Rails Bridge
Folio No.: 31-47-26-B2-00609.0010

RELEASE

FOR GOOD AND VALUABLE CONSIDERATION, the receipt and sufficiency of which is hereby ACKNOWLEDGED, I/WE, A.S. & Dorothy Crisafulli whose mailing address is 11217 Dean Street, Bonita Springs, Florida 34135 (hereinafter "Owner"), does/do hereby release the **SOUTH FLORIDA WATER MANAGEMENT DISTRICT**, a public corporation of the State of Florida, with its principal office at 3301 Gun Club road, West Palm Beach, Florida 33406, and whose mailing address is Post Office Box 24680, West Palm Beach, Florida 33416-4680, Palm Beach County (hereinafter, "SFWMD") its successors and assigns, as follows:

1) Owner understands that SFWMD desires to remove that certain bridge known as the No-Rails Bridge (the "Bridge") located on Orr Road/Kent Road at the headwaters of the Imperial River in connection with the improvement of the stormwater drainage over property located east of I-75 and north of Bonita Beach Road in Lee County, Florida.

2) Owner understands that Owner's access to the Lee County road network south of the Bridge will be adversely impacted by the removal of the Bridge.

3) Owner understands that pursuant to that certain Agreement, dated November 21, 2000, by and between Owner and SFWMD, Owner hereby releases any and all rights that it may have to use the Bridge for the purpose of accessing the County road network south of the Bridge in exchange for, and as a condition of, the removal of the Bridge, reconstruction of Kent Road/Orr Road from East Terry South, paving improvements, construction of a drainage swale alongside said road continuing south of said roadway for the purpose of carrying stormwater runoff to the Imperial River (the "Project").

4) Owner hereby releases SFWMD, its successors and assigns, from any claim, loss, damage, demand, cost including attorney's fees, expense, cause of action, or judgment which Owner now

has or may hereafter have in perpetuity with regard to impacts of the Project on any person or property, including without limitation that certain real property legally described in Exhibit "A" attached hereto and incorporated herein by reference.

5) Owner acknowledges and agrees that neither SFWMD nor its agents shall be responsible for the maintenance of the drainage swale from East Terry Street to the Imperial River nor the paved improvements to Kent Road after the Project is completed.

6) This instrument runs with the land and is binding on and inures to the benefit of the parties hereto, and their heirs, successors, and assigns.

Signed, sealed and delivered on this 21st day of November, 2000.

In the presence of:

WITNESS:

Signature: A P DeSalvo
Printed Name: A P DeSalvo

Signature: John D Spear
Printed Name: John D. Spear

Signature: A P DeSalvo
Printed Name: A P DeSalvo

Signature: John D Spear
Printed Name: John D. Spear

OWNER:

Signature: A.S. Crisafulli
A.S. Crisafulli

Signature: Dorothy Crisafulli
Dorothy Crisafulli

STATE OF Florida
COUNTY OF Lee

The foregoing instrument was acknowledged before me this 21st day of November, 2000, by A.S. Crisafulli, whom is/~~are~~ personally known to me or whom has/~~have~~ produced _____ as identification and ~~who did not take and oath.~~

John D Spear
Notary Public, State of Florida
Print Name: John D. Spear
My Commission Expires:

JOHN D SPEAR
NOTARY PUBLIC STATE OF FLORIDA
COMMISSION NO. CC906958
MY COMMISSION EXP. FEB. 25 2003

STATE OF Florida
COUNTY OF Lee

The foregoing instrument was acknowledged before me this 21st day of November, 2000, by Dorothy Crisafulli, whom is/are personally known to me or whom has/have produced _____ as identification ~~and who did not take and oath.~~

John D Spear
Notary Public, State of Florida
Print Name: John D. Spear
My Commission Expires:

JOHN D SPEAR
NOTARY PUBLIC STATE OF FLORIDA
COMMISSION NO. CC906958

EXHIBIT "A"

OR BK 03341 PG 0455

he Westerly 48 feet of the North half of the Northeast quarter of Section 31, Township 47 South, Range 26 East, Lee County, Florida.

A.S. Crisafulli
Dorothy Crisafulli

INSTR # 5026877
OR BK 03341 PG 0456
RECORDED 12/19/00 03:22 PM
CHARLIE GREEN CLERK OF COURT
LEE COUNTY
RECORDING FEE 19.50
DOC TAX PD(F.S.201.02) 0.70
DEPUTY CLERK E Keller

Rec. $19.50
D/S $ .70

EXHIBIT "B"

LAN 06-08

Return to:
SOUTH FLORIDA WATER MANAGEMENT DISTRICT
Attn: Jacque Rippe
2301 McGregor Boulevard
Fort Myers, FL 33901

This instrument prepared by:
Holly Y. Walter, Esquire
South Florida Water Management District
3301 Gun Club Road, P. O. Box 24680
West Palm Beach, FL 33416-4680

Project: No-Rails Bridge
Folio No.: 31-47-26-B2-00609.0010

PERPETUAL ACCESS EASEMENT AGREEMENT

THIS PERPETUAL ACCESS EASEMENT AGREEMENT ("Easement") is made this 21st day of November, 2000, by A.S. & Dorothy Crisafulli, their successors and assigns (hereinafter referred to as the "Grantor"), in favor of Northern Property Owners Schedule I, whose mailing address is See Schedule I, their successors and assigns (hereinafter referred to as the "Grantee").

WITNESSETH:

For other good and valuable consideration, the adequacy and receipt of which are hereby acknowledged, Grantor hereby grants, bargains and conveys to the Grantee, a non-exclusive perpetual easement over, across, and upon that certain real property located in Lee County, Florida, legally described in Exhibit "A" attached hereto and made a part hereof (hereinafter referred to as the "Easement Parcel"), for the purpose of providing pedestrian and vehicular ingress and egress, to and from Bonita Beach Road, on, over and across that certain access road located in the Easement Parcel to and from that certain real property owned by Grantee, legally described in Exhibit "B" attached hereto.

TO HAVE AND the same together with all and singular the appurtenances thereunto belonging or in anywise incident or appertaining to the use, benefit and behoove of the Grantee forever.

The easements and the rights herein granted, or any portion thereof, shall not be assigned by the Grantee without the prior written consent of Grantor, which consent shall not be unreasonably withheld.

The easements, rights and privileges set forth herein shall be for the benefit of Grantee, his personal representative, heirs and/or assigns, his family and invitees.

Nothing contained in this Easement shall be construed to grant to Grantee, his personal representative, heirs and/or assigns, his family, invitees, or the public access to or the right to use any lands owned by Grantor other than the Easement Parcel.

The interest in the Easement Parcel is conveyed "AS IS". Grantee shall not have the right to improve or alter the Easement Parcel without the prior written approval of Grantor. However, Grantee, at its sole cost and expense, shall immediately repair any damage to the Easement Parcel arising from or caused by Grantee, his family or invitees' use of the Easement Parcel.

Grantee hereby indemnifies and holds harmless Grantor from and against any and all claims, suits, judgments, losses, damages, and liability which may be incurred by Grantee, Grantee's family and/or invitees, including but not limited to reasonable attorney's fees and costs, which arise directly, indirectly or proximately as a result of the exercise by Grantee, his family or invitees of their rights under this Easement.

The Easement Parcel shall, at no time be obstructed by fences, gates, traffic signals, guard railing, road signs, landscaping or any other object which would impede the Grantee's ingress or egress over, across and upon said property, or in any manner interfere with the purpose of this easement.

All of the covenants, agreements, easements and rights herein contained shall extend to, benefit and be binding upon the parties hereto and their respective successors and assigns.

The easements granted herein shall run with the land and shall burden the Easement Parcel.

IN WITNESS WHEREOF, this Easement Agreement has been executed by Grantor and Grantee whose hands and seals are affixed hereto as of the date first above written.

Signed, sealed and delivered in the presence of:

WITNESS:

Signature: A P DeSalvo
Printed Name: A P DeSalvo

Signature: John O Shea
Printed Name: John D. Spear

Signature: A P DeSalvo
Printed Name: A P DeSalvo

Signature: John O Shea
Printed Name: John D. Spear

GRANTOR:

Signature: A.S. Crisafulli
A.S. Crisafulli

Signature: Dorothy Crisafulli
Dorothy Crisafulli

STATE OF Florida
COUNTY OF Lee

The foregoing instrument was acknowledged before me this 21st day of Nov., 2000 by A.S. Crisafulli, who is personally known to me or has produced _____ as identification ~~and did not take an oath.~~

John D Spear
Notary Public, State of Florida
Print Name: John D. Spear
My Commission Expires: _____

OFFICIAL NOTARY SEAL
JOHN D SPEAR
NOTARY PUBLIC STATE OF FLORIDA
COMMISSION NO. CC806998
MY COMMISSION EXP. FEB. 25,2003

STATE OF Florida
COUNTY OF Lee

The foregoing instrument was acknowledged before me this 21st day of Nov. 2000 by Dorothy Crisafulli, who is personally known to me or has produced _____ as identification ~~and did not take an oath.~~

John D Spear
Notary Public, State of Florida
Print Name: John D. Spear
My Commission Expires: _____

OFFICIAL NOTARY SEAL
JOHN D SPEAR
NOTARY PUBLIC STATE OF FLORIDA
COMMISSION NO. CC806998
MY COMMISSION EXP. FEB. 25,2003

EXHIBIT "A"

OR Bk 03341 PG 0459

The Westerly 48 feet of the North half of the Northeast quarter of Section 31, Township 47 South, Range 26 East, Lee County, Florida.

A.S. Crisafulli
Dorothy Crisafulli

Rec. $19.50
D/S $ .70

INSTR # 5026878
OR BK 03341 PG 0460
RECORDED 12/19/00 03:22 PM
CHARLIE GREEN CLERK OF COURT
LEE COUNTY
RECORDING FEE 19.50
DOC TAX PD(F.S.201.02) 0.70
DEPUTY CLERK C Keller

EXHIBIT "C"

LAN 06 – 08

Return to:
SOUTH FLORIDA WATER MANAGEMENT DISTRICT
Attn: Jacque Rippe
2301 McGregor Boulevard
Fort Myers, FL 33901

This instrument prepared by:
Holly Y. Walter, Esquire,
South Florida Water Management District
3301 Gun Club Road, P. O. Box 24680
West Palm Beach, FL 33416-4680

Project: No-Rails Bridge
Folio No.: 31-47-26-B2-00609.0010

TEMPORARY CONSTRUCTION AND ACCESS EASEMENT

THIS INDENTURE made this 21st day of November, 2000, between A.S. Crisafulli & Dorothy Crisafulli whose mailing address is 11217 Dean Street, Bonita Springs, Florida 34135, hereinafter referred to as Grantor, and **SOUTH FLORIDA WATER MANAGEMENT DISTRICT**, a public corporation of the State of Florida, with its principal office at 3301 Gun Club Road, West Palm Beach, Florida 33406, and whose mailing address is Post Office Box 24680, West Palm Beach, Florida 33416-4680, Palm Beach County, hereinafter referred to as Grantee.

WITNESSETH:

For and in consideration of good and valuable consideration, the adequacy and receipt of which is hereby acknowledge, the Grantor hereby grants to the Grantee, its successors and assigns, a Temporary Construction Easement, for the purposes as set forth below, over the following described lands, situate in Lee County, Florida, legally described as follows (the "Easement Parcel"):

See Exhibit "A" attached hereto and made a part hereof

for any and all purposes necessary, convenient, incident to, or in connection with, the construction of any project in the interest of flood control, reclamation, conservation, recreation, water storage and allied purposes now or that may hereafter be conducted by the Grantee herein, or its successors or assigns, including, but not limited to, storing and removing dredged or excavated material, constructing and using detour and access roads, installing culverts and power facilities, constructing and using by-pass channels and return water ditches, laying, operating and using dredge pipe lines, and storing equipment materials, vehicles and supplies in connection with the improvement of stormwater drainage over property located east of I-75 and north of Bonita Beach Road in Lee County or in carrying out the purpose and intent of the Statutes of the State of Florida

relating to the **SOUTH FLORIDA WATER MANAGEMENT DISTRICT**, presently existing or that may be enacted in the future pertaining thereto.

TO HAVE AND TO HOLD the same together with all and singular the appurtenances thereunto belonging or in anywise incident or appertaining to the use, benefit and behoof of the Grantee through and including April 1, 2001.

The easements and the rights herein granted, or any portion thereof, may be assigned by the Grantee for use in connection with any of the purposes above mentioned.

The Easement Parcel shall, at no time be obstructed by fences, gates, traffic signals, guard railing, road signs, landscaping or any other object which would impede the Grantee's ingress or egress over, across and upon said property, or in any manner interfere with the purpose of this easement.

All of the covenants, agreements, easements and rights herein contained shall extend to, benefit and be binding upon the parties hereto and their respective executors, administrators, personal representatives, heirs, successors and assigns.

Grantor acknowledges that, prior to the earlier of the expiration of this Easement, as set forth above, Grantee, at its sole cost and expense, shall restore the Easement Parcel to the condition in which it existed immediately prior to the commencement of Grantee's use of such property under this Easement.

Grantor shall keep current on the payment of taxes and not allow any lien on the Easement Parcel superior to the easements conveyed herein. In the event Grantor fails to extinguish or subordinate any such lien, the Grantee may elect to pay off the lien on behalf of Grantor and Grantor shall reimburse Grantee for the amount of the pay off, together with reasonable attorney's fees and costs and interest at the maximum allowable rate, no later than thirty (30) days after delivery of notice of such payment. In the event Grantor does not reimburse Grantee, the debt owed to Grantee shall constitute a lien against the Easement Parcel which shall automatically relate back to the recordation date of this Easement and Grantee may foreclose on the Easement Parcel in the manner of mortgages on real property.

The easements granted herein shall constitute easements running with the land and shall burden the Easement Parcel. Grantor hereby warrants, represents and covenants that it is lawfully seized of the Easement Parcel in fee simple; that it has good right and lawful authority to grant the easements herein granted; that it hereby fully warrants the title to the easements herein granted and will defend the same against the lawful claims of all persons whomsoever; and that the Easement Parcel are free of all encumbrances.

IN WITNESS WHEREOF, the Grantor herein has caused these presents to be executed in its name on the day and year first above written.

Signed, sealed and delivered
in the presence of:

WITNESS:

Signature: A P DeSalvo
Printed Name: A P DeSalvo

Signature: John D Spear
Printed Name: John D Spear

Signature: A P DeSalvo
Printed Name: A P DeSalvo

Signature: John D Spear
Printed Name: John D Spear

OWNER:

Signature: A.S. Crisafulli
A.S. Crisafulli

Signature: Dorothy Crisafulli
Dorothy Crisafulli

STATE OF Florida
COUNTY OF Lee

The foregoing instrument was acknowledged before me this 21st day of November, 2000, by A.S. Crisafulli, whom is/~~are~~ personally known to me or whom has/~~have~~ produced _____ as identification ~~and who did not take and oath.~~

John D Spear
Notary Public, State of Florida
Print Name: John D. Spear
My Commission Expires:

OFFICIAL NOTARY SEAL
JOHN D SPEAR
NOTARY PUBLIC STATE OF FLORIDA
COMMISSION NO. CC806928
MY COMMISSION EXP. FEB. 25 2003

STATE OF Florida
COUNTY OF Lee

The foregoing instrument was acknowledged before me this 21st day of November, 2000, by Dorothy Crisafulli, whom is/~~are~~ personally known to me or whom has/~~have~~ produced _____ as identification ~~and who did not take and oath.~~

John D Spear
Notary Public, State of Florida
Print Name: John D. Spear
My Commission Expires:

OFFICIAL NOTARY SEAL
JOHN D SPEAR
NOTARY PUBLIC STATE OF FLORIDA
COMMISSION NO. CC806928
MY COMMISSION EXP. FEB. 25 2003

EXHIBIT "A"

OR Bk 03341 PG 0463

The Westerly 48 feet of the North half of the Northeast quarter of Section 31, Township 47 South, Range 26 East, Lee County, Florida.

A.S. Crisafulli
Dorothy Crisafulli

Appendix D: Projected C.R. 951 Extension

C.R. 951 Project Development & Environment Study

Project Alternatives - Concept Development

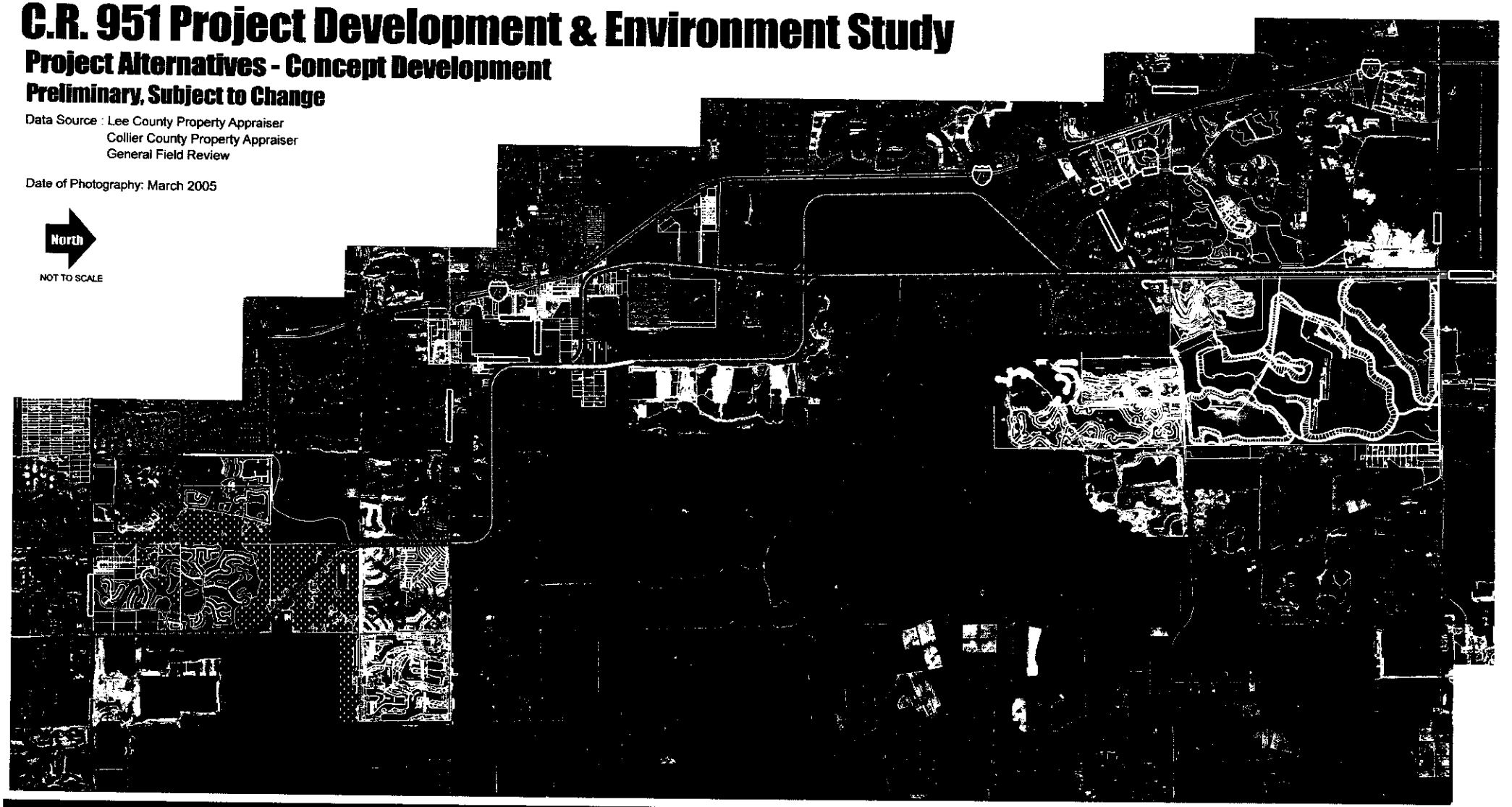
Preliminary, Subject to Change

Data Source : Lee County Property Appraiser
Collier County Property Appraiser
General Field Review

Date of Photography: March 2005

North

NOT TO SCALE

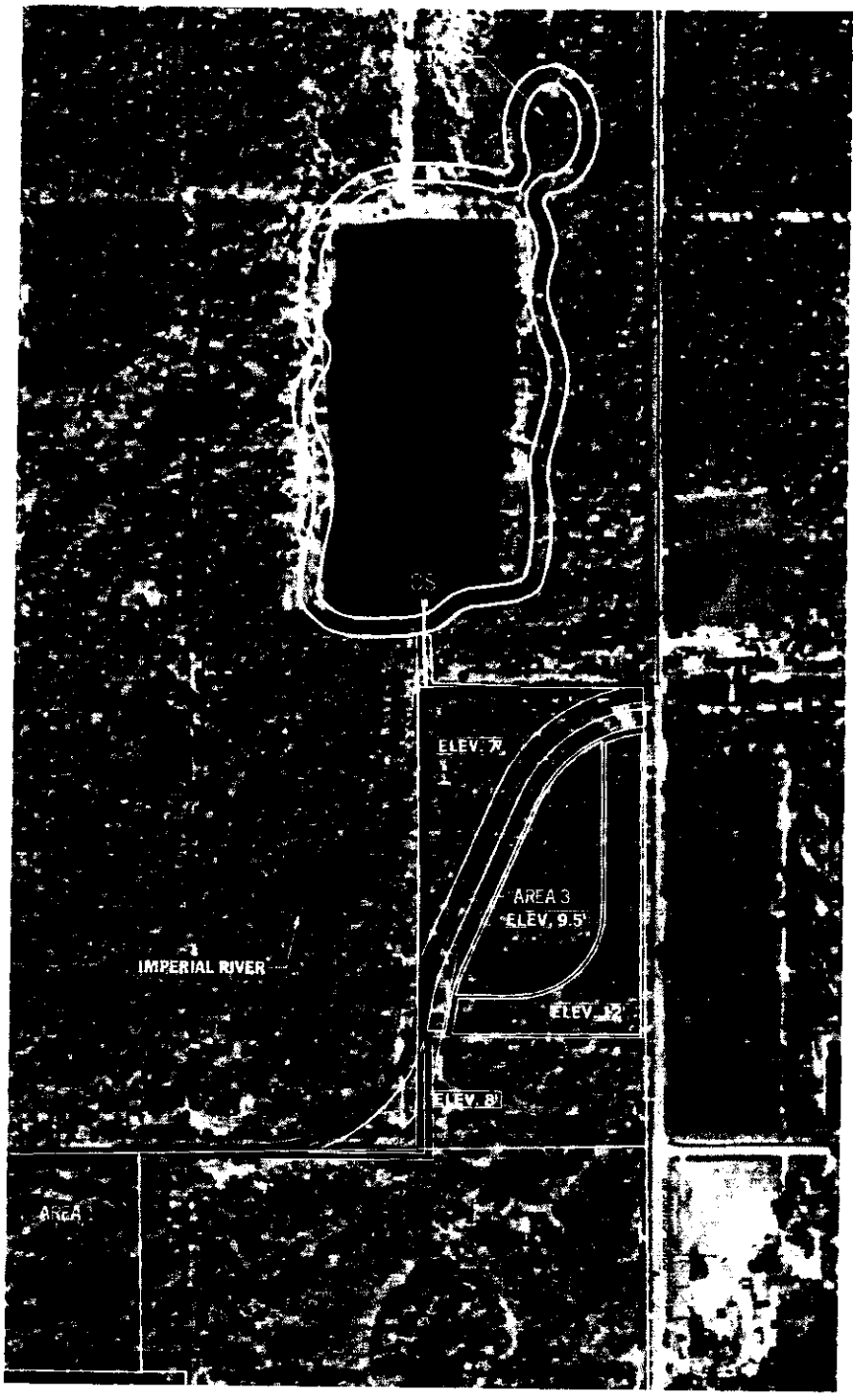


LEE COUNTY
SOUTHWEST FLORIDA

Collier County

DRMP

Appendix E: Proposed Improvements to Kehl Canal and Borrow Pit



N

SCALE: 1"=500'

AREAS SHOWN AT ELEV. 7' INTENDED TO MATCH BOTTOM ELEVATION OF IMPERIAL RIVER.

LAKE CONTROL STRUCTURE TO INCLUDE TIDE FLEX VALVE TO ALLOW WATER FROM KEHL CANAL INTO LAKE OVERFLOW TO CANAL AT 12'.

RHT engineering

Richard H. Thompson, P.E. # 46720
R.H.T. Engineering, Inc.
319 Inman Street
Lehigh Acres, FL 33972
(239) 369-8900
Engineering Certificate of Authorization # 25852

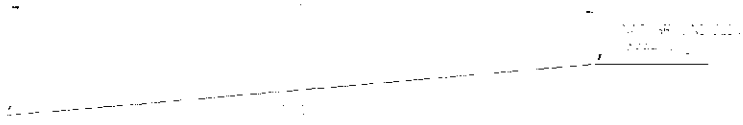
ROBERTS GROUP PROPERTY

CONCEPTUAL PLAN VIEW

Client:
Q. GRADY MINOR, P.A.

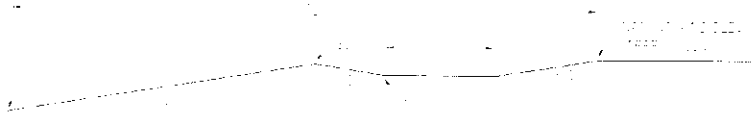
S31 / T47S / R16E
LEE COUNTY

EXHIBIT A

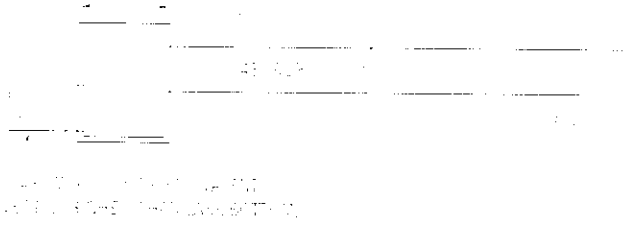


PROPOSED LAKE CROSS - SECTION 1

PROPOSED LAKE CROSS - SECTION 2



PROPOSED LAKE CROSS - SECTION 3



BORROW PIT
CONTROL STRUCTURE

RHT engineering

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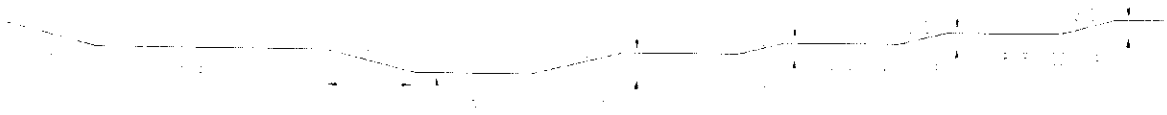
ROBERTS GROUP PROPERTY

CONCEPTUAL LAKE SECTIONS,
CONTROL STRUCTURE

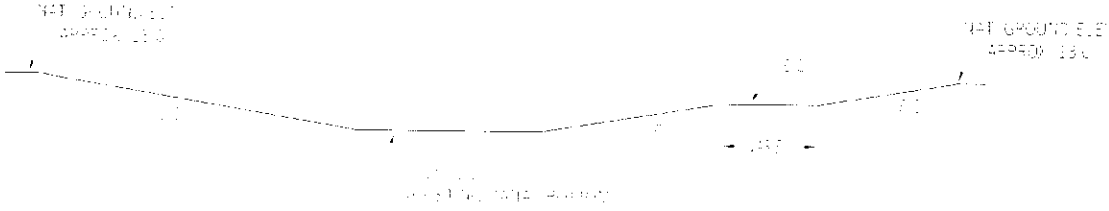
Client:
Q. GRADY MINOR, P.A.

S31 / T47S / R16E
LEE COUNTY

EXHIBIT B



PROPOSED KEHL CANAL SECTION
(ROBERTS PROPERTY)



KEHL CANAL SECTION 2
(COUNTY PROPERTY)

FISH TRAP

RHT engineering

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Lehigh Acres, FL 33972
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Engineering Certificate of Authorization # 25852

ROBERTS GROUP PROPERTY

CONCEPTUAL CANAL,
FISH TRAP SECTION

Client:
Q, GRADY MINOR, P.A.

S31 / T47S / R16E
LEE COUNTY

EXHIBIT C

Appendix F: Statement of Work for Exotic Control

Statement of Work
Pine Lake Preserve

Invasive Exotic Plant Removal from Entire Preserve
Including
Historic Imperial Riverbed
& Surrounding floodplain

A. Introduction

Lee County purchased the Pine Lake Preserve, located in southeast Bonita Springs, in late 2000 through its conservation lands program. The project site comprises the entire 131-acre Preserve.

The project includes management unit 1, 22.5 acres of mixed slash pine and cypress wetlands that have been impacted by invasive exotic plants such as melaleuca, Brazilian pepper, downy rosemyrtle, earleaf acacia and java plum, at less than 25% coverage. The historic Imperial Riverbed bisects this unit. Last year two berm cuts were created where the Kehl Canal and a farm road cut off water flow in this riverbed. During high water events water flowing through the Kehl Canal will now also flow through the historic riverbed. Large melaleuca trees have invaded the riverbed due to the complete absence of water flow since the construction of the Kehl Canal. The 9.3-acre management unit 2 contains between 0-25% melaleuca infestation within the pine flatwoods and hydric pine/cypress habitat and a thick hedgerow of Brazilian pepper on the east-west berm along that section of the Kelh Canal. The southern portion of unit 3 is a melaleuca monoculture or at least >75% infestation. The northern hydric cypress/pine area has a much lower infestation, <25%. The entire unit is 14.4 acres in size. Management unit 4, 23 acres, consists of the large borrow pit, associated lake banks, spoil area to the north and ditches. The land areas have a >75% exotic infestation. Management unit 5, 54 acres, is made up of mesic cypress/pine and pine flatwoods habitats and a spoil area. With the exception of the spoil area at the southeast corner of unit 5 and the row of Brazilian peppers north of the east-west road the remainder of the unit exhibits <25% exotic infestation. Management unit 6, 8.4 acres, is predominately pine flatwoods with some cypress and an exotic infestation <25%.

B. Objectives

The purpose of the project is to continue to restore water flow through the historic Imperial riverbed by removing the melaleuca, as well as remove all other invasive exotic trees and shrubs growing within the floodplain area associated with the riverbed. In addition, the objective of this project is to bring the entire

Preserve to a maintenance level for invasive exotic plants. Control efforts will involve mechanically removing melaleuca in the riverbed and all other areas of exotic infestation >50% coverage and hand cutting all invasive exotic trees and shrubs in areas of <25% infestation. Native plantings may need to be installed in certain areas with >50% exotic infestation but that will be a separate project, and will be planned once hydrologic restoration is complete; see Pine Lake Preserve Land Stewardship Plan for details.

This is a cost-share project with funding coming from the following sources:
- $125,000 available from SFWMD
- $25,700 available from C20/20 funds
- **$150,700 TOTAL project cost**

C. Scope of Work

Restoration work will be conducted throughout the entire Preserve (131 acres).

Work will commence in unit 4 north and west of the lake, where melaleuca and other exotics will be removed with an excavator type equipment, piled and burned. This will make room for piling exotics being pulled from other units such as the melaleuca to be removed from the riverbed in unit 1. The excavator will then move to unit 5, 3, 2, 6 and 1, in that order, piling and burning where appropriate.

The Brontosaurus, mulching type equipment, can be simultaneously working in the Preserve, starting in unit 5 then on to unit 2.

Handwork will consist of cutting invasive exotic shrub and tree stems, treating the stump and creating neat piles where necessary. Initial handwork will begin in unit 1, and then proceed to units 6, 5 and 3 in that order. It will be necessary to follow-up with chemical treatment 6 months to one year after all initial work, as described above, is complete, to control any new root sprouts or seed sprouts.

D. Work Breakdown Structure

2005

September thru October – handwork
October – Brontosaurus work
October thru November – excavator work

2006

Summer – Follow-up Herbicide treatment

Brontosaurus	
Approximate per acre cost	$2,100
Acres to clear with Brontosaurus	12.5
Mobilization fee and out-of-town expenses	$750
Total	**$27,000**

Excavator	
Approximate per acre cost (includes piling/burning)	$2,000
Acres to clear with excavator	26.7
Mobilization fee	$500
Total	**$53,900**

Handwork	
Approximate per acre cost (includes labor & materials)	$500
Acres to clear with handwork	80
Total	**$40,000**

Follow-up chemical treatment	
Approximate per acre cost (includes labor & materials)	$250
Acres to clear with handwork	119.2
Total	**$29,800**

TOTAL project cost - $150,700

Appendix G: Projected Costs and Funding Sources

Appendix G - Projected Costs and Funding Sources Table

Structures and Improvements

Item	Possible Funding Source	Estimated Costs
Wildlife Viewing Benches	C20/20	$1,200
Native Plantings		$1,000
Walk-thru for public use		$150
Clearing New Trails		volunteer/in-house

Resource Enhancement and Protection

Item	Possible Funding Source	Estimated Costs
Invasive Exotic Plant Control	SFWMD and C20/20	$150,700
Filling Ditch 1		$2,000
Plugging Ditch 2		$1,000
Borrow Pit and Kehl Canal Enhancement	Floodplain compensation	$581,625
Fuel Reduction	C20/20	$1,700
Fence Repair		$500

Signage

Item	Possible Funding Source	Estimated Costs
Informational Kiosk	YMCA	$3,000
Educational Signs	C20/20	$5,000
Boundary Signs		$200
Directional Sign		$60

TOTAL COST ESTIMATE **$745,725**

Site Management and Maintenance

Item	Possible Funding Source	Estimated Costs
Exotic Plant Control	C20/20	$26,000
Prescribed Fire Regime		In-house
Fence Repairs		$500

Yearly Maintenance Estimate **$26,500**